UNIVERSITY OF KWAZULU-NATAL

Adoption and Utilisation of e-Government Systems by Citizens in SADC: the case of Zambia and Zimbabwe

By

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Declaration

I, Mr **WILLARD MUNYOKA**, declare as follows:

1. That the work described in this thesis has not been submitted to UKZN or other tertiary institution for the purposes of obtaining an academic qualification, whether by myself or any other party.
2. That my contribution to the project was as follows:
   Carrying out the entire research from inception to completion, covering research proposal write up, the design of data collection instruments, data collection and analysis (for both quantitative and qualitative), final chapter write up and article writing.
3. That there were no authorship contributions of others to this research.
4. That some of the contents of this thesis have been published as follows:

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— **Ralph Waldo Emerson.**

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Dedication

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Abstract

Electronic government (e-Government) offers great opportunities for transforming the public service delivery systems by providing an effective, efficient and transparent tool for facilitating the active participation of citizens in government decision making processes and for achieving good governance. However, the success of e-government is not entirely dependent on the provision of excellent e-government systems (supply-driven), but also on other factors like system acceptance and utilisation by citizens. Whilst the United Nations e-Government Surveys have demonstrated the proliferation of e-government initiatives in both developed and developing countries, the implementation, adoption and utilisation of such systems in developing nations is constantly affected by many challenges. Many citizens are hesitant to adopt and use e-government systems for various reasons and in some cases, such decisions are indeed merited. Citizens' awareness, technical aptitude, confidence and trust in the government and its e-government systems are salient factors that are impacting the acceptance and utilisation of such systems. Similarly, practitioners (decision and policy makers, designers and implementers) of e-government have noted that most of the challenges being encountered by citizens are distinctively pertinent to national and regional socio-economic, cultural, political, and technological circumstances, and thus require a contextual and holistic approach for solutions.

This study is driven by the quest to examine and establish the fundamental factors that are affecting citizens' capacity, effort and behavioural intentions to adopt and continue using e-government systems in the Southern African Development Community (SADC) region; using Zimbabwe and Zambia as a case study. Thus, this study focuses on the government to citizen (G2C) domain with particular emphasis on the citizen-side. Currently, there are no holistic, people-driven models that could be used to assist and guide practitioners on e-government maters (including guiding citizen-informed designs and implementation, predicting and stimulating adoption and utilisation) for the SADC region and other developing nations with similar socio-economic and technological settings. This study aims to develop a people-driven e-government adoption and utilisation model (PDEGAUM), build upon two long-established theoretical frameworks; the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) (focused on understanding the demand-side) and the ITU E-Government

Implementation Toolkit (focused on understanding how the supply-side could be aligned with, and be informed by, the demand-side).

An explanatory sequential mixed methods approach was considered most appropriate for testing the PDEGAUM conceptual model. Multistage sampling techniques were used to select the 800 respondents (drawn from Zimbabwe and Zambia) for the survey method (self-administered questionnaires were used). After the pre-analysis screening of the quantitative data, only 736 questionnaires were used for data analysis (comprised of 489 citizens who have used e-government systems and 247 have not used). Explanatory Factor Analysis (EFA) and regression analysis (using IBM Statistical Package for the Social Sciences (SPSS)); and structural equation modelling (SEM) and Confirmatory Factor Analysis (CFA) (using IBM Analysis of Moment Structures (AMOS)) were selected for testing the model fit of the proposed model. All but one of the hypotheses was confirmed by this study. Semi-structured interviews (serving a confirmatory role) were pursued with 8 purposively selected interviewees from the respondents who had participated earlier on in the survey. The Total Quality Framework (TQF) was adopted as the most suitable theoretical lens for guiding the analysis of the qualitative data; thematically using the Nvivo Plus qualitative data analysis software (QDAS). The qualitative results confirmed the quantitative results.

Findings of this study confirm the proposed PDEGAUM model as being suitable for the SADC region. The PDEGAUM model is novel in that it places citizens' demands and input at the centre stage of spearheading e-government initiatives, which in turn informs e-government implementation. This approach contradicts the supply-driven approach by being contextually-aware of citizens' concerns in-line with e-government initiatives. Such a holistic gesture by the government is believed to go a long way in fostering and stimulating the adoption and utilisation of e-government systems. Decisively, the findings of this study have demonstrated that a people-driven approach constitutes the basis for rolling-out successful e-government systems, particularly in the context of the SADC region and other developing countries that are plagued by complicated socio-economic and political dynamics.

Keywords

E-Government Systems; adoption; utilisation; conceptual model; people-driven; supply-driven; implementation; G2C; SADC

Acronyms

Acronym	Technological Meaning
AGFI	Adjusted-Goodness-of-Fit Index
AMOS	Analysis of Moment Structures
AVF	Average Variance Factor
BAZ	Broadcasting Authority of Zimbabwe
BI	Behavioural Intention
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CL	Construct Reliability
CMB	Common Method Bias
CMID/DF	Chi-Square over degrees-of-freedom
CMV	Common Method Variance
COMESA	Common Market for Eastern and Southern Africa
CSO	Civil Society Organisations
Df	Degree of Freedom
DV	Discriminant Validity
EA	e-Government Awareness
e-Business	Electronic Business
e-Commerce	Electronic Commerce
ECT	Electronic Communications and Transactions
EE	Effort Expectancy
EFA	Explanatory Factor Analysis
EGDI	Electronic Government Development Index
e-Gov	Electronic Government or e-Government
e-Government	Electronic Government
e-Health	Electronic Health
e-Learning	Electronic Learning
EPI	Electronic Participation Index
e-Readiness	Electronic Readiness
FA	Factor Analysis
FAQs	Frequently Asked Questions
FC	Facilitating Condition
G2B	Government to Business
G2C	Government to Citizen
G2E	Government to Employees
G2G	Government to Government
GDP	Gross Domestic Product
GFI	Goodness-of-Fit Index
GISP	Government Internet Service Provider
GNU	Government of National Unit
GoZ	Government of Zimbabwe
HCI	Human Capital Index
ICR	Internal Consistency Reliability
ICT	Information and Communication Technologies
ICT4D	Information and Communication Technologies for Development
IDI	ICT Development Index

IDT	Innovation Diffusion Theory
IEEE	Institute of Electrical and Electronics Engineers
IFI	Index-of-Fit
IQ	Information Quality
IS	Information Systems
ITU	International Telecommunications Union
KMO	Kaiser-Meyer-Olkin
LAN	Local Area Network
MC	Multivariate Cloud
mc-Gov	Multivariate Cloud/Ultramodern Government
MDGs	Millennium Development Goals
m-Gov	Mobile Government
MICT	Ministry of Information Communication Technology
MPCU	Model of PC Utilisation
m-Services	Mobile Services
MSTD	Ministry of Science and Technology Development
NFI	Normed-Fit Index
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
OSI	Online Service Index
PDEGAUM	People-Driven E-Government Adoption and Utilisation Model
PE	Performance Expectancy
PEoU	Perceived Ease of Use
PFA	Principal Factor Analysis
POTRAZ	Postal and Telecommunications Regulatory Authority of Zimbabwe
PST	Privacy, Security and Trust
PU	Perceived Usefulness
PV	Price Value
QDAS	Qualitative Data Analysis Software
R^2	Coefficient of Determination
RMSEA	Root-Mean-Square-Error of Approximation
SADC	Southern African Development Community
SCT	Social Cognitive Theory
SDGs	Sustainable Development Goals
SEM	Structural Equation Modelling
SFL	Standardised Factor Loadings
SI	Social Influence
Sig.	Significance Level
SIH	Social Influence and Habits
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
SQ	System Quality
SQI	Service Quality and Information
SRW	Standardized Regression Weights
SWOT	Strengths Weaknesses Opportunities and Threats
TAM	Technology Acceptance Model
TAM2	Extended Technology Acceptance Model
TII	Telecommunication Infrastructure Development
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behaviour

TQF	Total Quality Framework
TRA	Theory of Reasoned Action
UKZN	University of KwaZulu-Natal
UN	United Nations
UNCAC	United Nations Convention against Corruption
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
USE	Use Behaviour
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Extended Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
WGI	World Governance Indicators
WI-FI	Wireless Fidelity / Wireless Internet
WSIS	World Summits on Information Society
χ^2	Chi Square
ZAMSTATS	Zambia Central Statistical Office
ZAMTEL	Zambia Telecommunications Company
ZARNET	Zimbabwe Academic and Research Network
ZICTA	Zambia Information and Communications Technology Authority
ZIMSTATS	Zimbabwe National Statistics Agency
ZNFU	Zambia National Farmers Union
ZRDC	Zambian Research and Development Centre

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Chapter 1: Introduction

"A popular government without popular information or the means of acquiring it is but a prologue to Farce or Tragedy or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors must arm themselves with the power knowledge gives."

— **James Madison.**

1.0 Introduction

This chapter provides a detailed background, problem statement and motivation for the study. Moreover, this chapter presents pertinent issues that will foster an in-depth understanding of the factors that are confronting governments' implementation efforts of e-government systems and their subsequent adoption and utilisation by citizens in the SADC region.

1.1 Background

Governments across the world are acknowledging the need for modernisation and good governance by embracing Information and Communication Technologies (ICTs). According to UNESCAP (2009), good governance involves the engagement of government agencies, the civil society, pressure groups and any other stakeholders in decision-making and decision-implementation processes, in a participatory, consensus-building and responsible manner. Traditionally, governments in most developing countries have long been perceived by civil society as a giant, complex bureaucratic institutions working within rigid silos creating barriers to information and service access (Ruhode, 2013). However, the universal growth of the knowledge economy has led governments to acknowledge the need for adopting ICTs as a 'game changer' for achieving good governance.

The scope for the implementation and adoption of e-government initiatives varies widely subject to governments' socio-political agenda (Albesher, 2015). Moreover, current research (United Nations, 2016; West, 2015) has established that developed economies have benefited immensely by implementing e-government initiatives, while developing economies continue to be confronted with a host of overarching challenges militating against successful e-government implementation. Progressive governments acknowledge the need for participatory, citizen-centric decision-making to overcome bureaucratic silos, thus improving service delivery (Urbina & Abe, 2017; Sorn-in et al., 2015; Ruhode, 2013). This has spurred the acceptance, utilisation, and success of e-government initiatives in the developed world since citizens feel that they are key stakeholders with a valuable contribution to the project. In such cases, e-government systems have evolved from the mere information or emerging (offering static content) model to the connected and transformation maturity model (citizen-centric e-Gov that solicits for opinions and input towards decision-making processes before policy implementation). Against this background, governments in the SADC region (the focus of this study) cannot allow ignoring citizens' demands for better and more efficient 24/7 government services. The widely adopted 'supply-driven' rationale for rolling out e-government systems by most developing countries has been characterised by low levels of acceptance and utilisation by citizens (OECD, 2013). Hence there is a necessity for re-engineering processes by finding a balance between a demand-driven and supply-driven e-government agenda.

This study pursues a deeper understanding of factors impacting SADC citizens' efforts and desires to adopt and use e-government systems and to continue to use them. Thus, this study is rooted in the government-to-citizens (G2C) domain, with a particular vested interest in the 'citizen' side of the G2C domain. Many scholars (Bwalya & Mutula, 2016, Munyoka & Maharaj, 2016; Bwalya, 2014; Addalla, 2012; Nour et al., 2008) have established that e-government solutions should match the context (alignment of the target goals with stakeholders' needs and challenges, socioeconomic and political environment) in which they are applied, thus minimising failure. The researcher argues that there are limited frameworks and models that take into cognisance the interplay of demand-driven and supply-driven e-government initiatives for better understanding the dynamics, vital issues and factors that are affecting the implementation, adoption and utilisation of e-government systems in the SADC region.

Analysis of the progress made in e-government implementation in the SADC region in 2016 relative to other regions of the world (see Table 2-5) reveals stifled and scant progress (United Nations, 2016). The E-Government Development Index (EGDI) measure is used to evaluate the progress made in e-government adoption (by assessing the telecommunications infrastructure, human capital development, online services and e-participation) for a country relative to other United Nations member states. A critical analysis of the progress made by the fifteen SADC countries reveals that only Mauritius (0.6231), Seychelles (0.5181) and South Africa (0.5546) had EGDI scores above the World Average (0.4922) score; whilst Botswana (0.4531) and Namibia (0.3682) scored above the average score for developing nations (0.3591) (United Nations, 2016). Such findings uphold the assertions raised by Ramtohul and Soyjaudah, (2016) that most e-government projects in SADC countries are not performing well due to numerous challenges confronting both the government and citizens. Several scholars (Bwalya, 2017; Mawela et al., 2017; Nkohkwo, 2013; Hafkin, 2009) cite the lack of suitable frameworks to guide the decision making and implementation process, poor funding, inadequate ICT infrastructure, lack of citizen consultation and involvement in e-government matters as major challenges frustrating e-government implementation and adoption efforts. On the consumer side of e-government, focused on the adoption and utilisation of e-services by citizens, numerous inhibiting factors were echoed (digital divide, lack of awareness, lack of suitable technical skills to use the systems, lack of trust on the systems due to security concerns, lack of support and assistance to users whilst interacting with the systems, high costs of data bundles needed to access the internet and e-government) in many contemporary studies (Otieno & Omwenga, 2016; Munyoka & Maharaj, 2017; Bwalya & Mutula, 2016).

Moreover, the corpus of literature has confirmed a worrisome and "ever-widening gap between e-government implementation and adoption" which has culminated in low acceptance and utilization levels, and "poor return on investment" for most governments (Al-Shafi, 2009:2). Considering the aforementioned factors, the researcher argues that there is an imminent need for solutions, either in the form of a proposed framework or model that could be used for guiding policy- and decision-makers and practitioners on e-government matters to overcome these challenges. Similarly, there is scant evidence of studies on e-government, in the context of the SADC region that has taken an all-inclusive approach to merge people-driven and supply-driven initiatives as central themes aimed at stimulating and broadening the acceptance and utilisation of such systems by citizens.

This study is aimed at closing this research gap by adapting the UTAUT2 and ITU e-Government Implementation Toolkit models to advance a hybrid People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model. Chapter 2 (Literature Review) and Chapter 3 (Analysis of Existing e-Government Adoption Models) are dedicated to discussing the above-mentioned issues in light of the challenges and the progress made in e-government in the SADC region.

1.2 Motivation and Research Problem Statement for the study

The paradox of e-government adoption, implementation, and utilisation in the SADC region remains complicated and multifaceted. Subsequently, this dilemma could be attributed to the fact that most e-government solutions in the G2C domain are founded on a 'triangular sort of' relationships among government entities, citizens, and technology (Al Khatib, 2013). Therefore, the success of any e-government initiative depends to a larger extent on the interplay of these three factors. Similarly, Information and Communications Technologies (ICTs) have radically modernised the way governments the world over offer their services to and interact with their citizens, with the business world, and with its own employees. However, the predicament that is confronting practitioners on e-government matters in most developing countries is that of paying greater attention to how ICTs could address governance problems (silos of supply-driven e-government solutions) whilst paying little attention to citizens' preferences and expectations (Mawela, Ochara & Twinomurinzi, 2017; World Bank, 2011). Yet in reality, argues Schuppan (2009), technological solutions (under the auspices of e-government) should be driven by the quest for progressing citizens' lives by offering them high-quality, value-added, efficient and effective service delivery that meet their needs.

Accordingly, the concept of e-government emanated from industrialised countries, where some successes were reported (United Nations, 2016; OECD, 2013; Mutula, 2008). However, Al Khatib (2013) suggests that it is inappropriate to assume that successes realised by implementing e-government systems in developed countries can be automatically replicated in developing nations.

It is apparent that the implementation and adoption of e-government in developing nations requires, even more, consernted effort from all stakeholders (citizens included) and resources;

given the volatility of the economic, political and social situations engulfing most countries. Several scholars have studied the implementation and adoption of e-government systems in the SADC region and reported suboptimal levels of adoption by citizens (Bwalya & Mutula, 2014; Nkwe, 2012; Bwalya & Healy, 2010) and high failure propensity of the projects which do not meet their primary goals (Mpinganjira, 2013; Nkohkwo & Islam, 2013). Elsewhere, Bwalya (2017) studied the efforts by countries in sub-Saharan Africa to stimulate the adoption and utilisation of e-government systems by citizens and established that some efforts are being made by government agencies to create awareness of the existing systems (supply-driven). However, Bwalya (2017) concluded that governments' efforts in creating awareness amongst citizens are not necessarily translating into widespread acceptance and utilisation of such systems. Elsewhere, Mawela et al. (2017) posit that despite governments' efforts in creating awareness of e-government systems, functional literacy of ICTs and e-government systems remains very low across the majority of citizens in Africa. Furthermore, Mohamed (2015) noted that the digital divide, system acceptance, and utilisation divide are high and a major stumbling-block to the proliferation of e-government in Africa. Still, more needs to be done by the governments to assist and convince citizens to improve their ICT skills and adopt and use e-government systems in the region.

The majority of developing countries are pushing government services online for access and use by citizens without engaging them as stakeholders (to buy-in their ideas and input) on e-government matters before system implementation. This approach (supply-driven) would work well and realise its goals if the adoption and utilisation of e-government systems were compulsory for all citizens. Nevertheless, most e-government systems in the SADC region are optional for use by citizens and this creates complications in determining and establishing services that are wanted by citizens. Consequently, a study done by Alshehri (2012) in Saudi Arabia revealed that more than 55% of participants were unhappy with the supply-driven e-government services they were receiving from the government. The concept of 'people-driven' (Munyoka & Maharaj, 2017; United Nations, 2016) and 'citizen-centric' (Mulung & Rosun, 2017) e-government initiatives seems not to be embraced by the majority of SADC member states – hence, the root cause for most failing e-government systems.

People-driven and citizen-centric e-government initiatives entail placing citizens' input, desires and needs (in line with e-government) at the centre stage of steering and informing the rollout of e-government systems. In light of the much promising implementation of online systems (e-

Commerce) in the private sector of most SADC member states, citizens anticipate better services from the government and often tend to compare the public service system with the private sector (Al Khatib, 2013). Moreover, a holistic approach (espousing demand-driven and supply-driven inputs) for spearheading e-government initiatives in the SADC region are some of the plausible solutions required for overcoming the numerous challenges that are confronting most e-government projects. Similarly, in line with the existing (supply-driven) e-government systems, governments in the SADC region needs to know which factors are affecting citizens' decisions and capacity to adopt and use such systems in order to come up with solutions.

Over and above the aforementioned challenges, several scholars (Bwalya, 2017; Otieno & Omwenga, 2016; Alateyah et al. 2014) have cited numerous issues (the lack of facilitating conditions like information centres at community level to assist citizens, unallowable ICT devices with access to the internet, high price of internet data bundles, perceived ease of use of the e-government systems, perceived lack of system security) that are frustrating citizens' intentions and capacity to adopt and use e-government systems in most developing countries. Considering the diversity of the aforementioned factors, it is apparent that the adoption of a holistic approach to addressing these challenges in the SADC region is desirable.

While most SADC countries have comprehensive ICT policies in place, several scholars (Ruhode, 2016; Munyoka & Manzira, 2013; Nkohkwo & Islam, 2013) have nevertheless alluded to challenges with the implementation, adoption and continued utilisation of e-government systems due to the absence of comprehensive frameworks and models for guiding practitioners.

1.2.1 Problem Statement

Despite all the efforts made in implementing e-government systems in SADC countries, the adoption and utilisation of such systems by citizens remains challenging and suboptimal. This study uses Zambia and Zimbabwe as a case study. The rationale for selecting these two countries are established on the following grounds: constrained financial resources to cover many SADC countries, both countries have some evidence of e-government implemented and the time constraint in which this study had to be completed. Substantial financial resources, time and effort continue to be dedicated to ensuring that e-government initiatives are successful

in the region. Therefore, it will be plausible to investigate the factors that are affecting citizens' capacity, intentions and effort to adopt and utilise such systems. Similarly, an in-depth understanding of how governments are enacting policies on rolling out e-government systems and state mechanisms put in place to aid citizens' adoption and utilisation of such systems would provide a holistic understanding of e-government initiatives in the SADC region. Moreover, this would provide invaluable information and understanding of the success and failure factors of e-government initiatives to governments so that corrective actions could be undertaken to stimulate the proliferation of such systems among citizens.

Thus, the research problem can be stated as:

To identify major salient factors that are affecting citizens' efforts, intents and capacity to adopt and use e-government systems and,

To establish how governments can roll out e-government systems that can be accepted and used by citizens as the primary mode of accessing government services and for actively collaborating with government agencies.

The following research sub-questions have been formulated to assist in achieving the aim of this study:

1. What e-government initiatives are in place to enhance access to government service by citizens in Zambia and Zimbabwe?
2. What are the main factors affecting the adoption and utilisation of e-government systems by citizens in Zambia and Zimbabwe?
3. How can assessment of the adoption and utilisation of e-government systems be made?
4. How can the identified salient factors be used to construct a holistic conceptual model for stimulating and guiding the adoption and utilisation of e-government systems by citizens in Zambia and Zimbabwe?

1.3 Research Aim and Objectives

The aim of this study is to develop a People-Driven e-Government Adoption and Utilisation conceptual model that takes into account all the crucial factors that are affecting the adoption and utilisation of e-government systems by citizens in the SADC region. Such a conceptual model shall be used as a tool for guiding e-government policy makers in national development strategies and decision-making process for effective e-government adoption and utilisation in

the public sector of SADC member states and other developing countries experiencing similar socioeconomic conditions. To fulfil this aim, the following research objectives have been formulated:

1. To undertake a comprehensive literature review aimed at gaining an in-depth understanding of the progress made in e-government.
2. To identify and evaluate relevant models and frameworks available for assessing e-government adoption and utilisation and their suitability to the SADC region.
3. To formulate a people-driven e-government adoption and utilisation conceptual model that captures all the salient factors affecting citizens' decisions to adopt and use e-government systems.
4. To empirically examine the fundamental factors and challenges affecting e-government systems adoption and utilisation by citizens and propose potential solutions.
5. To revise the proposed conceptual model based on empirical findings and formulate some recommendations focused on addressing the identified research gaps existing between the research fraternity and the actual e-government adoption and utilisation levels by citizens in the SADC region.
6. To delineate the theoretical, contextual, empirical and substantive (practical) implications of the results in order to advance the adoption and utilisation of e-government systems in the SADC region.

1.4 Research Methods Adopted

This study adopts an explanatory sequential mixed methods research approach; which involves the execution of the hypothetico-deductive approach in the first stage followed by interviews in the second phase. Therefore, it falls under the pragmatist research philosophy underpinned by mixed methods design (Creswell, 2014). To achieve the aim of this study, a combination of the survey and case study research designs were found ideal, in-line with the adopted explanatory sequential research approach.

Specifically, the quantitative survey design was used in the first phase of this study to gather and analyse quantitative data using self-administered questionnaires from 800 participants constituted of both users and non-users of e-government systems. A multi-stage sampling

technique was employed to find the 800 participants. The quantitative data analysis formed the major component of data analysis and comprised of three major sub-sections: section (a) focuses on the descriptive statistics, section (b) covering Explanatory Factor Analysis (EFA) and regression analysis achieved using IBM Statistical Package for the Social Sciences (SPSS) version 23, and section (b) involving structural equation modelling (SEM) and Confirmatory Factor Analysis (CFA) using IBM Analysis of Moment Structures (AMOS) version 24.

Conforming to the case study research design (second phase of data gathering and analysis), the researcher administered semi-structured interviews with 8 purposefully selected interviewees from the respondents who had participated earlier on in the quantitative survey of this study. This is in line with Creswell's (2014) recommendation that for the explanatory sequential mixed methods to be rigorous, the follow-up interviews should involve the same respondents that took part in the quantitative strand since the goal is to have an in-depth understanding and clarification of the quantitative findings.

To achieve and maximise the credibility of the qualitative data, the accuracy of the analysis, findings, and trustworthiness of the overall procedures applied in this study, the Total Quality Framework (TQF) (Roller & Lavrakas, 2015) was adopted as a theoretical basis. The selection of the TQF for this study is justified on the grounds that it is the only framework that integrates the "design features that maximize the credibility of the data they gather, the accuracy of the analyses they conduct, and the usefulness of the outcomes" for the readers (Roller & Lavrakas, 2015: vi).
Moreover, Nvivo Plus version 11 QDAS package was used to analyse the qualitative data because it provides a wider range of essential tools required to handle rich qualitative data records using the established themes.

1.5 Scope of the Study

This research examines factors that are affecting the adoption and utilisation of e-government systems by citizens in the SADC region, using Zambia and Zimbabwe as a case study. The focus of this research is in the Government-to-Citizen (G2C) domain, paying particular attention to the 'citizen'-side of the G2C domain. The 'government'-side of the G2C domain is only informed by the critical factors (affecting citizen's adoption and utilisation), and thus, out of the scope of this study in terms of data collection and validation. This study argues that

by establishing the enablers and inhibitors of e-government adoption and utilisation, from citizens' perspectives and lived experiences, practitioners (policy and decision makers and implementers) in government will be in a better position to bridge the gap between e-government supply and e-government adoption and utilisation. Moreover, a holistic assessment (integrating the Extended Theory of Acceptance and Use of Technology (UTAUT2) and the ITU e-Government Implementation Toolkit as a theoretical lens) of the factors affecting the adoption and utilisation of e-government systems cannot be accomplished without the accurate understanding of the context in with such systems are implemented. Therefore, for the successful adoption and utilisation of e-government systems, it is paramount for the SADC countries to have a broader understanding of factors that are pertinent at national and regional levels, and this study aims to bridge that research gap.

A multi-methods research approach (exploiting both quantitative and qualitative techniques) to explore factors affecting citizens' intentions to adopt and the actual utilisation of e-government systems in the SADC region is used. A survey questionnaire (quantitative method) was administered across the two countries to gather data on citizens' views, behavioural intention and use behaviour towards e-government systems. To complement, confirm and gain an in-depth understanding of issues raised by citizens in the quantitative findings, semi-structured interviews for the case study (qualitative method) were undertaken using participants who had previously participated in the quantitative data gathering process. Therefore, the mixing of quantitative and qualitative methods was carried out for strengthening the findings using triangulation (Creswell, 2014).

1.6 Significance of the Study

This study probes a pertinent contemporary theme (regarding the adoption and utilisation of e-government systems) amongst the 21st-century scholars, politicians, practitioners (decision and policy makers, and implementers) and professionals in developing nations. In-line with the SADC region (the focus of this study), the United Nations e-Government Survey (2016) reports that out of the fifteen member states, only three countries (Mauritius, Seychelles and South Africa) have achieved an EGDI above the world and developing nations averages. Similarly, the same survey shows that only three nations (Mauritius, Tanzania and South Africa) have achieved an E-Participation Index (EPI) (a measure of online services provision by government

and its utilisation by citizens) above both the developing countries (0.3718) and world average (0.4625) indexes for the 2014 to 2016 survey period. This shows that the majority of SADC countries are facing numerous challenges in their endeavours to advance the rollout of e-government systems and to persuade citizens to adopt and use such services.

Considering the aforementioned problem statement for this study and the dilemma regarding the imbalance between e-government investment (EGDI) and low acceptance and utilisation (EPI), this study is timely as its results and conclusions provide essential pointers and triggers for practitioners on e-government matters to focus their attention and efforts in decision making and implementation. Specifically, the significant contributions of this study to the area of e-government in the context of the SADC region and other developing nations can be appreciated as follows:

1. Identifying the cause of the gaps existing between supply-driven e-government initiatives and citizens' anticipations and needs in-line with e-government systems (demand-driven systems). As indicated above, governments in the SADC region want viable solutions to overcome the low acceptance, adoption, and utilisation of e-government systems by citizens.
2. Identification of the fundamental factors that are affecting citizens' decisions and capacity to adopt and utilise e-government systems. This study posits that by knowing and understanding the pertinent factors that are affecting citizens' efforts to adopt and use e-government systems, governments will be in a better position to address their weaknesses and meet citizens' demands.
3. Proposing a people-driven e-government adoption and utilisation conceptual model (in Chapters 3 and 8) that could be used as a tool by decision and policy makers to guide the implementation of e-government systems. Moreover, the same model could be used in the re-engineering process (in-line with citizens' demands) of existing e-government systems (supply-driven) in order to stimulate their acceptance and utilisation by citizens. Such empirically tested frameworks and models are lacking in the context of the SADC region.
4. This research adds meaningfully to knowledge in the field of e-government by providing a novel basis for spearheading and stimulating the uptake of e-government systems. This is a paradigm shift from the traditional supply-driven e-government systems; it is more pragmatic, putting the external stakeholders (in the context of this study, citizens) and factors at the centre stage of e-government

initiatives, thus being contextually focused by addressing citizens' needs through online systems.

1.7 Thesis Structure Overview

This thesis adopts the four-stage structure and methodology suggested by Phillips and Pugh (2010) for carrying out any PhD study. The four stages cover the background theory, the focal theory, the data theory, and novel contributions to the study. Phillips and Pugh (2010) posit that the specific chapters of the thesis should then fall into these four broad categories, depending on their focus and contribution to the phenomena under investigation.

The background theory phase establishes the problem domain based on the corpus of literature and in the context of this study it was accomplished through Chapter 2 (Literature Review). The second phase (Focal Theory) builds on the background theory phase to advance a novel conceptual model for the study. In this study, this was achieved through Chapter 3, in which an in-depth analysis of the existing models for evaluating e-government adoption and implementation was done. The third phase (Data Theory) is a fundamental pillar of any research that identifies the most suitable research paradigm, design, approach, methods and laying out clear protocols for gathering and analysing data for the study. In this study, the data theory phase was accomplished in two phases (see Figure 1-1), firstly by clearly outlining the methodology for the study (Chapter 4) and by conducting data collection and analysis (Chapters 5, 6 and 7) in the second phase.

Novel Contributions (phase four) represent the innovative additions to the body of knowledge and practice made by the research. The novel contributions of this study are presented in Chapters 8 and 9.

The contents and sequence of the chapters of this thesis are summarised below.

Chapter One *(Introduction)*:

This chapter provides a synopsis of the research, clearly outlining the problem statement and the motivation for carrying out this study. The aim, objectives and research questions for the study and the adopted research methods are introduced. Moreover, the chapter underscores the importance of this study and its contributions to the body of knowledge and practice in the area

of e-government adoption and utilisation. Lastly, the chapter closes with an outline of the roadmap for executing the entire research.

Chapter Two *(Literature Review)*:

This chapter critically reviews the literature regarding the fundamentals of e-government initiatives. In particular, the chapter outlines the motivation for adopting e-government, e-government domains, and maturity models, barriers to e-government adoption and utilisation in developing countries, discussion of e-government trends around the world (comparing developed and developing nations). Additionally, the chapter critically analyses the progress made in e-government in Zimbabwe and Zambia. Finally, the chapter ends by performing a SWOT and Research Gaps analysis of the reviewed literature to establish the research gap for the study.

Chapter Three *(E-Government Adoption models, Conceptual Model and Hypotheses Development)*:

This chapter is dedicated to analysing the established models and frameworks available for evaluating and guiding e-government implementation by the government and, the adoption and utilisation by citizens; paying particular attention to their relevance to developing nations. Moreover, the discussion evaluates the models from two viewpoints, government side (supply-driven initiatives) and citizens' side (demand-driven initiatives) in order to establish the factors contributing to the gap existing amongst e-government implementation effort by government agencies and, adoption and utilisation of the systems by citizens. Such critique culminates in the people driven conceptual model (inspired by the UTAUT2 and the ITU e-Government Implementation Toolkit framework) proposed for guiding practitioners on stimulating e-government adoption and utilisation by citizens. In conclusion, the chapter proposes the research hypotheses for this study.

Chapter Four *(Research Methodology)*:

The methodology chapter (4) establishes the basis and procedures for carrying out the study. The discussion revolves around the selection and justification of the most suitable research paradigm, research design and research approach. The chapter also identifies the explanatory

sequential mixed methods as an ideal method for achieving the study goals and a rationale for the choice is presented. The data gathering methods, data analysis procedures, reliability, validity and trust are also discussed. Finally, the empirical research design flowchart illustrates the phases for carrying out the study in-line with the explanatory sequential mixed methods adopted.

Chapter Five *(Research Findings – Descriptive Analysis)*:

Chapter 5 presents the descriptive data analysis, giving the overview of the survey questionnaire, addressing data cleaning, normality, checks and screening procedures, variables development in the IBM SPSS QDS and analysis of the respondents' demographic statistics.

Chapter Six *(Advanced Statistics Result Analysis)*:

Chapter 6 presents the advanced statistics results covering measurement scale analysis, multicollinearity checks, reliability analysis using Cronbach's Alpha and validity analysis using Exploratory Factor Analysis (EFA). Regression analysis, Structural Equation Modelling and Confirmatory Factor Analysis (CFA) procedures are then pursued to evaluate the structural model fit of the PDEGAUM conceptual model proposed in Chapter 3. At this point, the salient constructs affecting e-government adoption and utilisation are established leading to the rejection or acceptance of the study hypotheses suggested in Chapter 3.

Chapter Seven *(Qualitative Analysis)*:

This chapter reports on the qualitative data analysis which provides a confirmation of the salient factors (established in Chapters 5 and 6) as having a significant influence on citizens' personal decisions and capacity to adopt and continuously utilise e-government systems. The Total Quality Framework was adopted in this study as a theoretical lens for generating, organising and interpreting the qualitative data.

Chapter Eight *(Discussion of the Findings)*:

Chapter 8 critically discusses the major findings of the study. Such discussion is done in-line with the proposed hypotheses, research questions, and objectives and in view of the research

aim of the study. A refinement of the PDEGAUM conceptual model that was proposed in Chapter 3 is presented.

Chapter Nine *(Conclusion, Contributions and Future Research)*:

Chapter 9 concludes this thesis by reflecting back on the research questions to establish and confirm the accomplishments. Specifically, the innovative contributions of the study (through the proposed PDEGAUM model and the salient factors identified), practical implications and contributions to knowledge in the area of e-government are presented. Besides, this chapter unveils the limitations of the study, personal reflection of the researcher in his PhD journey and recommendations for future research work.

Figure 1-1 illustrates the manner in which this whole research unfolds from inception to completion.

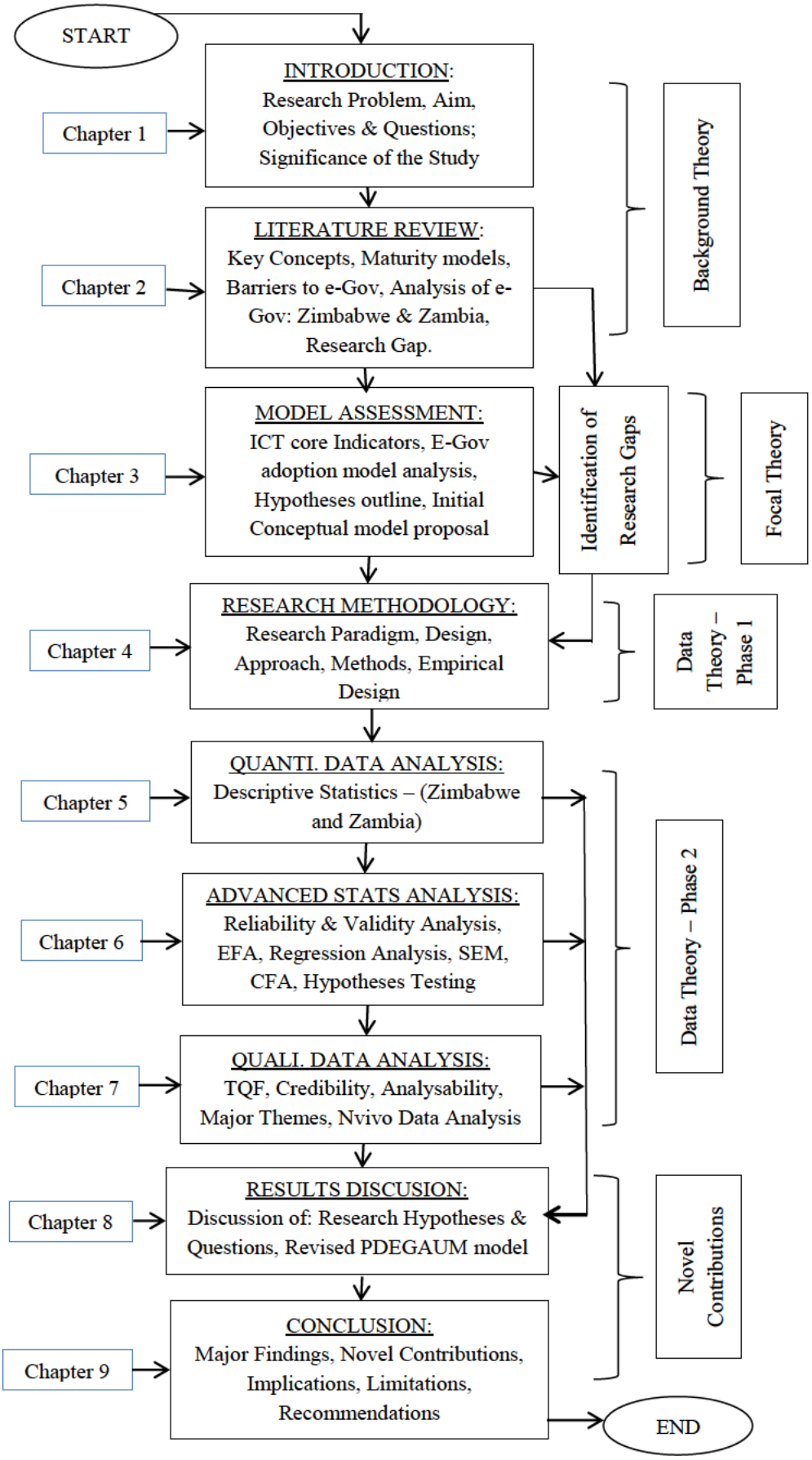


Figure 1- 1: Structure of the Thesis (Research Process)

1.8 Chapter Summary

This chapter introduces the research problem and outlines the structure of the thesis, thereby laying out a concise roadmap for accomplishing this empirical study.

The next chapter (2) critically reviews the existing literature on e-government practice, adoption, and utilisation internationally, concentrating on the SADC region and Zambia and Zimbabwe in particular.

Chapter 2: Literature Review

Chapter Overview

This chapter reviews the literature on e-government. Furthermore, the chapter demonstrates the trends of e-government adoption and utilisation across the world; with a particular focus on developing nations in Africa, the SADC region and finally in Zambia and Zimbabwe. The goal of the chapter is to discover progress made in e-government adoption, with a strong emphasis on evaluating the governments' efforts in ICT infrastructure building, ICT policy formulation and implementation, governance and outreach initiatives to educate the public to adopt and utilise e-government systems. The major sources of literature used in this chapter were government policy documents and other relevant publications, regional and international surveys and publications on the global, regional and national progress on e-government; and contemporary articles by scholars on e-government for the two countries. Google scholar, United Nations, World Bank, SADC, Zambia and Zimbabwe e-government websites provided the major source of the literature; though some critical documents were requested in person during the surveys from respective government offices in these two countries.

2.1 Motivation for E-Government

The day-to-day interaction of government with citizens, the business world and other governments is information intensive, thus generating a large amount of data to be processed, (Chatfield & AlAnazi, 2015). This information constitutes the basic ingredient required for governments to effectively govern, manage its resources, provide required services, and account for its performance (Heeks, 1999). Additionally, ITU (2008) suggest that information is an invaluable resource for empowering the citizens regarding public service delivery systems. Moreover, the smooth flow of information is essential for government-to-citizen (G2C) active engagement and for creating a knowledge society.

In this era of rapid technological advancement, governments across the world are confronted with the challenge of transformation, calling for innovative ways of civic engagement and

participation in decision-making processes for service delivery through e-participation (United Nations, 2016). The United Nations (2016) defines e-participation as the robust and critical involvement of citizens in governance matters through the use of ICTs. The United Nations General Assembly (2015) suggests that e-government encourages the accountability and transparency of government agencies resulting in better public service delivery.

Citizens and businesses expect the government to fulfil its public service delivery mandate using quality information. Information quality entails that governments put in place management systems and controls which guarantee accurate, relevant, complete, economical, verifiable, accessible, simple, and secure information. Likewise, since ICTs are the conduits through which e-government services are delivered, it is vital for governments to put in place stringent cybersecurity policies that guarantee secure transactions. The idea of harnessing ICTs into the public sector, in the broad context of e-government has attracted so much attention across the world by policymakers, politicians, researchers and individuals at national and international forums and summits to an extent that it was declared a global challenge at the World Summit on the Information Society (ITU, 2008).

However, the motives for embracing e-government vary immensely from developed to developing nations, public to private sectors; and from individual citizens to business organisations. Hence governments should not perceive e-government simply as the computerisation of its services; but as a re-engineering process seeking to align government service requirements and needs of the citizens (Heeks, 2003a). Countries in the SADC region have embraced e-government of some sort in their public service delivery systems with the motive to have a "competitive edge in the global economic value chain" (Bwalya & Healy, 2010: 23) and improve living conditions and e-participation of the general populace as stated in the United Nations Sustainable Development Goals (United Nations, 2016a).

2.2 E-Government Concept

The concept of e-government started in the mid-1990s when the former USA vice president AI Gore raised the idea of offering government services and information online (NICTA, 2014; Almarabeh et al. 2010). Government institutions are embracing e-participation systems (e-information, e-consultation, e-decision-making) to address the seventeen UN Sustainable Development Goals (SDGs) (United Nations, 2016a) to overcome abject poverty, fight inequality, injustice and promote inclusive societies (Chun et al. 2012; Van Niekerk, Pillay, &

Maharaj, 2011). As governments across the world embrace these concepts, some transformation in the way citizens and businesses envisage the operations of the public sector takes place (Abdalla, 2012).

Most government services in the developed world can now be accessed electronically by stakeholders (Aladwani, 2016) – thus revitalizing and positively impacting public service delivery systems by removing the unnecessary bureaucratic structures and high corruption (Mistry & Jalal, 2012). This transformational process is not all about extensive computerisation of government operations; but the sheer ability of governments to leverage e-government in order to bring developmental impacts to stakeholders as a result of effective utilisation of ICTs to solve societal problems (United Nations, 2016). However, in developing countries, not all government services can be accessed online due to many reasons like lack of access to and knowledge of the internet and financial constraints (Alateyah et al., 2014; Sharma et al., 2014). Moreover, the United Nations (2014), suggest that governments should try to strike a balance between the supply of e-government systems and stimulating the demand for such systems by citizens. This can be achieved by balancing the effort invested in e-government project development with effort dedicated to increasing demand by stakeholders. Other mechanisms include incorporating usability features such as personalisation, simplified portal interfaces, e-service usage checking, and provision of feedback to users and promotions for using e-government systems. Moreover, Davies (2015) suggests that governments must open up for dialogue and accepting initiatives from civil society and the corporate world on how to enhance e-participation.

When adopting the concept of e-government, decision-makers in government must recognise that technology does not exist in isolation; neither does it solve our contemporary problems (Khalil, 2014). It requires an understanding of the problems being faced by citizens and business and how best to adopt technology to address them; considering socio-cultural, legal and political contexts (ITU, 2008). For this to work efficiently, governments should shift from a citizen-centric model to people-driven e-government model (OECD, 2013). This new concept requires government entities to become more open when dealing with the critical, interconnected roles of all stakeholders related to government service delivery – thus allowing both citizens and businesses to be proactive in e-governance matters (OECD, 2013) and offering the required services using the most convenient communication channels. The uptake and impact of e-government services depend on the government's effective alignment, mixing

and integration of channels regarded most appropriate to particular service types and user-groups (United Nation, 2016).

The concept of e-government has similarities with e-Commerce in that all utilise the power of ICTs and Internet to deliver information, services, and products to their customers in an efficient, effective and transparent way.
Furthermore, both aim to cut time and expenses of doing business for customers as well as service providers; while realising high-quality service and customer loyalty. Nevertheless, there are some remarkable contrasts between e-Commerce and e-government; chiefly in market-targeting and segmentation. E-Commerce is used in the private sector, whilst e-government by government entities. E-Commerce adopts a commercial stance and aggressive marketing strategies in the desire to realise some profits; whereas e-government has to be provided in the best interests of the general citizens indiscriminately, often using constrained budgets. From an organisational perspective, private sector organisations are more flexible and responsive to supply and demand market forces; whilst bureaucracy is a domineering force in governmental organisations (Alshehri, 2012; Lin, Fofanah & Liang, 2011; Osman et al., 2014).

2.2.1 E-Government Domains

The European Commission (2012) defines a domain as a specific area of government service-focus targeted at the particular audience within a society; ordinary citizens, business sector, employees or government agencies. E-Government services are then tailor-made to suit the needs of each of these audiences; thus giving rise to different e-government domains. Almarabeh, Majdalawi, and Mohammad (2016) posit that the relationship between government and its e-service audience can be categorised into four broad categories: government to citizens (G2C), government to employees (G2E), government to government (G2G) and government to business (G2B). The majority of government e-services fall into one of these categories; thus giving the government a much better leverage to provide efficient and required services. The foci of each of these e-government domains are:

Government to Citizen (G2C) – the bulk of e-government service efforts are dedicated to this category through the provision of comprehensive one-stop web portals offering a wide range of online services to individuals. Typically, the South African government (www.gov.za) and

United Arab Emirates (www.government.ae/en) websites in the context of the developing world (United Nations, 2016). The ultimate goal of G2C is to enable efficient and convenient citizen interactivity with government and its agencies to access information, services and ask for clarity on government matters. If these services are efficiently tailor-made to the needs of citizens, there is a good possibility for G2C to overcome both time and geographical barriers, leading to improved citizen participation (Pina, Torres, & Royo, 2010; Rowley, 2011).
The United Nation E-Government Survey (2016) advised developing nations to devise effective mechanisms to overcome both the digital divide and e-government usage divide by first ensuring that ICT infrastructure, e-government intermediaries, and the internet are accessible and allowable to the general public. The researcher also noted that human capacity development in ICT-skills and education of citizens on the available e-government services are instrumental in determining the adoption and utilisation of e-services by citizens.

Government to Business (G2B) – the G2B e-service specialises in establishing efficient and quality online interaction between government entities and the business world. Just like in the G2C model, G2B aims to increase transparency and equality of doing business with all business players and this leads to the growth of small and medium enterprises, much needed for economic growth (Bouazza, Ardjouman & Abada, 2015; Abdullahi et al., 2015). G2B interactions and transactions are bidirectional; government-to-business and business-to-government and as such both stakeholders should play their roles to make G2B successful. Alsheri (2012) posits that if governments are to improve their efficiency in the G2B arena, they should build a strong business reputation and overcome unnecessary bureaucracy.

Government to Government (G2G) – the main focus of the G2G model is to enhance the efficiency and effectiveness of internal operations within government departments and its agencies. Furthermore, G2G aims to progress intergovernmental business operations by streamlining repetitive tasks and co-operation (Heeks, 2006); for instance, regulatory compliance. The efficacy among governmental agencies is improved through e-government by creating open databases for information and software sharing, through flexible skills infusion and transfer, (Susha, 2015). In this regard, it is evidenced that the G2G sector is the critical pillar that intertwines every level of governmental operations. However, in the context of developing nations, a lot should be done on back-office re-engineering processes for most governmental departments to achieve efficient G2G transactions.

Government to Employee (G2E) – G2E is concerned with strengthening the connection between government management, its agencies and employees using e-services. If all the other forms of e-government are to succeed; G2E should function perfectly first, since any internal resentment by government employees to adopt e-services will render ineffective any government initiatives (Albesher, 2015).
Therefore, governments should invest in the back-office re-engineering of processes, training of employees and government agencies to increase chances of e-service utilisation by external stakeholders (Weerakkody, 2012).

2.2.2 E-Government Maturity Models

E-Government maturity models are developmental tools that outline the various stages of technological sophistication (in terms of website features) and are used to guide the implementation, monitoring and benchmarking of e-government progress in a stage-wise fashion, from immature stage (provision of static websites) up to digital democracy phase (most advanced phase of e-government) for both developed and developing nations (UN Public Administration Programme, 2010). Drawing upon e-government literature, several maturity models have been advanced, ranging from three to six stages; discussing the level of sophistication of services offered through e-government websites. Out of the existing models, the UN e-Government Maturity model is the most comprehensive model, as it provides some measures for global data comparison on both website quality and online service indices for UN-member states.

In contrast, most of the existing maturity models do not provide such measures as website-quality and service index. In this regard, the UN maturity model posits that those nations whose e-government projects are ranked higher (within the transactional and connected phases) score higher on the web and online service indexes. Furthermore, various studies indicate that most developing nations are still in their early stages of maturity models, whilst developed nations are in the final phases of e-government development (ITU, 2008; United Nations e-Government Survey, 2014; Ifinedo & Singh, 2011). This gap is due to poor ICT infrastructure, lack of political will, poor e-readiness assessment and awareness campaigns, coupled with maladministration.

Given this background, Table 2-1 outlines some of the widely cited and used e-government maturity models.

Table 2- 1: Outline of the widely used e-Gov Maturity Models

Maturity Model	Number of Phases	Description of the Phases	Source
Gartner Group's model	1. Web Presence 2. Interaction 3. Transaction 4. Transformation	1. The website presents basic information for citizen access. 2. Improved interactive websites offering services like emails, downloadable forms, and search engines. 3. Permits performing online transactions, e.g. online renewal and payment of licenses. 4. Provides transformed government offering efficient, integrated, unified and personalised services.	(Baum & Maio, 2000)
Layne and Lee model	1. Cataloguing 2. Transaction 3. Vertical Integration 4. Horizontal Integration	1. Government creates a basic static website offering information and services. 2. Supports 2-way communication (transaction) between governments and users. 3. The focus is on an amalgamation of further systems and functionalities e.g. between local	(Layne & Lee, 2001) *(continues)*

		municipalities and central government. 4. Focuses on integrating government services for dissimilar functions into a one-stop portal for citizens.	
Howard's model	1. Publishing 2. Interacting 3. Transacting	1. The initial stage of e-Gov development concentrating on publishing information on government activities. 2. Enable simple user interactivity with government through emails, filling online forms. 3. Encourage citizens to perform simple online transactions.	Howard (2001)
Deloitte & Touches' model	1. Information Dissemination 2. Official two-way Transactions 3. Multi-purpose Portals 4. Clustering of common services 5. Full integration and enterprise transactions	1. Static websites are created for citizens to access government information. 2. Permits two-way interaction between users and government agencies. 3. A one-stop portal offers government information and services to users. 4. One-stop government portal allows customisation for users to meet unique service needs. 5. Government services and processes are well clustered	(Deloitte & Touche, 2001)

		to offer citizens a seamless service 6. Advanced, unified and unique allowing a personalised portal determined by user preferences	*(continues)*
Chandler and Emanuel's model	1. Information 2. Interaction 3. Transaction 4. Integration	1. The government offers most of its service information online on a static website. 2. Supports simple interactivity between citizens and government (search engines and emails). 3. Perform transactions such as e-filing. 4. One-stop service provision, allowing both horizontal and vertical integration of services across government units and its agencies	(Chandler & Emanuel,2002)
Chen's model	1. Information 2. Communication 3. Transaction 4. Transformation	Phases are similar to stages 1 -3 on Chandler and Emanuel's model, except in nomenclature. Offers transformed government services online, typically e-voting, e-democracy.	(Chen, 2002)
	1. Billboard 2. Partial service delivery	1. Comprised of the static website displaying information.	

West's model	3. Full integrated service delivery 4. Interactive democracy with public outreach and accountability	2. Websites offer limited e-services that include search facility. 3. All services and information are offered on a single government portal. 4. The e-portal provides fully integrated services like personalisation and feedback forms.	West (2004) *(continues)*
Public Sector Process Rebuilding model	1. Cultivation 2. Extension 3. Maturity 4. Revolution	1. Focuses on horizontal and vertical integration of services within government through the establishment of an intranet. 2. Internal government services concentrated online and allow for personalization of the web-interface by users. 3. Focus on accountability and transparency. 4. Open data access. Sharing data and software with vendors, customers, citizens and business partners. This model extends the Layne and Lee maturity model, with a greater focus on the customer, as opposed to technological proficiency.	(Andersen & Henriksen, 2006)
UN e-Gov maturity model	1. Emerging 2. Enhanced	1. In this phase, the government provides	

	3. Transactional 4. Connected	essential information and basic services like searching, FAQ and online help. 2. Improved online two-way communication services are offered to citizens, for instance, online application forms. 3. E-Gov system allows users advanced two-way communication with government. Typical e-services include e-voting, e-Tax-filling, renewal and application of licenses. 4. More sophisticated e-Gov system, which is citizen-centric in soliciting their opinions and input towards decision-making processes before policy implementation.	UN Public Administration Programme (2010) *(continues)*

E-Government maturity models provide a sound theoretical basis for understanding and progressing e-government adoption. Importantly, the UN e-Government Survey (2014) posits that the ever-changing ICT playing field, coupled with the complexity of citizens' service needs has nullified the linear approach to implementation and benchmarking. Likewise, as e-government transforms, modifications to current maturity models are inevitable to meet emerging challenges impeding e-government adoption, acceptance, and utilisation by citizens.

2.3 New direction for e-Government Adoption

The evolving role played by ICTs in transforming societies, cultures and economies the world-over has entered a new phase and governments are pushed to their limits in playing a catch-up game with realities (Accenture, 2014). The proliferation and popularity of digital devices coupled with access to the internet and social media amongst people from all walks of life in both developed and developing countries must be adopted for e-government services. Several studies (Deloitte, 2012; UN E-Government Survey, 2014; Klier, Pfleger & Thiel, 2015) suggest that governments can exploit the power of multi-channel service delivery to promote the adoption, utilisation of e-government systems. With this understanding, the 'e' in e-government can, therefore, be replaced with 'mc' (Multivariate-Cloud); leading to mc-Government dimension. In this context, mc-Government refers to 'multivariate-cloud (ultra-modern)-Government – a highly advanced, mutable and people-driven e-government service. Therefore, mc-Government becomes realistic and more relevant to address the current 'electronic-government', 'mobile-government' and 'cloud-government'; that is to cater for the dynamic episodes of harnessing ICTs in government service delivery to its diversified constituencies. In this model, the civil society's input determines the direction and composition of services to be offered through e-government.

In-line with contemporary findings, Waseda (2014) pre-empts possible future ICT channels and dimensions which governments should exploit to improve their service delivery to citizens. Furthermore, governments around the world are turning to business intelligence and analytic systems as a cost-saving approach and to help forecast e-government service demand by citizens prior to outreach and consultation programs and adoption (Chen, Chiang, & Storey, 2012). Similarly, the harnessing of multichannel options like social networking technologies, blogs, and forums give citizens the opportunity to voice their concerns on government decision making; but has led inevitably to overwhelming volumes of valuable unstructured data. Researchers have drawn attention to the fact that e-government adoption has fallen short of meeting user demands and recent studies posit that business analytics, big data, the web and text mining could provide some promise (Almarabeh, Majdalawi, & Mohammad, 2016; Rao & Dey, 2011; Chen, Chiang & Storey, 2012; Chaudhuri, Dayal, & Narasayya, 2011).

Other new dimensions to progress e-government adoption include harnessing the power of cloud-computing, open-government data, cyber-security, digital inclusion for ageing societies,

interoperability, and one-stop e-service, e-local-Government through kiosks; and proactive communication, consultation and citizen education (Accenture, 2014; Waseda, 2014). With constrained budgets, governments can exploit the benefits of cloud computing (Government-Cloud) to its advantage; namely scalability, robust security, improved reliability, high availability of services and better data synchronisation. Countries like Denmark, German and Singapore are leading the way on G-Cloud 'infrastructure-as-a-service' on a 'whole-of-government' basis (Kundra, 2011; Chou, 2015).

Open government data, big data, and cybersecurity issues are further avenues governments should pay attention to when exploring new ways for better e-service provision to citizens. These are not new concepts, but their practical exploitation within government services is still in its rudimentary phase (Almarabeh et al., 2016; Wyld, 2010). Provision of powerful analytical tools and big data can assist government agencies in processing large volumes of data for better decision making, greater policy transparency, accountability, forecasting of changing service demands by citizens and to increase derived social and economic benefits. Security concerns, cyber-security included, are the major issues that consistently restrict the smooth adoption of e-government by many governments and the one responsible for building or lowering people's trust in e-government. Security policies and legal frameworks should all be effective and functional. One-stop e-Government service and interoperability consist of integrated government service delivery accessed via one gateway portal by both citizens and organisations. Successful one-stop e-government portals have been adopted by governments of the United Arab Emirates, Singapore, Netherlands and Denmark (Waseda, 2014).

2.4 Benefits and barriers to e-Gov adoption and Utilisation

2.4.1 Benefits

In the realm of e-government, the benefits of adopting and utilising e-systems are well documented in the literature (Ponge, 2016; Alshehri, 2013; Hassan, 2011; Nkwe, 2012; Mutula, 2013). For both developed and developing nations, the power of using ICTs in governments lead to improved service delivery, improved efficiency and reduce operational costs. E-Government has got greater potential to resolve many of the public administration challenges

that engulf most developing nations in Africa (Schuppan, 2009). However, to make e-government adoption successful, governments need to align ICT implementation with developmental goals, taking into consideration technical, economic and social realities on the ground. Moreover, proper adoption is believed to yield sustainable economic development, "increase transparency, accountability, and democracy" (Abdalla, 2012: 29).

As evidenced in the Arab League, successful alignment of policies and citizens' needs with e-government adoption has led to better Gross Domestic Product (GDP), citizen satisfaction through e-participation; and trade and a budget surplus (UN e-Government Survey, 2014; Bin-Touq, 2015; Bilbao-Osorio, Dutta, & Lanvin, 2013). Mutula (2013) suggests that one of the main goals of e-government adoption is to provide public services to all constituencies (customers) in a more convenient, citizen-centric and economical manner. Due to the broad diversity of service needs by different categories of government customers, the benefits of e-government adoption are best outlined in-line with the above-mentioned domains, refer to Table 2-2.

Table 2- 2: Benefits of e-Government Adoption

E-Gov Domain	Potential Benefits	Evidence
G2C	• Savings in transport to government offices • Savings in time for accessing government services • Improved service delivery to citizens • Broader choice of channels for accessing government services • Greater citizen involvement in government policy and decision-making • Provision of sustainable economic development through projects	• In a study conducted by Chen and Zhang (2011) in China on e-government information and service utilisation, 62.9% agreed to have used G2C online services due to its efficiency. • Citizen satisfaction with the quality of e-government service in UAE shows that 33%

	• Citizen empowerment through access to public information • Offers other ground-breaking opportunities	were fairly satisfied and 34% very satisfied (Accenture, 2014).
G2B	• E-Procurement and e-Tendering benefits • Improved export and import turn-around time compliance with regulations • Reduced risks in business forecasting and planning • Enhanced efficacy and quality business transactions and communications	*(continues)* • UK government estimated cost savings of US$2.7–2.9 billion per year by conducting G2B transactions, (Accenture, 2014). • In a study conducted in Kisii Town in Kenya, 70% of the participants approved that e-procurement greatly improves government procurement leading to cost savings (Otieno, Muthoni & Simon, 2013).
G2G	• Improved administration efficacy • Increased employee throughput and productivity • Cost savings through improved operations, open data and reusable applications. • Greater revenue returns on e-government investment	• Over US$200 million saved through efficient integrated operations and reduction in wage bills by streamlining duplicated tasks in USA (Harrison et al., 2012; Al Khattab, 2015).

	• High service availability, reliability and data quality.	
G2E	• Improved internal efficiency in communication (e.g. online leave application and salary advice) • Greater and efficient access to internal information, policies and training opportunities. • Improved job satisfaction due to the modernisation of internal operations	• In a study conducted in 13 different government organisations, more than 50% of employees expressed job satisfaction resulting from e-government use (Kanungo & Jain, 2011; Abdalla, 2012).

However, Abdalla (2012) suggests that governments should not overestimate the benefits of adopting e-government for enhancing service delivery. Empirical literature exhibits subdued attitudes and resentment by citizens towards e-government adoption and utilisation (Yonazi, Sol & Boonstra, 2010; Voutinioti, 2013; Kaur & Singh, 2015). Realistically, e-government will not rescue failed governance, stagnating developments and bureaucratic systems that often characterise most developing nations (Rabaa'i, 2015). Similarly, neither does it bring the much-anticipated equality, transparency and social inclusion. As a matter of fact, the introduction of e-government introduces a host of challenges to do with adoption, acceptance, and utilisation for both governments and users (Khanh et al., 2014; Al Khattab, 2015).

2.4.2 Barriers

The adoption of e-government by developing nations is not easy; the fact that e-government is not simply a technological solution, but also combined political-social-economic endeavours affecting both individuals and organisations alike, presents even far more challenges and barriers to adoption (Elnaim, 2014; Schwester, 2009; Nkohkwo & Islam, 2013). There is no general consensus in the literature regarding universal challenges faced by developing nations in e-government adoption. Matavire et al. (2010: 155) posit that when adopting ICT solutions, developing nations should adequately assess the cultural, social and historical context of the target implementation. Furthermore, the UN E-Government Survey (2014) cautioned against

the idea of generalising challenges faced by governments in the entire nation, region or continent. In fact, barriers to e-government adoption are contextual; typically, within the same country, province/state or city there could be digital-divide and e-government-usage-divide across different type of users.

Researchers have come up with the different categorisation of barriers to e-government adoption. For instance, Alshehri (2013: 22) classified e-government barriers into four broader classes, namely, technological, organisational, social and economic. Yet in another study, Ndou (2004) identified eight major challenges pertinent to e-government adoption in developing countries: ICT infrastructure, policy-issues, human-capital development and lifelong learning, change management, partnership and collaboration strategy, and the role of leadership. Alshehri and Drew (2010) came up with an eleven-point broad category of challenges:

1. ICT-Infrastructure
2. Lack of awareness of the existence of e-government
3. Security and privacy of information concerns
4. Lack of qualified personnel and hands-on training on e-government
5. Failure to consider cultural differences and language issues
6. Leaders and management support
7. No policy and regulations on e-government usage
8. Lack of partnership and collaboration
9. The non-existence of strategic planning for e-government adoption
10. Resistance to e-government adoption
11. Financial barriers

Combined, all the efforts by various researchers on classifying challenges to e-government adoption can be summarised diagrammatically as shown in Figure 2-1. Therefore, to overcome these challenges, governments of developing nations should bring all e-government stakeholders to the decision-making table for input and participation to ensure service ownership and build customer trust.

Solid lines in Figure 2-1 indicate the direct influence of the six barriers to e-government adoption and utilisation by citizens. The dotted double arrowed links show the bidirectional interdependence and influence of the linked barriers on e-government adoption and utilisation. For effective adoption and utilisation, governments should identify all barriers and understand

the influence of one barrier on another in influencing adoption and utilisation of e-government by citizens.

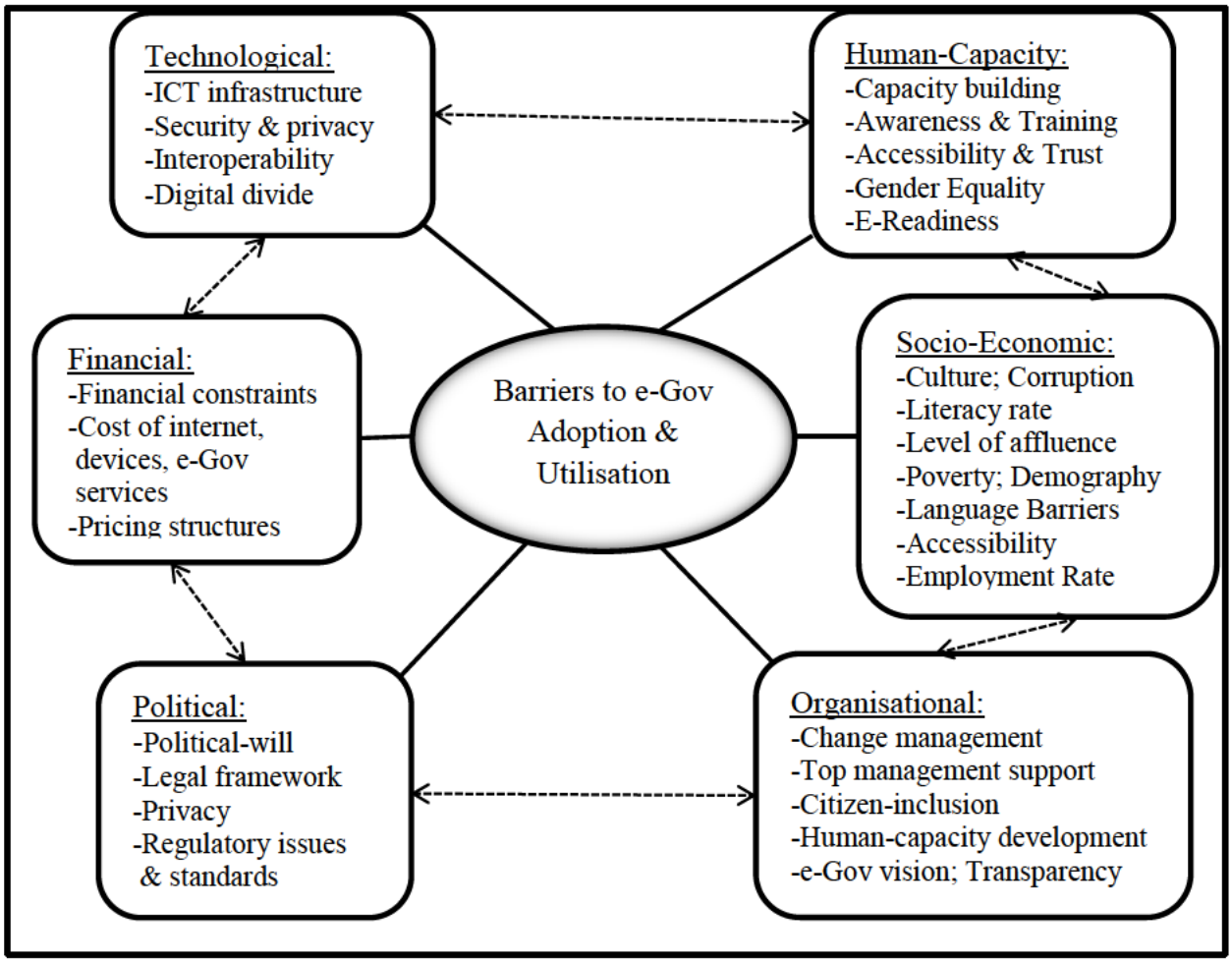


Figure 2- 1: Barriers to e-Government Adoption in Developing Countries

2.5 E-Government Trends around the World

The benefits of digitising government services for the benefits of multi-stakeholder engagement are well documented (Deloitte, 2015; United Nations, 2014). The majority of public organisations world-over are leveraging the power of ICT to improve their efficiency and effectiveness (Chatfield, 2014). The UN e-Government Survey (2014), states that all 193 UN member states have an online website for service delivery to their various constituencies. It is also noted in this report that there are great disparities in stages of online service

development achieved by different member states. Out of 193 member states, only 46 have dedicated e-government web portals.

The E-Government Development Index (EGDI) is used to measure the e-Gov progress of one-member state relative to other member states, as opposed to measuring absolute values of independent member progress – refer to Figure 2-2. Statistically, EGDI is a composite tool, based on weighted average scores of three crucial e-government dimensions of online service index (OSI), the status of telecommunication infrastructure development (TII), and human capital index (HCI) (UN e-Government Survey, 2014). Each one of these three dimensions constitutes a composite measure which is calculated independently and contributes one-third towards EGDI. The OSI is based upon the UN's four-stage e-government maturity model (UN Public Administration Programme, 2010) discussed above. On the other hand, TII is average arithmetic measures based on the ITU's (2014c) Core Indicators for assessing ICT Infrastructure and Access per 100 inhabitants. The last one-third of EGDI is HCI – a concept which recognises that the level of education, experience in ICT and technical abilities play a vital role in a country's economic growth.

In the context of e-government policy formulation and implementation, knowledgeable personnel are key ingredients for success. The same goes for the general public – having "educated citizens who have the right skill sets, knowledge, aptitudes and motivation" makes an impact on e-government adoption and utilisation (UNPAN, 2016: 17). The majority of world rankings of countries on e-government development are based on the EGDI.

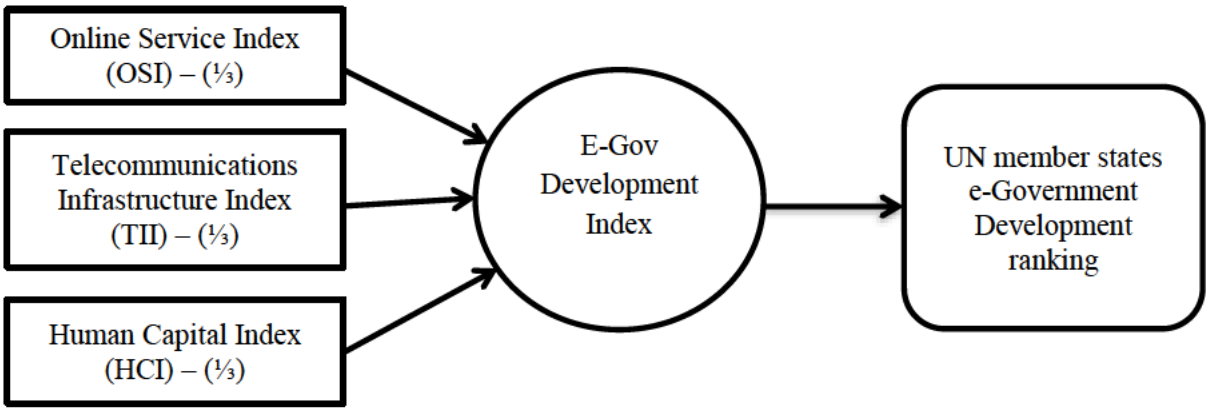


Figure 2- 2: E-Government Development Index (EGDI), (Source: United Nation, 2012)

The national income level for a country is a crucial indicator of its economic performance and capacity and impacts upon domestic e-government growth (United Nations, 2014). Economic growth, living standards, and distribution of income are the three major components used to measure the rate and level of national income. The absence of these three mechanisms affects both the government and citizens' capacity to adopt e-government, even if comprehensive national ICT and e-government policies are in place (United Nations, 2014). Figure 2-3 illustrates the regional averages of e-government development comparative to the world median of 0.4712 EGDI. Furthermore, Africa and Oceania are the two regions lagging behind the rest of the world and are below the world median of 0.2661 and 0.4086 EGDI scores respectively. Europe (0.6936) is leading the regions, followed by the Americas (0.5074) and then Asia (0.4951). However, the world average EGDI does not give a clear picture of individual member states, for instance, Africa has an average score of 0.2661, yet there are six countries with EGDIs above world averages: Egypt, Tunisia, Mauritius, Morocco, Seychelles and South Africa.

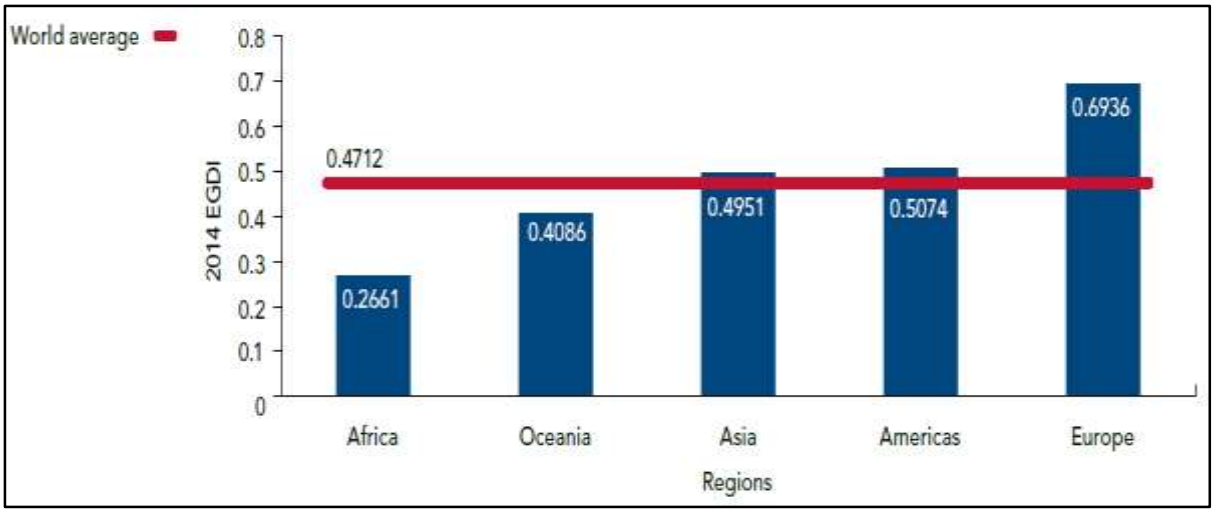


Figure 2- 3: E-Government Development World Regional Averages, (Source: UN, 2014)

2.5.1 Developed versus Developing Countries

There are significant disparities in e-government developments between developing and developed nations, with a stunted growth cited in most developing nations (ITU, 2014a). As indicated above, these inequalities are mainly caused by discrepancies in the three components

of EGDI across countries: online service index, the status of telecommunication infrastructure development, and human capital index.

The ITU (2014a) reported that between 2012 and 2013 alone, developed countries attained an average growth score of 7.20 in the ICT Development Index (IDI), whereas, for the same period, developing countries recorded an average value of 3.84; which is well below the world average score of 4.77. Regarding online service delivery, the Arab States were an exception, the only developing region in the top twenty world rated countries; represented by Bahrain at number seven, followed by United Arab Emirates (12th) and Saudi Arabia (18th) (United Nations, 2014). The higher growth rate in the EGDI for the Arab States is mainly attributed to strong GDP fuelled by oil and natural gas in the region, political will, open market and free trade zones that attract massive investments in ICT infrastructure and the education sector (ITU, 2014a; Al-Khouri, 2013; UNDP, 2013; OECD, 2007).

Several studies have advocated for classifying e-government development according to geographical zones (Figure 2-3) as opposed to individual member states; citing numerous complications associated with heterogeneity in economic-growths, culture, ICT infrastructure, regime-style; e-Gov and internet usage (Abdalla, 2012; Khalil, 2011; Schuppan, 2009). Furthermore, these factors tend to vary immensely between organisations, societies and states – thus complicating individual member states comparison. Table 2-3 illustrates variations between developed and developing countries along different factors.

Table 2- 3: Comparison of Developed vs. Developing Nations

Differences in:	**Developed Nations**	**Developing Nations**
ICT Infrastructure	• Modern ICT infrastructure • Well established and fast internet for both citizens and employees • Well maintained	• Infrastructure often in a bad state and obsolete • Slow internet connectivity • Unreliable ICT and internet service (poorly maintained)

Citizens (Users)	• Better access to the internet, computers and mobile devices • Higher literacy levels • Digital divide and privacy concerns still prevail • Higher e-Democracy participation in the policy-making process	• Low access to the internet due to higher charges *(continues)* • Citizens are hesitant to trust e-services and government • Lower literacy levels • Majority of citizens excluded in e-Democracy participation in the policy-making process
Cultural and Governance Aspects	• Higher living standards • Well established record of democracy • More transparent government policy • Consistent economic growth, with increased productivity • E-Government often a priority in most countries to achieve good governance and better service delivery.	• Low standards of living • Relatively short history of democracy • Reported corruption in some countries, with less transparent government policy • Most countries are associated with poor, stagnant, declining to slow economic growth. • E-Gov often not a major priority
Government Employees	• Competent technical staff, often younger specialists • Good financial resources to outsource expert services • Well-established in-house and outside training programs	• Incompetent and technophobic elderly-dominated workforce • Characterised by high staff turnover of competent technical staff

	• Willingness to learn innovations and implement them	• Corrupt outsourcing and tendering systems that lead to poor services • High resistance to change, especially digitisation

2.5.2 E-Government Trends in Africa

The African continent is constituted of two distinctive regions, the Northern Region and the sub-Saharan Region. The Northern Region is predominantly Arab speaking, with contrasting cultural practices and well-established economies backed with rich oil and gas deposits (Abdalla, 2012). Conversely, the sub-Saharan Region which constitutes the largerr part of the African continent; with the exception of South Africa, is confronted with great socio-economic and administrative turmoil; over and above low human capital investment, poor infrastructure, and funding mechanisms. The United Nations e-Government Survey (2016) reported that the majority of countries in Africa are facing low levels of e-government adoption and utilisation due to some inadequacies in human capacity, telecommunications, and online service developments.

On the ICT front, Ramos (2014) indicates that the sub-Saharan region is beset by a host of deficiencies as indicated in section 2.4.2, on barriers to ICT adoption. To overcome these challenges governments should strive for good governance, enter into strategic partnerships with both non-governmental organisations and the private sector in matters of national investments to boost ICT and economic growth, create employment and boost literacy rates through outreach and awareness campaigns in remote areas where the majority of citizens live (UN, 2014). Moreover, Knoema (2016) substantiated the United Nations' (2014) notion by established that in the context of Africa, countries like Rwanda, Mauritius, Seychelles and South Africa are achieving higher scores on good governance.

There are five major issues that governments in Africa need to address first in order to overcome e-government adoption and utilisation barriers and achieve transactional e-Government: ICT policy formulation and alignment with ICT adoption, e-readiness, education, and awareness. Studies on ICT and e-government adoption in Africa suggest that there is often

some lag time between policy formulation and practical implementation, such that by the time of adoption, the technology is obsolete (Schuppan, 2009; Bwalya & Mutula, 2014; Munyoka & Manzira, 2014: Dombeu & Rannyai, 2014). Furthermore, regulatory policy frameworks to establish and adhere to security and trust issues in e-government are minimal and as a result, citizens have little trust in government online services (Venkatesh, Thong, Chan & Hu, 2016). Other proponents of e-government adoption and utilisation in developing nations have recommended local-context solutions to address contextual challenges and this approach has yielded positive results in countries like South Africa, Tunisia, Mauritius and Seychelles (United Nations, 2012, 2014; Heeks, 2009; Mutula, 2013). Practical implementation of policies on liberalisation of the ICT and the telecommunication sector in Africa is essential for opening up the ICT-sector and contributes to economic growth.

E-readiness assessment and initiatives ensure that governments are able to implement a SWOT analysis of its EGDI variables to identify key areas to focus on. Any e-service, e-readiness assessment includes an analysis of the status quo of ICT literacy levels of users, their online service needs, digital and service utilisation divide issues, financial constraints on access to e-services; and outreach efforts by government agencies (Keikha & Sadeq, 2015; Al Salmi & Hasnan, 2015). Inadequate e-readiness assessment is one of the major contributing factors for e-government adoption and utilisation failure in Africa and governments should pay special attention to it (Ruhode, 2013; Hafkin, 2009).

Hafkin (2009) suggests that most e-government initiatives in Africa emanate from the supply-driven side by international donor agencies and this leads to a high failure rate. Additionally, Chango (2007) notes that most donor agencies in Africa engage government throughout the implementation phase of e-government adoption but leave the task of citizen orientation and outreach campaign to the government and its agencies. Citizens may be more likely to take ownership of e-government initiatives, leading to high utilisation and service loyalty if they are involved from the onset of decision-making processes and until project completion. Governments should focus on developing human ICT skills and the capacity to use and manage e-government systems. Table 2-4 illustrates Africa's leading ten countries on e-government development index. Out of the ten countries, only six (Tunisia, Mauritius, Egypt, Seychelles, Morocco and South Africa) have achieved EGDI scores exceeding the world average of 0.4712 (United Nations, 2014). The remaining 48 countries in Africa are below the world average –

more effort and commitment from all concerned stakeholders to e-government is required to improve.

Table 2- 4: Africa's leading ten countries on EGDI

Country	EGDI	EGDI Level	2016 World Rank	2014 World Rank	2012 World Rank	Change in Rank (2014-2016)
Mauritius	0.5390	High	58	76	93	↑18
Tunisia	0.5338	High	72	75	103	↑3
South Africa	0.5129	High	76	93	101	↑17
Morocco	0.5113	High	85	82	120	↓3
Seychelles	0.5060	High	86	81	84	↓5
Cape Verde	0.4869	Medium	103	127	118	↑24
Egypt	0.4198	Medium	108	80	107	↓28
Botswana	0.3880	Medium	113	112	121	↓1
Libyan Arab Jamahiriya	0.3805	Medium	118	121	191	↑3
Kenya	0.3753	Medium	119	119	119	-

Key: ↑, indicates again/increase in world EGDI ranking

-, shows constant ranking (maintained the same EGDI ranking)

↓, indicate a drop in world EGDI ranking

(Source: United Nations, 2016)

2.5.3 E-Government Trends in the SADC Region

The SADC regional block is made up of 15 member states, and just like the rest of the African countries, the region is striving to embrace digitisation in the area of e-Health, e-Learning, e-government and m-Services to advance its "competitive edge in the global economic value chains" (Bwalya & Healy, 2010: 23). United Nation (2016) have suggested four major categories for classifying EGDI with average EGDI values ranging between zero and one: very high (ranging from 0.75 to 1.00), high (above 0.50 and below 0.75), middle (above 0.25 and below0.50), and low (less than 0.25). Table 2-5 shows that out of the 15 SADC member states,

only, Mauritius (0.6231), Seychelles (0.5181) and South Africa (0.5581) have achieved EGDI indexes above the world average (0.4922) and developing average (0.3591) scores.
E-Participation Index (EPI) is concerned with the provision of online services by government and the subsequent utilisation of such e-services by citizens to access government information and services. Moreover, Table 2-5 shows that between 2014 and 2016, only three nations (Mauritius, Tanzania and South Africa) have achieved EPI above both the developing countries (0.3718) and world average (0.4625) indexes. Zambia realised a sharp EPI rise (from 0.1765 in 2014 to 0.3559 in 2016) – thanks to government campaign efforts in creating e-government awareness among citizens on radio and over the television (Bwalya, 2017). For the same period, six countries (Botswana, Lesotho, Madagascar, Mozambique, Namibia and Zimbabwe) have realised some decline in their national EPI, indicating low participation and uptake of e-government services by citizens. The United Nations (2016) suggests that such declines in EPI could be attributed to numerous factors like dwindling disposable incomes due to economic hardships, escalating the cost of internet data bundles, unavailability of online services preferred by citizens and due to lack of political will by governments.

At the regional level, the SADC advanced an ICT-Development policy named 'e-SADC Strategic Framework', which lays out the roadmap for broader ICT infrastructure harmonisation, utilisation for socio-economic growth and regional integration (SADC, 2012, 2015). ICT has been identified by the regional block as one of the major enablers and catalysts to industrialisation and as such, was earmarked for mainstreaming into the socio-economic revitalisation process. Of significance is the fact that member states can further fine-tune the e-SADC Strategic Framework to suit their current local context. Moreover, the framework addresses the issue of social inclusion of the poor and marginalised communities by member states since it has been observed in many studies that one of the major pitfalls of e-government in most developing countries is low adoption and utilisation levels (Yonazi, Sol & Albert, 2010; Rokhman, 2011; ITU, 2008; Khanh et al., 2014). The e-SADC Strategic Framework aims to address five major areas of ICT development (SADC, 2012):

1. Harmonised ICT Regulatory Framework that supports diffusion and utilisation
2. Universal ICT Infrastructural Development and open access;
3. Citizen Participation in ICT-related Developments and governance;
4. Harnessing ICT for Business Development; and
5. Human-Capacity building in ICTs for an e-literacy and a self-sustaining society.

Table 2- 5: Analysis of e-Gov Progress across SADC Countries for 2012 to 2016

Country	OSI			TII			HCI			EGDI			EPI		World Rankings in EGDI		
	2012	2014	2016	2012	2014	2016	2012	2014	2016	2012	2014	2016	2014	2016	2012	2014	2016
Angola	0.3333	0.2992	0.3478	0.0892	0.0978	0.1441	0.5383	0.4941	0.5015	0.3203	0.2970	0.3311	0.2353	0.4407↑	142	140↑	142↓
Botswana	0.3595	0.3071	0.2826	0.1873	0.2969	0.4215	0.7091	0.6555	0.6553	0.4186	0.4198	0.4531	0.3137	0.2881↓	121	112↑	113↓
DRC	0.0784	0.0472	0.0870	0.1275	0.0337	0.0788	0.6369	0.3845	0.3970	0.2809	0.1551	0.1876	0.0196	0.0847↑	157	183↓	180↓
Lesotho	0.3007	0.1575	0.1377	0.0499	0.1179	0.1787	0.6997	0.5135	0.5147	0.3501	0.2629	0.2770	0.1373	0.1186↓	136	153↓	154↓
Madagascar	0.3203	0.2441	0.2246	0.0520	0.0488	0.0514	0.5438	0.4889	0.4488	0.3054	0.2606	0.2416	0.3529	0.2034↓	148	155↓	163↓
Malawi	0.2157	0.1732	0.2174	0.0321	0.0484	0.0485	0.5741	0.4746	0.4535	0.2740	0.2321	0.2398	0.2353	0.2881↑	159	166↓	166–
Mauritius	0.4314	0.4724	0.7029	0.3296	0.4406	0.4596	0.7588	0.6882	0.7067	0.5066	0.5338	0.6231	0.5294	0.6610↑	93	76 ↑	58 ↑
Mozambique	0.3660	0.3150	0.2029	0.0443	0.0545	0.0993	0.4255	0.3457	0.3893	0.2786	0.2384	0.2305	0.3333	0.2034↓	158	164↓	172↓
Namibia	0.3007	0.3228	0.2826	0.1385	0.2719	0.2669	0.7419	0.5693	0.5551	0.3937	0.3880	0.3682	0.3333	0.2373↓	123	117↑	125↓
Seychelles	0.3333	0.3307	0.4058	0.4037	0.4721	0.4624	0.8204	0.7310	0.6861	0.5192	0.5113	0.5181	0.2549	0.4068↑	84	81 ↑	86 ↓
South Africa	0.4575	0.3858	0.5580	0.2214	0.3466	0.3807	0.7817	0.7282	0.7253	0.4869	0.4869	0.5546	0.3333	0.5593↑	101	93 ↑	76 ↑
Swaziland	0.1438	0.1339	0.2754	0.1125	0.1629	0.1601	0.6973	0.6200	0.5882	0.3179	0.3056	0.3412	0.1569	0.2542↑	144	138↑	136↑
Tanzania	0.3529	0.2992	0.5725	0.0839	0.0808	0.0900	0.5564	0.4492	0.3974	0.3311	0.2764	0.3533	0.3922	0.5932↑	139	146↓	130↑
Zambia	0.3137	0.1417	0.3696	0.0601	0.1247	0.1182	0.4993	0.4504	0.5643	0.2910	0.2389	0.3507	0.1765	0.3559↑	154	163↓	132↑
Zimbabwe	0.3007	0.3071	0.2609	0.1099	0.2238	0.2167	0.6644	0.5445	0.5641	0.3583	0.3585	0.3472	0.4510	0.2881↓	133	126↑	134↓

(Continues)

Regional Averages	**OSI**			**TII**			**HCI**			**EGDI**			**EPI**		
Africa	0.2567	0.2011	0.2567	0.1094	0.1478	0.1724	0.5034	0.4492	0.4355	0.2780	0.2661	0.2882	0.2190	0.2599	
Developing Countries	0.4311	0.2710	0.3474	0.2860	0.2025	0.2131	0.7553	0.5368	0.5170	0.4865	0.3368	0.3591	0.2935	0.3718	
World	0.4328	0.3919	0.4623	0.3245	0.3650	0.3711	0.7173	0.6566	0.6433	0.4882	0.4712	0.4922	0.3947	0.4625	

Key: *(a).* ↑ - shows gains in rankings and improvement in the progress made in e-government

(b). ↓ - shows a decline in rankings and progress made in e-government

(c). – - shows stagnation in rankings and constant progress in e-government

(Source: United Nations, 2016b; 2014; 2012)

Internet access and usage are major catalysts for e-government adoption and utilisation and governments' world over should make internet services easily available and allowable to all citizens. Internet use for the entire African continent is gradually growing, with noticeable growth being achieved in Egypt, South Africa, Tunisia, Mauritius and Botswana (Nyirenda-Jere & Biru, 2015). According to the ITU (2013a), Africa's average internet use per 100 inhabitants stood at 16.3, the lowest compared to all other continents.

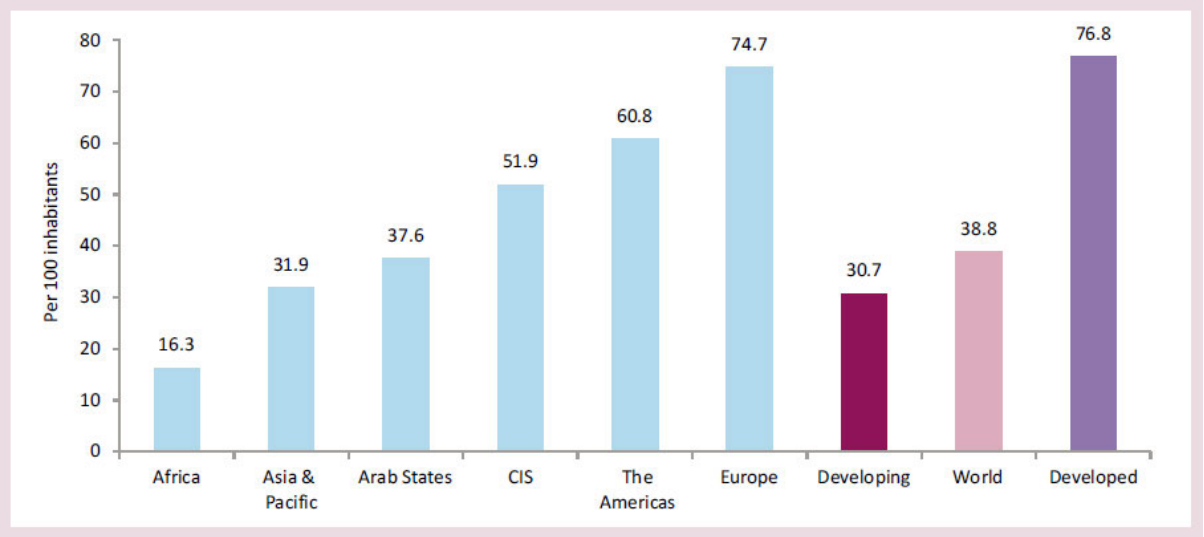


Figure 2- 4: Internet users by Region and Level of Development, (source: ITU, 2013a)

As indicated in Figure 2-4, the average internet usage per 100 inhabitants for developing nations is 30.7 and this falls short of the world average usage rate of 38.8. In addition, the average internet penetration rate for the SADC region stood at 25.3%, which is 3.3% below the average for Africa (28.6%) and far below the world average (46.4%) (Internet World Stats, 2016). Many studies (ITU, 2013a; Nyirenda-Jere & Biru, 2015; West, 2015; Acilar, 2011) have attributed the lower internet usage in most developing countries to poor internet connectivity, high internet tariffs, and lower literacy levels and due to lack of government supporting programmes to create awareness and promote utilisation. Therefore, it is the goal of this study to establish what is being done by SADC member states to make internet services available and allowable to citizens; leading to e-government adoption and utilisation.

2.6 In-depth Analysis of e-Gov initiatives in Zambia

As reiterated throughout this study and evidenced world-over, ICTs underpins and facilitate high levels of business and service efficiency for both the private and public sector (World Economic Forum, 2014; World Bank, 2012). This is one of the major drivers for harnessing ICTs into the public-service delivery system.

On the practical implementation frontier, large numbers of e-government projects in Zambia were spearheaded by a non-governmental organisation, donor agencies, and the private sector, at community-level in collaboration with the government to address local problems as opposed to technological issues (Macha Works, 2016). The Zambian Research and Development Centre (ZRDC) is a government agency mandated by the government to spearhead e-government projects for various government departments. This demonstrates that Zambia has great potential to reap the gains of e-government adoption once the government nominates committed project champions within the influential government levels to head community-based small projects. Currently, this is a missing link since the tasked Ministry of Communications and Transport lacks capacity.

Annual United Nations E-Government Surveys are the prime source of the current information on the progress made by the 183 UN member states. The latest e-Government Survey (2016) gives the most recent progress on e-government initiatives and adoption in Zambia. These are discussed below.

2.6.1 ITU e-Gov Implementation Toolkit for e-Readiness Assessment

The ITU e-Government Implementation Toolkit (ITU, 2009) is a comprehensive framework for assessing a country's readiness to adopt e-government. The framework allows policy and decision makers to conduct a SWOT analysis before and after e-government adoption in lower to high-income countries along four fundamental dimensions: ICT infrastructure, policy, outreach, and governance. SADC countries lie in the lower to middle-income GDP per capita, with values below $1,045 (low-income nations like Zimbabwe) and those that range between $1,045 and $12,736 (middle-income economies like South Africa and Zambia) (World Bank, 2016a).

The level of GDP per capita has an effect on the rate of technological adoption. The World Development Indicator Report (World Bank, 2014) suggests that the majority of countries with higher GDP per capita enjoy rapid ICT adoption and utilisation levels; whilst those with the lower GDP per capita struggle to keep pace. Indeed, e-government took off slowly at the institutional level and gradually diffused to the public domain due to government intervention (Habeenzu, 2010; Mzyece, 2012). Discussed below is Zambia's e-government readiness assessment in relation to the four major dimensions of the implementation toolkit.

2.6.2 ICT Infrastructure

ICT infrastructure provides the government with one of the major conduits and mechanisms to transact and communicate with citizens, business, and government employees and agencies. Therefore, a broader understanding of the status (both quantity and quality) of ICTs in Zambia is indispensable since e-government adoption relies on the availability of sound ICT infrastructure. Furthermore, the level of ICT diffusion within public administration, ICT and data access and usage by the general citizenry and business are further indicators that should be established to have a clear picture of the Zambian government's efforts to boost the proliferation of e-government in the country. To better understand and assess the status of ICT infrastructure in Zambia, this study uses the ICT Development Index (IDI) four-stage model (ITU, 2015):

1. *First Stage*: **ICT-Readiness** – investigates advances made in networked infrastructure and the citizenry's 'access' to ICTs and e-government. Major infrastructure and access indicators to be scrutinised are: "fixed telephone subscriptions, mobile-cellular telephone subscriptions, international Internet bandwidth per Internet user, households with a computer, and households with Internet access" (ITU, 2015:40).
2. *Second Stage*: **ICT-Intensity** – scrutinises the 'utilisation' of ICTs and e-government by the citizenry. The model acknowledges that an individual's capability to use e-government is directly determined by his or her skills and level of experience. Three major intensity pointers examined are persons using the internet, fixed broadband connectivity, and mobile broadband registered users.
3. *Third Stage*: **ICT-Impact** – examining the result of utilisation of ICT and e-government.

ICT-Capability makes up the fourth sub-index (stage) and reveals the prevailing skills level of literacy essential for accepting and utilising ICTs. Adult literacy rate, gross-secondary-enrolment, and gross-tertiary-enrolment are the three extensively used indicators. The impact of e-government is significantly affected by the prevailing levels of ICT skills and essentially, a requisite to leveraging the full potential for social inclusion and economic growth. Figure 2-5 illustrates an information-based society founded on the interplay of the four major IDI sub-indexes.

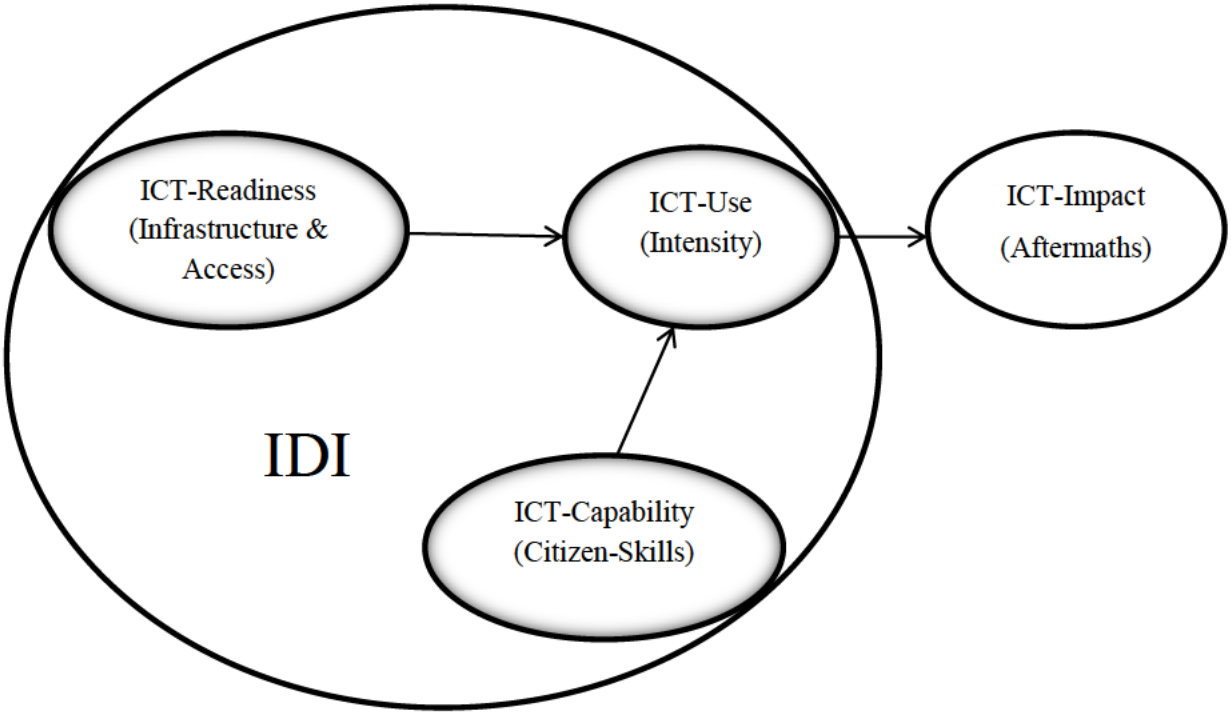


Figure 2- 5: ICT Development Index Model, (source: adapted from ITU, 2015)

Table 2-5 illustrates that Zambia's ICT Development index has slightly increased from 1.550 in 2010 to 2.040 in 2015. However, a score of 2.040 for Zambia falls far below both the global average score of 5.03 and average-value for emerging economies of 4.12. Essentially, such a low score illustrates the existence of the digital, access and e-service utilisation divides. Just like in most developing countries, disparities exist in access to and utilisation of e-services by citizens in Zambia and this is compounded by the fact that the level of affluence (as measured by basic infrastructure and income) drastically diminishes as one moves from urban to rural-remote areas (ITU, 2009:13).

Furthermore, such comprehensive information of IDI provides essential and objective information to decision makers in government for evaluating Zambia's performance in ICT initiatives and pointing to areas requiring extra attention (Knoema, 2016). Specifically, since access to and use of the Internet by individuals has a strong bearing on e-government utilisation, the Zambian government has to pay great attention to increase the percentage of households with internet access (12.7%) (ZICTA, 2015:13) compared to 34.1% for developing countries and 46% for the world average (ITU, 2016). Tariffs for internet access are high in Zambia, just like in most SADC member states. Since the availability of and access to the internet is a requirement for e-government adoption and utilisation, governments in the SADC regional block should find ways to make internet access allowable for the ordinary citizens.

Likewise, Zambia's mobile cellular penetration as measured by active mobile subscribers per 100 inhabitants is very low – 1/100. It should be recalled that e-government is metamorphosing into m-Government world-over; thanks to the proliferation of mobile connected devices. Zambia should devise mechanisms to hasten the expansion of mobile cellular networks, possibly through liberalisation of the sector to allow direct investment. The OECD (2011a) notes that the unprecedented growth in mobile cell phone ownership in developing countries has presented new opportunities for government to revamp service delivery through m-Government. But with mere 17.3 out of 100 people using the internet, Zambia lags behind many countries in mobile cellular penetration. Bwalya (2015) speculates that internet access in Zambia remains a privilege of minority elite groups. With such low scores, Zambia is missing out to seamlessly integrate its service delivery and remain competitive in the global economy. Table 2-6 also indicates that internationally, with an average score of 3.71 on skills sub-index, Zambia is trailing behind Africa (4.20), developing nations (6.06) and the World (6.81) averages (ITU, 2015).

Effective ICT and e-government operations require a reliable power supply. The entire SADC region has been rocked by persistent power irregularities which threaten consistent e-government service provision. Long hours of power-cuts averaging 6-10 hours per day have been reported in the economic hub province of Lusaka (Engineering Institution of Zambia, 2015); and the government has to do something to rescue this situation.

Table 2- 6: Zambian's ICT Development Indicators (2010 - 2015)

ICT Development Indicator for Zambia	Units	2010	2014	2015
ICT Development Index (IDI)		1.550		2.040
ICT Development Index Rank		152.000		153.000
Access sub-index		1.710		2.630
Access Rank		155.000		150.000
Fixed-telephone subscriptions (per 100 inhabitants)	per 100 inhabitants	0.900	0.800	
Mobile-cellular subscriptions (per 100 inhabitants)	per 100 inhabitants	41.200	67.300	
International Internet bandwidth (Bit/s per Internet user)	Bit/s per Internet user	378.000	4,223.000	
Percentage of households with computer	%	3.700	6.600	
Percentage of households with Internet	%	3.100	6.900	
Use sub-index		0.350		0.620
Use Rank		129.000		146.000
Percentage of individuals using the Internet	%	10.000	17.300	
Fixed-broadband subscriptions (per 100 inhabitants)	per 100 inhabitants	0.100	0.100	
Active mobile broadband subscriptions (per 100 inhabitants)	per 100 inhabitants	0.300	1.000	
Skills sub-index		3.650		3.710
Skills Rank		145.000		148.000
Gross enrolment ratio, Secondary	%	45.500	45.500	
Gross enrolment ratio, Tertiary	%	2.400	2.400	
Adult literacy rate	%	61.400	63.400	

(Source: Knoema, 2016)

Despite facing challenges in the ICT infrastructure frontier, there are noteworthy community-based e-government projects in Zambia; mainly spearheaded by NGOs and international organisations. Notably, the Linknet ground-breaking project championed by Macha Works international organisation in rural Macha community to deliver internet access to locals and assist the community to acquire ICT skills relevant to their local problems and using local language (van Stam & van Greunen, 2014; Macha Works, 2016; PANOS, 2011). The organisation utilises shipping containers to provide internet access using satellite dishes and develops local ICT skills through training to ensure sustainability and knowledge exchange. The Zambia National Farmers Union (ZNFU) initiated an m-government service utilising short message service (SMS) to convey farm produce commodity prices, trade information and veterinary services to micro, small and medium-sized farmers across the country. Savings in transport costs and agriculture service broker charges are achieved through elimination of third parties in the agriculture value chain.

The Mwana m-health program launched in 2010 by the Zambian Ministry of Health in conjunction with UNICEF offers 'early infant HIV test results via SMS' to parents across 40 piloted clinics (United Nations, 2014). This initiative has successfully reduced the turnaround time of receiving HIV results by half.

Other notable e-government projects were initiated by the Zambian Research and Development Centre: e-Public Service Management System, Government Knowledge Management System, e-Council Management System, e-School Information Management System, e-Registrar of Societies Management System, e-Police Criminal Record Tracking System and e-Police Public Complaints Authority Information Management System (ZRDC, 2011). Most of these e-government services are in the enhanced and transactional phases of the UN e-government maturity model. The presence of a digital and e-service utilisation divide across Zambia is widespread, and it gets progressively worse as one moves away from metropolitan areas towards remote rural communities (Bwalya, 2012).

2.6.3 Policy

The roadmap to e-government initiatives in Zambia dates back to 2001 when the national ICT policy drafting commenced in consultation with all major stakeholders focusing on thirteen core areas (ZICTA, 2015; Zambia Ministry of Communications and Transport (ZMCT), 2006):

1. Access, Media, Content, and Culture
2. Agriculture
3. Education
4. E-Government
5. The growth of ICT Services
6. Health
7. Human Capacity Development
8. ICT Infrastructure
9. Legal and Regulatory Framework
10. Security of the Information Society
11. Enhanced Tourism, Environment & Natural Resources
12. E-Commerce
13. Youth and Women

The final ICT policy document was concluded in 2005 and then adopted in 2006 (ZNICP). In essence, five years had elapsed since its inception, and by then technology had changed substantially - thus rendering most of the highly acclaimed ICT policies irrelevant. Having been advised by experts on the importance of strategic alignment of ICT policies with practical

implementation; the Zambian government, through its Zambia Information and Communications Technology Authority (ZICTA), passed various acts and statutory instruments. The Information and Communication Technologies Act of 2009; The Electronic Communications and Transactions (ECT) Act of 2009 and Statutory Instrument no. 35, 2010 ICT Licensing Regulations of 2010 to amend the national ICT policy; to date there has been not been significant ICT adoption.

The ITU e-Government Implementation Toolkit (ITU, 2009) presents priority areas for regulating the e-government environment: rules to govern competition, trust, and standardisation; ICT policies and regulations; and government strategies for promoting ICT and e-government service adoption. Since the enactment of the ECT Act in 2009, the Zambian ICT sector has witnessed a boom in investment in the mobile voice market, broadband infrastructure, international gateway liberalisation by Zambia Telecommunications Company (ZAMTEL) in 2010 by inviting foreign direct investment into the state-owned Telecoms Company; and increased access to and utilisation of ICTs by citizens (Habeenzu, 2010: 34).

The policy is succinct on e-government as a re-engineering process for the rejuvenation of Zambia's service delivery, and there has been generic commitment and political will for transformation into a knowledge economy. However, in reality, little progress has been made. Similarly, the national ICT policy remarks that "all [government] sectors shall draw their ICT policies and implementation plans from this policy […] and will be consolidated into 'The National ICT Implementation Plan', with sub-plans for implementation on a priority basis covering the short, medium and long-term" (Zambia Ministry of Communications and Transport, 2006:64). Mzyece (2012) point out that by now the nationwide-ICT-implementation-plan to cater to this quoted clause has not been crafted – thus nullifying the relevance of such an ICT policy. ZICTA (2015) cited regulatory issues requiring government intervention to encourage direct investment in the ICT sector: reducing licensing fees to strengthen local-investment, lowering tariffs for broadband and internet by the Zambian ICT Authority (ZICTA) to stimulate both access and utilisation and expand ICT skills capacity-building across all government levels to ensure competent implementation of secure e-government systems.

2.6.4 Governance

The World Bank (2015a) defines governance as consisting "of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them." World Governance Indicators (WGI) is an instrument used to assess the soundness of an individual country's performance in governance using both quantitative and qualitative means. The WGI identifies six major sub-indexes to measure governance: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule-of-law, and control-of-corruption.

Studies on governance (International Monetary Fund, 2015; Klitgaard, 2014; Zondi, 2009) suggest that high socio-political instability characterising sub-Saharan Africa and numerous developing nations world-over are barometers of poor governance. Moreover, Mzyece (2012), cited corruption and nepotism in the awarding of e-government and ICT project tenders as a major problem hindering the provision of high-quality solutions that could be trusted by the broader citizenry. Despite having entered into regional and global treaties (UN Convention against Corruption (UNCAC); African Charter on Democracy) on MDGs concerning "improved governance, as well as human rights, peacebuilding, the rule of law and transparency", bad governance is prevalent in sub-Saharan Africa (UNDP, 2014: 2). Good governance is pivotal for sound decision making on serious matters of e-government adoption; particularly citizen participation in decision making prior to implementation and absence of censorship on online public services by the government (which lead to antitrust-sentiments).

Table 2- 7: Worldwide Governance Indicators (2010 – 2015)

Country	Governance Indicators:	Units	2010	2011	2012	2013	2014
	Voice and Accountability, Estimate	*See Key*	-1.4780	-1.4718	-1.4451	-1.3832	-1.2774
	Political Stability and Absence of Violence/Terrorism, Estimate	*Bellow*	-1.1209	-0.9552	-0.7903	-0.6796	-0.6484
	Government Effectiveness, Estimate		-1.4952	-1.3576	-1.1983	-1.1844	-1.1759
	Regulatory Quality, Estimate		-2.0532	-1.9234	-1.8283	-1.7818	-1.8886
	Rule of Law, Estimate		-1.8132	-1.7778	-1.6118	-1.5602	-1.4219
Zimbabwe	Control of Corruption, Estimate		-1.3061	-1.3783	-1.2698	-1.3576	-1.3887
	Voice and Accountability, Estimate		-0.2557	-0.1774	-0.1434	-0.1084	-0.1449
	Political Stability and Absence of Violence/Terrorism, Estimate		0.4616	0.4707	0.6060	0.3843	0.2056
	Government Effectiveness, Estimate		-0.8300	-0.6358	-0.4997	-0.5167	-0.4685
	Regulatory Quality, Estimate		-0.4786	-0.4212	-0.4288	-0.4829	-0.5157
	Rule of Law, Estimate		-0.4978	-0.4679	-0.4027	-0.3071	-0.2527
Zambia	Control of Corruption, Estimate		-0.5654	-0.4697	-0.3576	-0.3818	-0.4146
	Voice and Accountability, Estimate		0.4421	0.3962	0.5030	0.4712	0.4408
	Political Stability and Absence of Violence/Terrorism, Estimate		0.9607	1.0505	1.0801	1.0812	1.0219
	Government Effectiveness, Estimate		0.4636	0.4796	0.4474	0.3683	0.3213
	Regulatory Quality, Estimate		0.4561	0.5003	0.6939	0.6541	0.6411
	Rule of Law, Estimate		0.6662	0.6576	0.6537	0.5855	0.6346
Botswana	Control of Corruption, Estimate		1.0033	0.9799	0.9186	0.9119	0.7993
	Voice and Accountability, Estimate		0.5833	0.5738	0.5558	0.5799	0.6528
	Political Stability and Absence of Violence/Terrorism, Estimate		-0.0190	0.0317	-0.0209	-0.0448	-0.0756
	Government Effectiveness, Estimate		0.3927	0.4127	0.3252	0.3822	0.3284
	Regulatory Quality, Estimate		0.3555	0.4019	0.3741	0.4096	0.3220
	Rule of Law, Estimate		0.1075	0.1207	0.0753	0.1202	0.1594
South Africa	Control of Corruption, Estimate		0.0928	0.0273	-0.1653	-0.1260	-0.1133
	Voice and Accountability, Estimate		0.1499	0.0635	0.0846	0.0057	-0.0069
	Political Stability and Absence of Violence/Terrorism, Estimate		0.8847	0.9647	0.7569	0.8374	0.4153
	Government Effectiveness, Estimate		0.1815	0.2558	0.3757	0.3355	0.3912
	Regulatory Quality, Estimate		-0.5699	-0.4355	-0.3099	-0.3115	-0.3138
	Rule of Law, Estimate		0.0235	-0.0256	-0.0373	0.0427	0.0995
Seychelles	Control of Corruption, Estimate		0.2928	0.2549	0.3336	0.3856	0.3718

(Source: Knoema, 2016); **Key**: UNITS-Range, -2.5 (weak) to +2.5 (strong).

Table 2-7 shows that Zambia performs better than South Africa in political stability and absence of violence (0.2056) and dismally in the other five governance indicators. This marginal achievement in governance may not warranty investors' confidence in e-government and the ICT sector. Likewise, with such low governance scores, the Zambian government has a mammoth outreach assignment to convince citizens to trust the public service delivery system and e-government. However, as such governance conditions prevail across the majority of developing countries (United Nations, 2014a; UNDP, 2014; Zondi, 2009); it appears a noble idea for the Zambian government to institute and enforce stringent governance measures that encourage the growth and utilisation of e-governance. Table 2-7 shows that out of the five sampled countries, Zambia is trailing behind three countries (Botswana, South Africa, and Seychelles) in good governance (rule of law, control of corruption; censorship and accountability). Moreover, Table 2-7 shows that both Zimbabwe and Zambia did not perform well on good governance measure.

The NORAD report (2011) on anti-corruption efforts in Zambia reported a 29% level of corruption in the police force which is prevalent in metropolitan areas. To eradicate corruption, the Zambian government has established several anti-corruption bodies to enforce good governance: the anti-corruption commission (2008), task force on corruption (2007) and public sector management reforms (2009) (NORAD, 2011).

2.6.5 Outreach

In the realm of e-government, outreach speaks of the status and efforts dedicated to educating the general citizenry about e-service delivery. A candid account of outreach (Majdalawi et al., 2015: 219) maintains that e-government "services are only useful if people know about" their existence and are educated and motivated to use them. Successful e-government adoption requires governments to assess two fundamental aspects of outreach: the supply activities and potential demand; and service uptake and utilisation by stakeholders (ITU, 2009).

The supply-side of e-government is measured by scrutinising the complexity and functionality of government portals. Citizen satisfaction with e-government services is one of the most well-known pointers of how well a government is satisfying the service needs of its stakeholders. Alawneh et al., (2013) suggest that the failure by most regimes in developing countries to ascertain citizen satisfaction with e-government services resembles the darkest side of e-government adoption and often a causal point of failure for most projects. In the Zambian context, statistics on citizens' contentment with e-government services are unavailable in the public domain. Most studies done hitherto on e-government tend to concentrate more on adoption (Bwalya et al. 2012; Bwalya & Healy, 2010; Mzyece, 2012) and challenges (Bwalya, 2011) at the expense of access, utilisation and satisfaction (Danila & Abdullah, 2014; Yaghoubi, Haghi & Asl, 2011; Chatfield, & AlAnazi, 2013; Chan et al., 2010). The greater impact of small-community-based projects, often spearheaded by NGOs has been reported in rural areas of Zambia (Macha Works, 2016). The major reason for project success is attributed to targeting community-based problems using language-tailored training to address ICT skills and service needs. However, absolute assessment of user satisfaction either qualitatively or quantitatively is still missing in the literature – thus calling for further studies.

Other widely used indicators for the supply-outreach are the two indices of UNDESA's 'UN E-Government Survey': Web Measure index and e-Participation index (ITU, 2009: 18). Web Measure index assesses web-portal features of key government ministries and departments, in-line with their usability, completeness and how helpful they are in meeting the diverse needs of stakeholders (mainly citizens and business). UNDESA in all its UN E-Government Surveys (2008–2014), has been targeting ministerial websites that are demanded most by the general populace: Ministries of Health, Finance, Education, Labour and Social Works (ITU, 2009).

In line with the Web Measure index, the UN E-Government Survey (2014: 146) has identified seven core usage-enhancing website features:

1. The *"Contact us"* information
2. *"Search"* facility
3. *'Help'* section and *'Frequently Asked Questions (FAQs)'* sections
4. Instructional sections for users on how to use essential features and datasets for open source data access and manipulation
5. Sitemap and index
6. Advanced web-search and filter options
7. Video content

In addition to these seven features, the researcher proposes another feature, 'frequency of content update – (current information)'. The Global Information Society Watch (2014) maintains that most web-users shun visiting government websites due to stale information – frequency of content update is a cause for concern. Close analysis of Zambia's five ministerial department websites (Health, Finance, General Education, Labour and Social Security) shows encouraging progress and scores as summarised in Table 2-8. In-depth scrutiny of the four ministerial websites and the Zambian e-government portals shows the Ministry of Health has the most usage-enhancing website feature; only falling short on advanced web-search. The rest of the ministerial departments have almost similar features and more effort is inevitably required to match high standards set by the Ministry of Health.

Table 2- 8: Web Measure index for Zambia's five Ministerial Departments

Ministerial Department	**Web Measure index (usage-enhancing website feature available?)**						
	Contact Us	Search facility	Help & FAQs features	Advanced web-search	Site-map	Video	Current Information
Zambia e-Gov Portal (http://www.zambia.gov.zm/)	Yes	Yes	No	No	No	No	Yes
Finance	Yes	No	No	No	Yes	No	Yes
Health	Yes	Yes	Yes	No	Yes	Yes	Yes
General Education	Yes	No	No	No	Yes	No	Yes
Labour and Social Security	Yes	No	No	No	Yes	No	Yes

The E-Participation Supply Index (EPI) provides essential information on the government's politico-cultural consultative mechanisms with its citizenry and information system. Zambia has some disparities in digital access and e-government service utilisation as evidenced by its EPI index score of 0.3559 (United Nations, 2016; Chatfield, & AlAnazi, 2013; West, 2015; Bwalya, 2015). This EPI score for Zambia falls below the global average of 0.4625 – thus more effort in encouraging civil society to engage in e-participation in Zambia is required. According to Zulu (2008) and Internet World Stats (2016), Zambia's internet penetration stands at 18% of the total population and sadly 80% of the population accessing the internet are concentrated in the Lusaka Province alone. This illustrates disparities in internet access and uses across towns and provinces, and this worsens as one move to rural communities were abject poverty has hit the hardest. Furthermore, widespread technophobia cases amongst the middle to high-income groups of the Zambian society have been reported (Bwalya, 2017; Bwalya & Mutula, 2016; Bwalya, Zulu, Grand & Sebina, 2012) – thus, education and outreach programs could be the solution for enhancing e-service adoption and utilisation.

Conversely, there are three decisive indicators for evaluating the demand-side of e-Government outreach, namely citizens' level of education, citizens' access to ICTs and usage patterns. Table

2-6 (generated from Knoema website, 2016) recaps Zambia's Information Society Report for these three indicators. In all the three areas of demand indicators Zambia remains subdued and with a mammoth task to turn around its fortunes.

2.7 In-depth Analysis of ICTs and e-Gov initiatives in Zimbabwe

Despite having complex dynamics entrenched in governance, social setups, and a tumbling and virtually collapsed economy, the nature and status of ICTs and e-government in Zimbabwe paint a totally contrasting picture. Against the backdrop of these challenges, Zimbabwe has witnessed some expansions in the ICT-backbone infrastructure, ICTs-for-education, ICTs-for-research and development. Similarly, Zimbabwe has seen rapid mobile penetration, establishment of community-based information and service centres, e-governance and human capital skills development. Having recognised the indispensable role of ICTs in the efficient and effective functioning of the public service, the Zimbabwean government adopted its first National ICT Policy in 2005 (Zim ICT Policy, 2014), which was later updated in 2014.

2.7.1 Analysis of Zimbabwe's e-Government Readiness

Zimbabwe's ICT awareness and acceptance date back to more than three decades when the then Rhodesian regime established two bodies; (Computer Society of Rhodesia and Central Computing Services) in 1976 to spearhead e-government initiatives. The establishment of a fully-fledged Ministry of Information Communication Technology (MICT) in 2008 to oversee ICT service provision to the general public and governmental organisations was a landmark gesture in accelerating ICT adoption in Zimbabwe. In addition to MICT, the government has established further ICT-umbrella institutions to initiate and collaborate in administering ICT for socio-economic growth. Such institutions include the Postal and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ), Ministry of Science and Technology Development (MSTD), Ministry of Transport, Communication and Infrastructural Development, Government Internet Service Provider (GISP), Government Telecommunications Agency (GTA), Transmedia (running the national radio and television infrastructures and services), Zimbabwe Academic and Research Network (ZARNET) and numerous subcontracted small to medium sized public-enterprises. Figure 2-6 demonstrates the

interplay of these government ministries and organisations in establishing an information knowledge society for Zimbabwe.

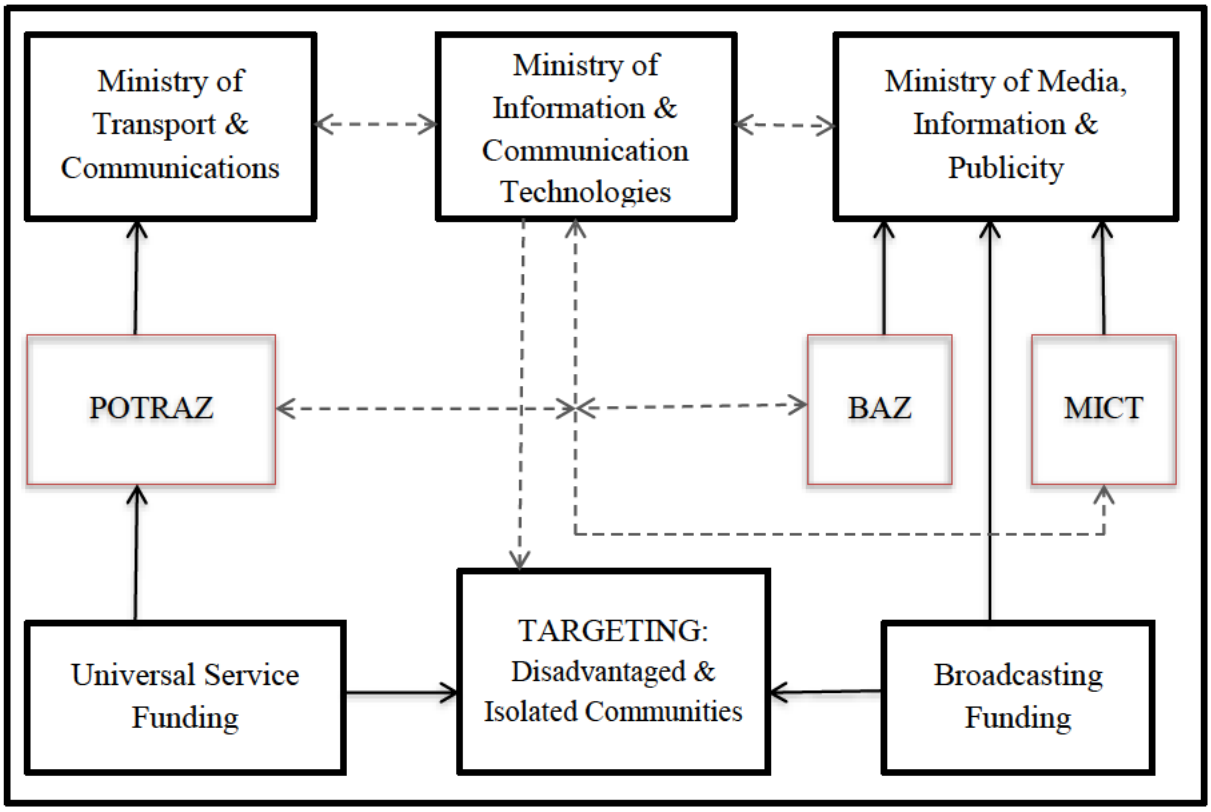


Figure 2- 6: Zimbabwe ICT-Sector Institutional interplay, (Source: Ruhode, 2013; MICT, 2010)

As illustrated in Figure 2-6, there are three foremost ICT regulatory organisations in Zimbabwe; POTRAZ, Broadcasting Authority of Zimbabwe (BAZ), and MICT. Each one of these public entities plays a decisive role in ensuring the smooth and efficient adoption of ICTs and e-government. Explicitly, POTRAZ is an umbrella government body whose mission is to govern the telecommunications sector, stimulate sustainable development and providing widespread communication services to all in Zimbabwe (POTRAZ, 2015). On the other hand, BAZ works closely with the Ministry of Media, Information and Publicity to regulate all aspects concerning broadcasting (legislation, licensing, technical standards and digital broadcasting). MICT oversees crucial aspects related to ICTs which include budget allocations, innovative reforms, ensuring sectorial development and growth (Ruhode, 2016). Other critical parastatals regulated by the Government of Zimbabwe (GoZ) and offering essential ICT service are Net*One, Tel*One, Powertel (previously ZESA) and Zimbabwe Broadcasting Co-

operation. Econet, Telecel, Africom, and BuddeComm are other vital private-owned mobile and internet service providers, also regulated by the government.

The next four sections discuss Zimbabwe's e-government readiness assessment guided by the four major e-government implementation toolkit dimensions.

2.7.2 ICT Infrastructure

The inception of the Government of National Unity (GNU) in 2008 witnessed phenomenal liberalisation and expansion of the ICT infrastructure in Zimbabwe worth millions of American dollars (POTRAZ, 2012). However, to have an in-depth understanding of the level of ICT diffusion within public administration, ICT and data access and usage by the general citizenry and business in Zimbabwe, the four major constructs of the ICT Development Index (Figure 2-5) of ICT readiness, intensity, impact and capacity are used.

Table 2- 9: Zimbabwe's ICT Development Indicators (2010 – 2015)

ICT Development Indicator for Zimbabwe	Units	2010	2014	2015
ICT Development Index (IDI)		1.970		2.900
ICT Development Index Rank		132.000		127.000
Access sub-index		2.090		2.890
Access Rank		142.000		139.000
Fixed-telephone subscriptions (per 100 inhabitants)	per 100 inhabitants	2.900	2.300	
Mobile-cellular subscriptions (per 100 inhabitants)	per 100 inhabitants	58.900	80.800	
International Internet bandwidth (Bit/s per Internet user)	Bit/s per Internet user	289.000	3,939.000	
Percentage of households with computer	%	5.300	7.600	
Percentage of households with Internet	%	4.000	5.800	
Use sub-index		0.550		2.030
Use Rank		118.000		112.000
Percentage of individuals using the Internet	%	11.500	19.900	
Fixed-broadband subscriptions (per 100 inhabitants)	per 100 inhabitants	0.300	1.000	
Active mobile broadband subscriptions (per 100 inhabitants)	per 100 inhabitants	4.700	39.200	
Skills sub-index		4.570		4.650
Skills Rank		130.000		136.000
Gross enrolment ratio, Secondary	%	47.200	47.200	
Gross enrolment ratio, Tertiary	%	6.200	5.800	
Adult literacy rate	%	83.600	86.500	

(Source: Knoema, 2016)

According to Table 2-9, the overall ICT Development index for Zimbabwe has remarkably increased from 1.970 in 2010 to 2.900 in 2015. Although there is a significant improvement in

IDI, Zimbabwe still trails far behind both the average score for emerging economies of 4.12 and a global average score of 5.03 (UN e-Government Survey, 2016). Furthermore, Zimbabwe records and EGDI score of 0.3472 in 2016, a decline from its 2014 score of 0.3585. Despite this decline, Zimbabwe's 2016 EGDI is still above both the average scores for the Africa region (0.2882) and below the world average score (0.4922) (UN e-Government Survey, 2016). Similarly, an e-participation index of 0.2881 for Zimbabwe falls below the global average of 0.4625 (United Nations, 2016). Ruhode (2016) attributed these gains in both IDI and EGDI for the period of 2010 to 2014 to the momentum gained during the GNU and the subsequent liberalisation of the ICT industry for new entries and massive mobile penetration (country-wide) that reduced the digital divide and boosted e-service utilisation. However, the decline in EDGI, as reported in the United Nations e-Government survey of 2016 could be attributed to the current economic challenges experienced in Zimbabwe.

The rate of internet penetration for Zimbabwe has slightly decreased from 45% (in 2014) to 41.4% (in 2017) (Internet World Stats, 2017). This has been attributed to the tumbling economy that is adversely affecting internet subscribers and utilisation levels. Closer analysis of internet access by households paints a dark picture; 5.8 out of 100 people accesses the internet through computers. Credit should be given to the massive pervasiveness of mobile cellular across the country; 80.8 out of 100 households own a mobile phone with access to the internet and this has dramatically increased accessibility and utilisation of internet and e-services in homes (Knoema, 2016). Nevertheless, diffeences exist in access to and utilisation of e-systems by citizens in Zimbabwe as one moves from metropolitan to rural areas (ITU, 2009: 13). Indeed, just like in many other developing countries; this is attributed to disparities in the level of affluence and ICT literacy between urban and rural dwellers. Furthermore, such comprehensive information on IDI and EGDI provides vital information for government decision making and evaluation of Zimbabwe's performance in ICT initiatives and points to areas requiring extra attention (Knoema, 2016). Since access to and use of the internet by individuals has a strong bearing on e-government utilisation, the Zimbabwean government has to pay great attention to increasing the percentages of households with internet access (5.8%), paralleled to 34.1% for developing countries and 46% for the world average (ITU, 2016).

Tariffs and allowability of e-services, specifically the internet in Zimbabwe, just like in most SADC member countries is unreasonably high for the majority of ordinary citizens. In order to promote e-government utilisation by the general citizenry, POTRAZ, in collaboration with

MICT should reduce internet tariffs. UNCTAD (2014) asserts that as some economies in most developing countries are declining, government focus tends to deviate to basic survival aspects like health delivery service, food, and security, cutting expenditure on ICTs and increasing levies on services through VAT and import duty. However, IMF (2017) underscored that most economies in the sub-Saharan region are fast-growing, with South Africa, Ghana and Nigeria cited as examples. Likewise, the Zimbabwean economy is undergoing similar economic turmoil since the end of the GNU in 2012 and the majority of the unemployed and self-employed citizenry is squeezed even further to allow high internet tariffs.

Despite the achievement made in Zimbabwe in ICT infrastructure as narrated above, the Zim ICT Policy (2014) draws attention to a host of other challenges encountered:

- **Inadequate communications infrastructure** – unavailability of broadband infrastructure in remote areas. Most e-government services are concentrated in major cities in Zimbabwe at the expense of rural areas. The government need some solutions to strike a balance.
- **Inadequate and ineffective ICT amenities** - effective ICT and e-government operations require a reliable power supply. Zimbabwe has been rocked by persistent power disruptions which hamper consistent e-government service provision. Long hours of power-cuts averaging 3-6 hours per day, at least three days per week have been reported and with the current drought and low water levels in the Kariba Dam and dilapidated Thermal national power station; the Zimbabwean government requires alternative power sources.
- **Insufficient ICT specialists** – Zimbabwe is rocked by inadequate skilled manpower to stimulate and spearhead ICT skills enculturation at grassroots levels (primary and secondary schools). Furthermore, the incessant mass exodus of ICT experts from Zimbabwe due to poor wages continues unabated.
- **Financial resource constraints** –it has already been explained in this chapter that the Zimbabwean government is undergoing difficult financial times as indicated by the desperate adoption of the multi-currency economy. As such, this has had a negative impact on the growth of the ICT sector, leading to its failure to avail state-of-the-art pervasive broadband services countrywide.
- **Inadequate policies and legal framework on the internet, data use, and privacy** – currently there is inadequate legislation to cater for legal and privacy matters arising

from internet and data misuse on online services in Zimbabwe and this triggers widespread uncertainty and resentments from the general public to engage with e-services.

- **Other challenges** point to poor outreach and awareness campaigns to create awareness the citizenry about the availability and usability of e-government services; inadequate and often very slow internet bandwidth connectivity which frustrates users' patience and desire to frequently utilise e-government.

2.7.3 Policy

The Zimbabwean government is very conscious of the significant role played by ICTs in shaping socio-economic pillars of the nation for national, regional and international participation. With this realization, the Zimbabwean government passed various ICT-related policy documents over the years to guide its course as delineated below.

The Nziramasanga Education Commission Report (1999)

The roadmap to building a Zimbabwean knowledge society dates back to the Nziramasanga Education Commission Report of 1999 (Zim ICT Policy, 2014) which recommends the mainstreaming of ICT-based pedagogy, starting from schools to university level. This is an essential ground-breaking report which paved way for all subsequent ICT policy documents produced. The UNESCO (2015) report on Building Inclusive Knowledge Societies, recommend that ICT and e-government awareness, access and utilisation be anchored in the national ICT strategic frameworks; as well as ensuring that practical implementation starts with the enculturation of ICT-skills at grassroots levels (primary and secondary schools).

National ICT Policy Framework (2014)

The National Information and Communication Technology Policy Framework (2014) is a review of the National ICT Policy Framework (2006) done in consultation with major stakeholders (mainly within the political arena) across the country and through the Zimbabwe e-Gov Portal to ensure people-driven final policy documents. The fundamental ideologies of the Zim ICT Policy (2014: 12) are contained in the Ministry of Information Communication

Technology's vision and mission statement: to build "a knowledge-based society with ubiquitous connectivity by 2020," and to "exploit the potential of ICTs for sustainable socio-economic development in Zimbabwe" respectively. Moreover, the Zim ICT Policy Framework (2014) provides essential information and pointers for the way forward for attaining its vision and mission:

1. Background information on all essential Policy documents adopted in Zimbabwe (whether enacted at national, regional or global context).
2. Major socio-economic growth pointers and ICT progress for Zimbabwe (focusing on key demographic, economic and ICT indicators). Further attention is drawn to challenges faced by the ICT sector in Zimbabwe.
3. The Policy framework – offers a strategic path, a legal framework, and roadmap for sustainable-nationwide ICT adoption. This constitutes the backbone of the Zim ICT Policy Framework (2014) covering the three major indicators of the ICT Development Index (infrastructure, access, intensity (ICT-use) and ICT capacity building).
4. ICT industry standardisation and interoperability – addresses issues of regulating all national e-services (e-Commerce, e-Health, e-Agriculture, e-Mining, e-Tourism, e-Government, e-Environment, e-Manufacturing, e-Transport and social networks) to achieve secure and trusted electronic data interchange and open government data exchange.
5. ICT Research and Expansion – lays down a countrywide collaboration amongst all key stakeholders (universities, researchers, research institutions, private and NGO organisations) to spearhead innovative and practical research.

The researcher acknowledges that the Zim ICT Policy Framework (2014) is a comprehensive document, necessary for the strategic adoption of e-government in Zimbabwe. However, its weakness lies in its failure to lay down a precise implementation strategy, especially against the background that it is a successor to the 2006 National ICT Policy Framework.

Strategic Plan (2010)

Extensively referred to as MICT-Visionary-Strategic Plan, the strategic plan was championed and geared towards providing vibrant e-government implementation guidelines (operations, processes, and procedures) for the nation. The Zimbabwean government through MICT adopted the ABCDE model (Figure 2-7) in an endeavour to understand the current ICT setup and then establish strategies to manoeuvre towards anticipated ICT goals and infrastructure.

Central to the ABCDE model are four crucial self-evaluation questions for the government in line with ICT initiatives: "Where are we? Where do we want to be? How will we do it? How are we doing?" (Ruhode, 2016: 4). Despite the ABCDE model being concise in laying-out 'dos', 'checks' and 'balance' for use in evaluating progress accomplished in e-government adoption, it remains an abstract blueprint requiring resource commitment and dedication from all concerned stakeholders to achieve desired results. Munyoka and Manzira (2013) suggested that most e-government projects in developing countries fail to achieve their intended goals due to failure by governments to align e-government policies with timely practical and contextual implementation.

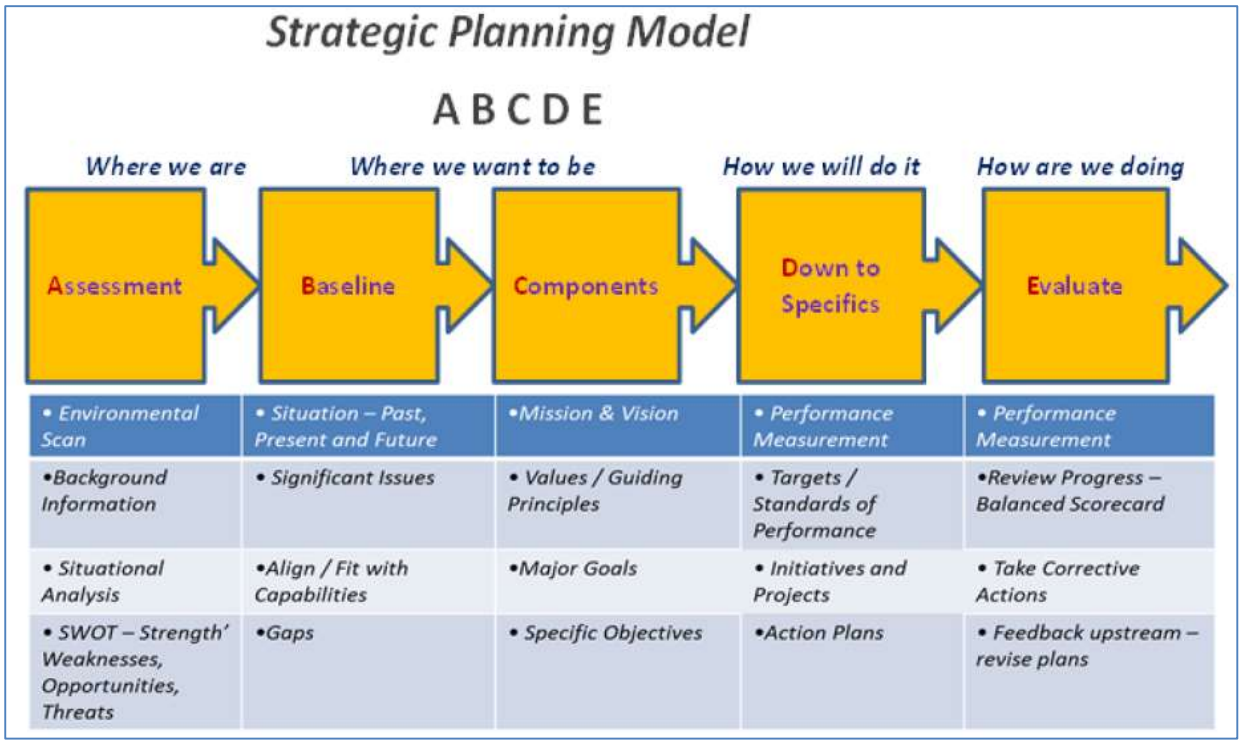


Figure 2- 7: ABCDE Strategic Planning Model, (Source: MICT, 2011; Ruhode, 2016)

National ICT Policy Framework (2006)

Ground-breaking initiatives for the National ICT Policy Framework commenced in 2001 through extensive consultations with all major stakeholders culminating in its subsequent adoption in 2006. The mandate of this policy document was to establish a unifying roadmap for traversing all economic sectors for the adoption of ICT initiatives under the vision of "transforming Zimbabwe into a knowledge-based society by the year 2020" and a mission

statement for "accelerating the development and application of ICTs in support of sustainable socio-economic growth and development in Zimbabwe" (National ICT Policy Framework, 2006:15).

Outlined below are the major goals of the National ICT Policy Framework (National ICT Policy Framework, 2006:15):

1. To guarantee the establishment and maintenance of ICT infrastructure,
2. To stimulate organized, appropriate and supportable growth for the ICT-industry,
3. To initiate widespread ICT-skills manpower development for all economic sectors,
4. To inaugurate sectoral initiatives to establish ICT-sector needs,
5. To ensure maximum and equitable access to and use of ICTs across the broader citizenry, as well as disadvantaged groups (gender-sensitive, disabled persons and the elderly).

The researcher observed that five years had since elapsed between policy inception and adoption; and this should be a matter of great concern for policy-makers, against the dynamic nature of ICTs and the viability and relevance of the policy document in line with emerging technologies.

Other National Policies and Programmes

Besides the major Policy Frameworks outlined above, the Zimbabwean government has adopted several ICT-related policy documents; thus signifying its obligation towards harnessing innovative technologies for socio-economic development and bolstering a knowledge-economy.

Table 2- 10: Summary of other ICT-Related Policies adopted in Zimbabwe

Policy Name	Brief Policy Summary	Year of Adoption
AU Summit Final Declaration on ICT Development	AU heads of states acknowledged and declared the ICT sector a top priority for economic development and a necessity public-utility for citizens.	2010

continues

Zimbabwe ICT Strategic Plan	Provides the roadmap for transforming Zimbabwe into an ICT-hub and for achieving a viable and vibrant economy.	2010
Short-Term Emergency Recovery Plan	Establishes a proposal for coming up with a Bill that harnesses the SADC ICT-model into the local telecommunications sector.	2009
National e-Readiness Survey	Catered for e-Readiness assessment for Zimbabwe along four barometers: ICT infrastructure, Policy, Governance, and Outreach.	2005
Zimbabwe Millennium Development Goals (MDGs)	The policy report aligned Zimbabwe's ICTs goals with UN's MDGs – that recognises harnessing ICTs to attain UN MDGs for member states.	2005
National Economic Recovery Programme	An economic turnaround strategy geared towards revamping the economy through diffusion of ICTs.	2004-2006
National Industrialisation Strategy	Focused on strategies for massive diffusion and harnessing of ICTs into the manufacturing sector to bolster output and exports of local goods and services.	2004
WSIS-Declaration and Action Plan	Endorses member states to embrace ICTs in policies for national agendas and socio-economic progression.	2003
Science and Technology Policy	Recognises and recommends harnessing of Science and Technologies into the national development framework.	2002

(Source: adapted from Ruhode, 2013)

Of significance is the realisation by policymakers of the indispensable nature and competitive role played by ICTs in both the domestic and global economy (World Economic Forum, 2015). Several policies, Bills, and reforms were adopted along the SADC regional block-framework to cater for national socio-economic agenda as outlined in Table 2-10.

2.7.4 Governance

The United Nations (2014a) suggests that "good governance and respect for fundamental human rights and basic freedoms are prerequisites for sustainable human development." Zimbabwe is a signatory to the UN Millennium Declaration whose mandate is to ensure that member states adhere to good governance in their strategic efforts to eradicate abject poverty. The Zimbabwe United Nations Country Team which collaborated with GoZ to establish the roadmap to sustainable and inclusive good governance has identified four major areas requiring immediate attention:

- Improving the rule-of-law and the national judiciary system,
- To bolster the state armoury dedicated to reconciliation-building; and conflict preclusion and control.
- To foster stringent accountability measures for administering service.
- Improve public involvement in autonomous civic decision-making processes.

The last decade has witnessed a meltdown of the Zimbabwean economy leading to massive unemployment standing at above 90% (UN, 2017), utter poverty, and self-employed sole traders. Furthermore, the United Nations Zimbabwe Report found that GoZ is performing badly in all the four identified Governance areas above. These findings agree with Knoema's (2016) Worldwide Governance Indicators in Table 2-7. Knoema (2016) suggest that Governance Indicators should range between -2.5 and +2.5. Negative values show bad governance, while positive values are an indication of good governance. Out of the six sample states measured on Governance Indicators, Zimbabwe is performing miserably in all the six indicators. Of great concern is the failure by the government to curb the level of corruption amongst public officials; increasing from -1.3061 in 2010 to -1.3887 in 2014. This reveals increased levels of corruption. Moreover, several studies (Ndoma, 2015; Bonga, Chiminya & Mudzingiri, 2015; Transparency International, 2013) suggest that corruption in Zimbabwe has become an acceptable way of life; systemic in nature and requires a systematic approach to eradicating.

Furthermore, Table 2-7 illustrates Zimbabwe attaining the lowest score values (-1.2774) in the voice and accountability indicators compared to the other five sampled nations. According to UNDP (2010), the voice of the ostracised and marginalised citizenry should be empowered through inclusion and participation in national e-governance policy and decision to guarantee system and policy ownership. Furthermore, by giving the public an opportunity to voice their

contribution in national issues, gives them a leverage to know what is transpiring in government and to question public official for accountability – thus cultivating transparency.

However, in Zimbabwe, the marginalised groups are continuously repressed by tyrannical propensities that culminate into human-rights abuse claims and outcry (Human Rights Watch, 2015; Transparency International, 2013; Makwerere, Chinzete & Musorowegomo, 2012). The researcher identifies this stance of 'citizenry-inclusion' in the decision-making process (only in the policy document) and 'citizenry-exclusion' (in practice) as a major hindrance to e-government adoption and utilisation. Subsequently, this 'citizenry-exclusion' in matters of national interest contributes significantly to the lack of e-service awareness, loyalty, and uptake by citizens, resulting in high e-government project failure reported by Heeks (2003c) and ITU (2008) for most developing countries.

2.7.5 Outreach

As indicated in Section 2.6.5 and consistent with evaluating the supply-side of e-government outreach, studies conducted by Zinyama and Nhema (2016); Hikwa and Maisiri (2014) point to the unavailability of statistics on citizens' satisfaction with e-government services. Most studies conducted on e-government in Zimbabwe concentrate more on adoption (Ruhode, 2013, 2016; Bwalya & Healy, 2010; Mzyece, 2012); access and challenges (POTRAZ, 2015; Rajah, 2015) at the expense of utilisation and satisfaction (Danila & Abdullah, 2014; Yaghoubi et al., 2011; Chatfield, & AlAnazi, 2013). The greater impact of small-community-based projects, often spearheaded by the private sector has been reported in rural areas of Zimbabwe (Musiyandaka, Ranga & Kiwa, 2013). The biggest breakthrough in e-government was realised in mobile money transfer (Fengler, 2016; ITU, 2013c) and increased utilisation of plastic money for food purchase, insurance cover and purchase (Chibango, 2014; Mago & Chitokwindo, 2014). Representative agencies (kiosks for Eco-cash, Eco-food, EcoSure, OneWallet, and TeleCash) have been established countrywide, including in the most remote communal centres and growth points (POTRAZ, 2015; Ndlovu & Ndlovu, 2013). The researcher has noticed with great concern the absence of donor agencies in Zimbabwe to champion community-based e-government projects targeted at addressing problems in line with service needs and ICT skills. Equally observed by the researcher is the absence of studies

focused on absolute assessment (qualitatively or quantitatively) of user-satisfaction with e-services – thus calling for further studies.

The seven website usage-enhancing features identified in section 2.6.5, Table 2-11 shows that the Ministry of Public Service, Labour, and Social Welfare websites having nearly all major website usage-enhancing features. Just like the ministerial websites scrutinised, the Ministry of Public Service, Labour, and Social Welfare website excludes advanced web-search features to allow website-users refined information searching. Besides falling short in FAQs and advanced web search features, the Zimbabwean e-government portal is a true 'one-stop-website' with links to all crucial government services. Additionally, the researcher noted that the Zimbabwean e-government portal, just like all the other scrutinised ministerial websites, is still in its enhanced-maturity phase (UN Public Administration Programme, 2010); permitting basic two-way communiqué services (emails, downloadable forms, and search engines). This study calls for further government commitment in rolling out transactional e-/m-Government services for the inclusive benefit of the broader citizenry.

Table 2- 11: Web Measure index for Zimbabwe's five Ministerial Departments

Ministerial Department	**Web Measure index (usage-enhancing website feature available?)**						
	Contact Us	Search facility	Help & FAQs features	Advanced web-search	Site-map	Video	Current Information
Zimbabwe e-Gov Portal http://www.zim.gov.zw/)	Yes	Yes	No	No	Yes	Yes	Yes
Finance & Economic Development	Yes	Yes	No	No	Yes	Yes	Yes
Health & Child Care	Yes	No	No	No	Yes	Yes	Yes
General Education	Yes	No	No	No	Yes	Yes	Yes
Public Service, Labour, and Social Welfare	Yes	Yes	Yes	No	Yes	Yes	Yes

UNDESA's UN E-Government Survey (2014) has identified three decisive indicators for assessing the demand-side of e-government outreach, namely citizens' access to ICTs, usage patterns and citizens' level of education. Table 2-8 (generated from Knoema website, 2016) recaps Zimbabwe's Information Society Report for these three indicators. In-line with citizens' access to ICTs, Zimbabwe scores an average value of 2.890, way below the world (5.53) and developing nations (4.66) average scores (ITU, 2015: 47). Zimbabwe records an average score of 2.030 on the IDI use sub-index; likewise, falling short of the world (3.64) and developing nations (2.62) standard scores. The ITU (2015:49) shows that Zimbabwe averages 4.650 IDI skills development – again way off the world (6.81) and developing nations (6.06) moderate scores. Overall, Zimbabwe ranks number 134 out of 193 UN member states. Zimbabwe's performance in IDI remains subdued and confirms assertions by the UN e-Government Survey (2014:43) that the digital, access and utilisation divide is prevalent and remains an obstacle in

most developing countries' efforts to a sustainable knowledge society. The review of literature correlates the complex political trajectory that has rocked Zimbabwe for the past decade with this implausible IDI index scores. This research advocates a multivariate stakeholder consultative approach to turn-around the current poor performance in e-government adoption.

2.8 Critique of the literature: identify the Research Gap

A thorough analysis of the dedicated efforts and progress made to transform societies and public service delivery systems in Zambia and Zimbabwe draws attention to the significant challenges confronting the nations in general and the SADC region in particular. Evidently, there is the political will to transform nations into a knowledge society. However, there are challenges such as excessive government monopoly and failure to liberalise the ICT sector, poor planning in human capital development and retention strategies, constrained and often misappropriated financial resources, poor and frequently dilapidated ICT-infrastructure and; an unclear and commonly absent framework transforming ICT. There is a need to implement e-government policies timeously while the solutions are still relevant to societal needs.

The analysis of literature in this chapter has exposed gaps which will be analysed using two analysis approaches: the SWOT analysis and Atuahene-Gima's (2004) four-stage research gap analysis.

2.8.1 SWOT Analysis for the Case Study based on Literature

The SWOT analysis technique has been widely used by decision makers for ICT and e-government adoption strategic planning. In the context of e-government, policymakers should evaluate the local context settings of e-government adoption in line with its 'Strengths', 'Weaknesses', 'Opportunities' and 'Threats' so as to increase chances of e-project success and to identify failure points in organisational strategic planning. Heeks (2003c) says that beneath the decorative-hi-tech fascination with e-government adoption lies disturbing realities of high project failure rate for most developing countries.

Moreover, Heeks (2003c) underscores the essence of public policy makers involved in e-government and ICT projects to understand 'why?' e-government projects fail and 'how?' best

to make e-government projects successful; and finally, use existing experiences in regional failure/success rates for spearheading effective e-government projects. According to Heeks (2003:2), 35% of e-government projects end in total failure (no implementation at all or partial implementation that was abruptly abandoned), whilst 50% remains a partial failure (some implementation took off, but failed to attain major project goals leading to substantial objectionable consequences); yet only 15% reported success (major stakeholders to the project are contented with attainment of project goals). Against this backdrop of high e-government failure, the SWOT analysis provides an instrument for mapping from policy to implementation as outlined below.

Strengths

- The 2001 SADC declaration on ICT by heads of states in Blantyre, Malawi, to acknowledge and embrace the catalytic role of ICTs to transform societies and bridge the digital-divide gave birth to the current rapid propagation of ICTs. For both Zimbabwe and Zambia, major reforms and initiatives in the ICT sector have been implemented, as witnessed by the liberalisation and large-scale registering of licenced communication providers in Zimbabwe (POTRAZ, 2016; Zim ICT Policy Framework, 2014); and widespread government-private sector collaborations in community-based e-government projects in Zambia (van Stam & van Greunen, 2014; Macha Works, 2016). Successful partnerships and growth in ICT and e-government projects are reported in various studies for both countries (Bwalya, 2012; Ruhode, 2016; Knoema, 2016).
- Major milestones and strengths for both Zambia and Zimbabwe lie in having sound ICT policy documents in place for a roadmap to attain various national strategies and visions. Zimbabwe's vision 2020 (pronounced in 1999) announced massive exploitation of ICTs to attain sustainable national development; whilst the Zim National ICT Policy Framework (2014) provides a vivid agenda for the proliferation of ICT infrastructure and its maintenance, embarking on a massive human capacity development to ensure there are adequate skilled personnel to spearhead sectorial-ICT application, stimulate innovative research in ICT and encourage SADC regional integration in ICTs. The determination by the Zambian government to enact the National ICT Policy in 2006, followed by The Information and Communication

Technologies Act of 2009 indicate that ICTs are a pivotal catalyst to attaining national agendas and economic growth through enculturation of a twenty-first knowledge society.

- The Zimbabwe government's MICT Strategic Plan (2010), commonly referred to as the ABCD model, assisted public policy makers to establish the current ICT roadmap and progress against established goals to determine further correctional and expansion plans. Moreover, the model provides a blueprint for checks and balances in leveraging e-government adoption in the country.
- Inroads in human capacity development in ICT skills were logged in both countries through orientation and teaching of ICTs starting from the grassroots levels (primary to secondary) up to tertiary institutions in which basic ICT orientation courses are mandatory to all students. Furthermore, the liberalisation of the mobile cellular sector witnessed massive cell phone ownership by citizens; thus creating a conducive environment for the thriving of m-government. All this intensifies the attainment of national strategic goals of building information and knowledge-based societies.

Weaknesses

- Despite enjoying some noticeable ICT and e-government progress, both Zambia and Zimbabwe continue to risk suffering total or partial failure in e-government due to the absence of clear and practical implementation strategies. Against the backdrop, e-government adoption faces severe challenges in transforming abstract statements in ICT policies into practical implementation – some trial and error executions are inevitable and have been observed in both countries. Such an approach in adoption may yield results in the short run, but fail in the long run due to lack of clear implementation vision.
- Weaker and often subdued economy is one of the foremost hindrances to e-government adoption. Zimbabwe is undergoing serious economic turmoil with a negative effect on ICT progress as evidenced by stagnant and poor performance in both IDI and EGDI score (Figure 2-5).

  Likewise, Zambia has her challenges – budget deficits meant that developmental and social projects consume a large chunk of the budget at the expense of sectors like ICT and e-government.

- Bad governance and stifling of citizen voices and freedom of expression have been reiterated by Knoema (2016) and The World Bank (2016b) for both Zimbabwe and Zambia. In actual fact, Zimbabwe and Zambia score the lowest Governance Indicators out of the six countries (Table 2-7). Poor governance has dire consequences for e-government acceptance and utilisation by citizens who habitually may regard themselves as outsiders to public policy making and e-government projects. Furthermore, trade embargos and sanctions imposed on Zimbabwe by the West for bad governance and human rights abuse for more than a decade resulted in donor-isolation, a deteriorating economy, and diminishing ICT competition.
- There is limited access to e-services in rural remote areas of both Zambia and Zimbabwe where more than 70% of citizens reside. High ICT illiteracy rates and massive unemployment mean the people could not enjoy the benefits of e-government initiatives in these countries. Instead, such citizens will opt to endure long queues in search of face-to-face services delivery at government offices – thus fuelling corruption. Oppressed people have little faith in their regime and as such, lack trust in the government and e-government systems and this explains their general resistance to adopting and utilising e-services.
- Lack of e-government awareness campaigns and outreach programs to educate citizens on how to use and the benefits of using e-government services are problematic. This explains why some affluent citizens continue to shun emerging digital devices and online services like e-Banking, e-Government, and m-Government. Governments tend to engage the political elite in ICT decision-making at the expense of the general public.
- Data currency and accuracy on e-government websites discourage the public to utilise such services. Sometimes national portals contain inconsistent, stale and incomplete data like dead-links on e-government websites. This problem is compounded by a lack of impact assessment of e-government projects to determine user needs and satisfaction to encourage continuous service utilisation and loyalty.

Opportunities

- Aggressive adoption and penetration of mobile technologies in both Zimbabwe and Zambia have created new opportunities for e-government in the area of m-government.

POTRAZ (2015:11) announced a massive 90.3% mobile penetration rate; whilst internet penetration level dropped from "45% to 44.3%" for Zimbabwe for the first quarter of 2015. On the contrary, BuddeComm (2016) indicates a 75% mobile penetration rate. The Internet World Stats (2016) announced an 18% internet penetration for Zambia as at the last quarter of 2015. Taking advantage of the presented m-government opportunities led to the proliferation of mobile money transactions in Zimbabwe and successful community-based mobile projects like Mwana m-health program and Linknet's rural Macha community internet-connectivity.

- There has been an introduction of ICTs and e-government initiatives from grassroots to universities in both rural and urban areas. This has increased demand for various e-government services and encouraged governments to launch in-demand community-based projects aimed at addressing local-context problems using vernacular languages. Such government initiatives continue to contribute positively towards building a knowledge society – thus contributing towards meeting national ICT strategic goals, vision, and agendas.
- Launching of national e-government portals in Zimbabwe and Zambia provides essential channels for citizen participation decision-making processes. A user-friendly national e-government portal, coupled with targeted awareness and outreach campaigns encourage citizens to adopt and utilise e-government services.
- The Zambian government liberalised the ICT sector to pave way for collaboration between the public and private sector, public and NGOs. Such co-operation has resulted in numerous ICT projects targeted at linking-up remote, rural communities with the rest of the country through e-participation. The burgeoning of WIFI-connected Econet and Telecel money-transfer kiosks across Zimbabwe (including the most remote rural areas) avails opportunities for the government to enter into public-private partnership by utilising the existing infrastructure (kiosks) to rollout e/m-government services at community level.

Threats

- More than a decade of political turmoil, economic downturn, enacting of adverse industrial policies has witnessed the exodus of foreign-owned companies and scepticism by direct-foreign-investors to set-up businesses in Zimbabwe. This has

resulted in more sanctions, international isolation, stagnant-economic-growth, poor living standards and noticeable service deterioration in the ICT sector. The e-government adoption momentum was spared by these challenges.

- There are insufficient highly-skilled ICT professionals in the government sector to champion successful e-government projects. Implementation is one major failure point of e-government initiatives in both countries. Ultimately, this led to the failed implementation of ICT projects and sometimes, abandoned projects. Therefore, a project champion will link public, strategic e-government goals with the private sector and NGO funding.
- The proliferation of digital devices with internet capabilities and delivery of ICT pedagogy in schools are inevitably concentrated in affluent urban areas of both Zimbabwe and Zambia. Sooner or later, the governments are confronted with widening digital divide challenges and e-inclusion barriers to resolving. However, with constrained economies, this remains on the national ICT policy agenda for both countries.
- Endemic corruption and nepotism in the awarding of tenders for ICT projects lead to inferior government-centric ICT project implementation and sometimes non-implementation of projects. This has significantly contributed to the number of reported ICT project failures.
- There has been a continuous bureaucratic regulatory system that is not responsive and is insensitive to adopting innovative technologies essential for effective e-government adoption and service demand forecast, failure to integrate cloud computing, business analytics, open data and interoperability and public-service ICT outsourcing. Such innovative technologies are indispensable in bolstering secure e-government systems required for earning citizen trust with e-services.

2.8.2 Research Gap Analysis

The literature review in previous sections in this chapter exposes several research gaps. By adopting Atuahene-Gima's (2004) four-stage research gap analysis, the study seeks to scrutinise "theoretical, empirical, contextual and substantive" (Hassan, 2011:61) research gaps on e-government adoption. Theoretical research gap is concerned with unsatisfactory

clarification and forecast of specific occurrences and often tries to answer the "why?' question. Empirical research gap pertains to the absence of first-hand studies and inconsistent outcomes. The thrust of contextual gap analysis is on the generalisability of research findings. Whilst substantive gap denotes the absence of managerial understanding of 'how' to procedurally execute tasks. Figure 2-8 illustrates the taxonomy of research gaps analysis.

2.8.2.1 Theoretical Gap Analysis

The literature review on e-government in Zambia, Zimbabwe, and the SADC region show that sound ICT policies have been crafted and adopted (Bwalya & Healy; 2010; SADC Report, 2015; Ruhode, 2016). However, what is lacking is a clear vision and guidelines for project implementation. Moreover, a SWOT analysis draws attention to the weaknesses and threats to e-government adoption by the government; acceptance and utilisation by the citizenry, and yet there are no satisfactory explanations and mechanisms in place for overcoming these challenges. Essentially, under such a scenario and as evidenced in this chapter and elsewhere in many related studies (Al-Shboul et al., 2014; Majdalawi et al., 2015; World Economic Forum, 2015a), the little gains in ICT infrastructure and e-government initiatives could be easily eroded due to many internal (for instance delayed implementation, how to address low acceptance levels) and external (low e-service acceptance by citizens, lack of awareness) forces. Therefore, there is a need for coming up with a novel all-inclusive e-government adoption and utilisation conceptual model relevant to a developing countries context that can be used by policy and decision makers on e-governance maters.

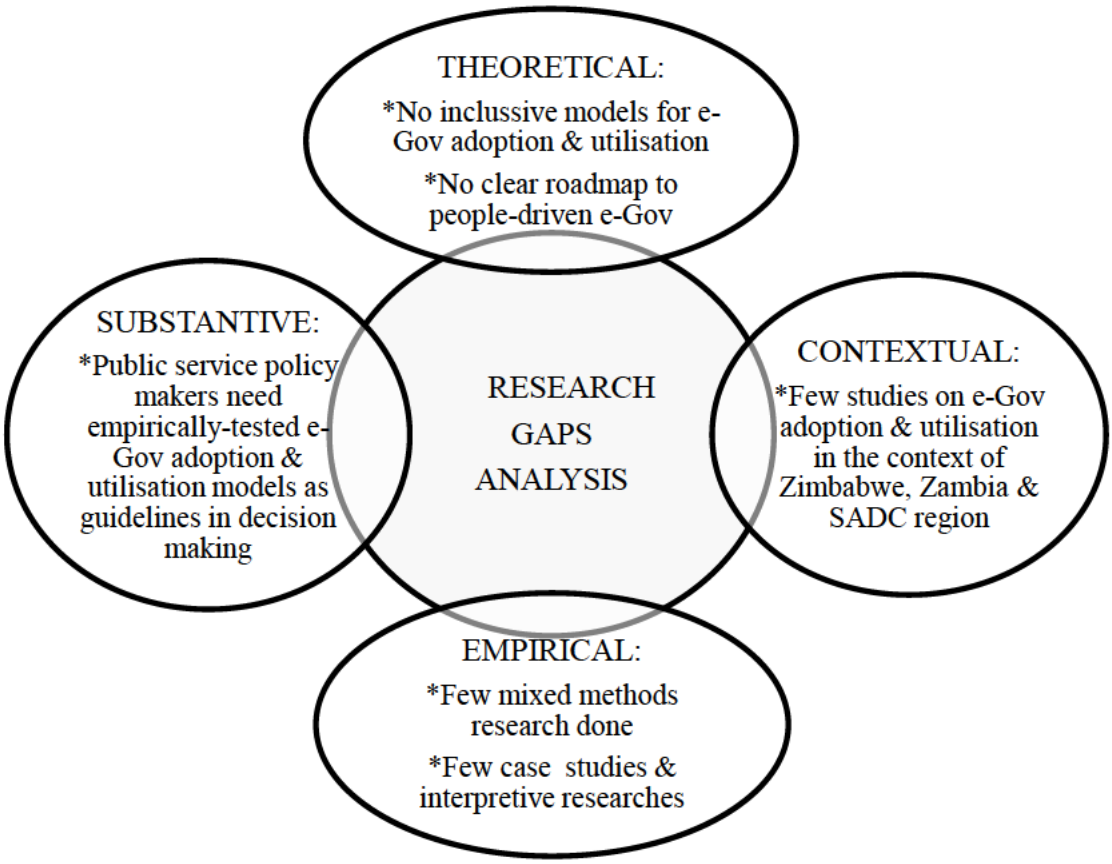


Figure 2- 8: Research-Gaps Analysis Taxonomy, (adapted from Hassan, 2011)

2.8.2.2 Contextual-Gaps Analysis

There are limited studies done on e-government adoption for the SADC region focusing on the G2C domain and utilising mixed methods research design. For instance, Bwalya (2012) investigated e-government adoption using the Zambian case study and focused on both the G2C and G2B domains. Other studies done in the SADC region include Ruhode (2013), focused on a G2G domain using Zimbabwe as the case; Mukumbareza, (2014) focusing on G2C using Tanzania as the case study; Komba-Mlay (2013) focuses on factors affecting rural citizens' access to e-government in remote villages of Tanzania. However, most of these studies use isolated individual cases (countries) to analyse the factors hindering e-government adoption. Therefore, the researcher calls for empirical research on e-government adoption and utilisation for the G2C domain using explanatory mixed methods design and covering more than one SADC country.

Empirical findings could provide a realistic basis for transferability and generalisation of the e-government adoption and utilisation findings across the SADC region.

2.8.2.3 Empirical Gap Analysis

There are a few studies utilising a mixed method research strategy to examine e-government utilisation levels by citizens in Zimbabwe and Zambia. It has been noted in many studies and in this chapter that most e-government projects in developing countries emanate from the 'supply-driven' strand; and yet very few empirical studies exist that investigates citizens' perspectives on factors affecting e-service acceptance and utilisation. Typically, how governments can promote 'people-driven' e-government initiatives. Consequently, this study seeks to fill that research gap by pursuing to understand the factors that motivate and hinder citizens' willingness and capacity to adopt and use e-government systems in the SADC region.

2.8.2.4 Substantive Gap Analysis

The high failure rate of ICT projects has been discussed extensively in the extant literature and identified here. Therefore, this study seeks to propose a 'people-driven' e-government adoption and utilisation conceptual model that could be used in e-governance decisions by the authorities. In addition, such a conceptual model should provide pointers to e-government adoption and utilisation enablers (catalytic factors) required for crafting and rolling-out context-based e-government solutions to address local problems.

2.9 Chapter Summary

This chapter answered research questions one and two; and objective one based on analysis of existing literature concerning e-government initiatives put in place by governments of Zimbabwe and Zambia to empower citizens through access to government services using online mechanisms. These research questions were answered through eight diverse, but related sub-sections. The chapter scrutinised the e-government movement and the impetus by governments across the world in adopting e-government.

The chapter drew attention to the e-government movement and concept as a multidisciplinary phenomenon which cut across social, political and economic spheres; over and above technological infrastructure for it to thrive. Contrast has also been drawn between e-Commerce and e-government to eliminate any confusion for the reader. A thorough discussion of e-government domains, such as G2G, G2B, G2C and G2E was presented to explain how governments can link-up with and channel their e-government efforts with different stakeholders. Reflection on e-government maturity models paints a changing dimension in assessing the growth of government portals - the linear approach to implementation. Benchmarking does not work anymore due to emerging challenges inherent in multichannel accessibility that is impeding e-government adoption and utilisation.

The chapter also discussed e-Readiness assessment in line with e-government adoption in a top-down, funnelling approach, starting at the global level focusing on developed versus developing countries, then the African continent, followed by the SADC region and finally the Zimbabwean and Zambian contexts. The ITU e-Government implementation toolkit, e-Government Development Index, and ICT development index assessment tools were used to evaluate the progress made in terms of adoption by the government; acceptance and utilisation by citizens; and impact of e-government initiatives on the socio-economic status quo. Studies have established that e-government adoption for most developing countries and some notably developed countries face challenges. Chief among them relate to poor and often dilapidated ICT infrastructure, delayed ICT policy implementation, bad governance, and prevalent low ICT literacy rates which often create fertile ground for non-acceptance of e-services, and frail outreach programs to create awareness the citizens on the availability of and benefits of using e-government systems. Out of this investigation, findings exhibit that any complacency and ignorance by governments to respond to these challenges could precipitate e-government project failure (either total or partial failure). Currently, Zimbabwe is undergoing severe political and socio-economic challenges which have hampered ICT and e-government progress. Despite this, the prospects for enhancing e-government adoption are still bright as indicated by its comparably intermediate EGDI and IDI regional and international scores. Likewise, Zambia's transformation to a knowledge society through e-government adoption is on the course as witnessed by improved scores on both EGDI and IDI indicators – credit must be extended to NGO and private-sector funded community-based e-government projects.

The chapter concluded by critiquing the literature that identifies research gaps using the SWOT analysis technique and the Research-Gaps Analysis Taxonomy. Chief among the noticeable weaknesses for both Zimbabwe and Zambia are the prevalent lack of awareness of e-government initiatives by the general citizenry and high cost of internet bandwidth. Successful e-government adoption requires active participation and buy-in by the citizenry of ideas from all stakeholders during decision making, implementation and at system utilisation and ownership phases. In essence, this analysis substantiates this study by answering research question two on major factors affecting citizens' adoption and utilisation of e-government in the two countries. Four major research gaps have been established: theoretical (lack of all-inclusive e-government adoption and utilisation models), contextual (limited studies on e-government utilisation in the context of Zambia, Zimbabwe and the SADC region), empirical (few case studies using mixed methods research) and substantive (lack of empirically-tested e-government utilisation models as guidelines for policymakers in decision-making process).

The next chapter (3) builds on issues raised in this chapter by deliberating on different mechanisms, models, and frameworks that could be used to assess the adoption, utilisation and effectiveness of e-government initiatives. The chapter will also establish the suitability of such models in evaluating and guiding the adoption and utilisation of e-government initiatives in the context of developing nations.

Chapter 3: E-Gov Adoption Models, Conceptual Model and Hypotheses Development

Chapter Overview

This chapter analyses existing e-government adoption, acceptance and utilisation models and then proposes the initial conceptual model and hypotheses for the study. It also seeks to understand the limitations of existing models and frameworks in assessing e-government utilisation in the context of developing nations. This chapter also addresses the core indicators and success factors for assessing e-government utilisation.

3.1 Personal Factors Affecting e-Gov Adoption and Utilisation

E-Government is a multi-dimensional concept that requires a multiple stakeholders approach its implementation and adoption. Drawing from literature on e-government adoption (Ndou, 2004; Heeks, 2003b, 2003c; Elkadi, 2013), it is evident that e-government projects can either fail for various reasons. Elkadi (2013) identifies three major types of failure: project failure, system failure and user failure. Project failure is where the entire e-government initiative is not successfully completed due to budget constraints, being abandoned for some other reasons and this is mainly associated with and attributed to the organisation. In system failure, the e-government project is successfully completed and rolled out but the system fails to meet user requirements and as such people avoid utilising the e-services. In contrast, user failure is a scenario in which the targeted end users of an e-government system fail to adopt and utilise the e-services due to lack of awareness of the e-service or due to lack of ICT skills to use such services. Moreover, Elkadi (2013) identified citizen involvement and consultation on e-government matters, providing allowable internet data bundles and a culture of creating awareness amongst citizens by the government and government agencies on the importance and benefits of using e-services as some of the fundamental ingredients for successful e-government projects in developing nations.

More specifically, in situations where e-government adoption is voluntary, governments should focus on offering e-services that are required by citizens. Countries like the Republic of Korea,

Australia, and Singapore are ranked highly for having successful e-government strategies that promote both access and utilisation (United Nations, 2016). With this knowledge of success in the adoption of e-government in industrialised nations, this inquiry probes factors that lead to the successful adoption and utilisation by ordinary citizens and whether the same strategies could be replicated in developing nations. As noted in Chapter 2, factors such as awareness, accessibility, security, the level of knowledge (which is associated with perceived ease of use), perceived confidentiality and perceived usefulness, significantly influence one's decision towards accepting and utilising e-government systems. In addition to these factors, organisational factors (ICT infrastructure, e-government outreach strategies, policy, and governance) (ITU, 2009), and citizens' individual beliefs have a substantial impact on the utilisation of e-government systems (AlAwadhi & Morris, 2009; Alsaif, 2013). Literature suggests that underlying the inadequacy of understanding citizens' acceptance and use of e-government systems in developing countries, rests the need to first understand various personal and population factors:

1. **Age** – Al-Shafi and Weerakkody (2010) suggest that citizens' age and their level of education clarifies dissimilarities among adopters and non-adopters of e-government systems. Studies that were done by Colesca (2009), and Chen and Zhang (2011) established a correlation between age and e-government adoption. However, in the context of the SADC region, other researchers (Nkohkwo & Islam, 2013; Asogwa, 2011; Dombeu & Rannyai, 2014) call for more studies to be done to ascertain the relationship between age and e-government utilisation.
2. **The level of Education** – A person's level of computer and information literacy can influence his or her intended use e-government services (Alateyah, Crowder & Wills, 2014). Furthermore, Alateyah et al., (2014) suggests that people who grow up in educated families with access to technology and the internet have higher chances of adopting e-government. Venkatesh et al., (2003) state that there is a positive correlation between a citizen's level of education, technology ownership, and the actual usage.
3. **Socio-cultural influence –** socio-cultural factors include cultural influences, culture awareness, and national culture which influence citizens' intentions to adopt and use e-government services (Akkaya, Wolf, & Krcmar, 2012).

   Researchers draw attention to the fact that socio-cultural pressures have a strong impact on e-government adoption and utilisation in circumstances bearing solid cultural standards and social forces (Ali, Weerakkody, & El-Haddadeh, 2009; Al-Hujra, Al-dalahmeh, & Aloudat, 2011). For instance, socio-cultural influence is relevant in the

SADC region in contexts such as universities, workplace set-ups, amongst women, within social groupings, religious and professional groups where peers influence each other to use e-government service.

4. **Prior Experience -** Studies have shown that in circumstances where a citizen has previously used a computer, smart device, the internet or e-government services, chances are high for repeated use in the future if the experience was pleasant. Cooper et al., (2008) argue that the continued use of e-government comes with a high degree of trust in the system. Moreover, Bélanger and Carter (2008) posit that citizens' previous involvement (whether positive or negative) with e-government systems; have a strong bearing on their willingness to comply, support government policies; and their future decisions on the adoption and utilisation.
5. **Motivation** – At both personal and social levels, motivation plays a pivotal role in the drive to use e-government. Bwalya and Mutula (2014) posit that if developing nations are to boost the utilisation of e-government by citizens; they should determine the drivers for the acceptance and utilisation of e-services.

The impact of individual factors on e-government adoption is well-documented in the literature (Davis, 1989; DeLone & McLean, 1992; Venkatesh & Davis, 1996, 2000; Kumar, Mukerji, Butt, & Persaud, 2007). Within the G2C domain of e-government, understanding individual factors affecting the uptake of such e-services assist policy makers to unveil people/community-centric, on-demand e-government systems. In a synchronised study done by Stanforth (2006) on e-government adoption in developing countries using the actor-network theory, it was discovered that the behaviour of individual actors (citizens), coupled with contextual setups, influences one's decision to accept and utilise e-services. In the realm of e-government adoption, the government must identify critical success factors affecting the acceptance and continued utilisation (Khanh, Trong & Gim, 2014; Rabaa'i, 2015, Munyoka & Manzira, 2014; Papadopoulou, Nikolaidou & Martakos, 2010). Some of these factors include trust (trust of the internet and trust of e-government), perceived public value/usefulness of e-government services, perceived ease of use and supporting structures for outreach to citizens.

In crafting the agenda for e-government adoption and utilisation, tailored for developing nations, there is a need to factor in strategies that accommodate individual factors which influence citizens' decisions regarding e-government utilisation and pertinent to

developing nations. Worth noting is the fact that e-government strategies are multifaceted, complex and not national policies per se; but strategies for social inclusion of the ordinary citizens to voice their participation in e-government projects (Bwalya & Mutula, 2014; Sahraoui, 2007). Some studies (Ruhode, 2016; Njuru, 2011; Habeenzu, 2010) have articulated the indispensable need for policies that strike a balance between people-driven and e-government technological advances in order to promote e-government proliferation and continued uptake. Furthermore, Bwalya (2011:110) argues that for ICT policies to be effective in attaining the e-government agenda, they should clearly define "the role of private sector, Civil Society Organisations (CSOs) and Government and provide a roadmap for harnessing ICTs for addressing the development problems being faced by the country."

3.2 Effect of Privacy, Security and Trust on E-Gov Adoption and Utilisation

Alateyah, Crowder and Wills (2014) suggest that perceived lack of privacy and security on e-government systems by citizens in developing countries is one of the major contributing factors for the lack of trust on such e-services. Subsequently, several studies (Fakhoury & Baker, 2016; Papadomichelaki & Mentzas, 2012; Shalhoub, 2006) have cited privacy, security and trust issues as having a significant impact on the levels of e-government utilisation by citizens:

3.2.1 Privacy

According to Papadomichelaki and Mentzas (2012:100), privacy is concerned with the "protection of personal information, not sharing personal information with others, protecting anonymity, secure archiving of personal data, and providing informed consent." The dynamic nature of the ICT field and the internet is always posing new ethical and security challenges that lead to the building of anxieties by e-service customers. To overcome such privacy worries, many studies (Shalhoub, 2006; Xu et al., 2009; Bansal et al., 2010) advances some remedies: inco-operation of privacy statement on e-government websites addressing all fundamental privacy principles, compensation mechanisms for offended customers, government regulation and ICT self-regulation for enforcing procedural justice for perpetrators. In a study done by Zhou (2011), privacy concerns were found to have a significant influence on citizens'

behavioural intention to adopt e-services. Therefore, to promote e-government service adoption and utilisation by citizens, governments in the SADC region should guarantee the privacy of personal information, data and transactions by eliminating government surveillance censorship, and overcome perceived risks.

3.2.2 Security

Security is concerned with managerial and technical procedures associated with protecting data and information against possible losses, "unauthorised access, destruction, use, or disclosure" (Shalhoub, 2006:272). In the context of e-government, managerial issues are concerned with formulating, implementation and reviewing information and data security policies that lay down the procedures in which information and data are handled within e-government systems and transactions. Therefore, these policies constitute the cornerstones of sound and effective cybersecurity needed for building citizens' trust and confidence in e-government services, thus encouraging e-service utilisation (Singh & Karaulia, 2011). Technical procedures are essential to e-government systems to prevent unauthorised access to databases and transactions and these include preventing unauthorised access through the use of encryption, limit access through passwords and securing servers and backbone network infrastructure.

In the context of some developing countries where corruption in government and censorship to personal information are reported (Mistry & Jalal, 2012; Pathak et al., 2008), stringent managerial and technical procedures are essential for building citizens' trust on the security of e-governance systems and for encouraging service utilisation.

3.2.3 Trust

Trust refers to the confidence that citizens have towards e-government systems regarding "freedom from risk of danger or doubt during the e-service process" (Papadomichelaki & Mentzas, 2012:100). Al-Zoubi (2008) suggests that trust is one of the most important catalysts affecting citizens' behavioural intention and decisions to adopt and use e-government systems. The essence of trust as a decisive factor determining the success or failure of e-Government has been reiterated in other studies (Fakhoury & Baker, 2016; Zhao & Zhao, 2010; Shalhoub, 2006). In addition to this, there is a need for government to provide to citizens' ICT ethics and

trust on e-government systems. ICT ethics are mainly concerned with managing the G2C and societal dynamics and relationships associated with the general citizenry and to promote social inclusion so as to guarantee citizens' trust (Al-Zoubi, 2008). Therefore, governments considering rolling out e-government must first identify its stakeholders, understand stakeholders' interests and then devise mechanisms to align and embrace their interests in e-government policy framework. Alharbi et al. (2014), in their study, found a positive significant relationship between citizens' trust in e-government systems and their levels of e-government service utilisation. Moreover, this study posits that to build citizens' trust governments should strive to address transparency, accountability, digital and utilisation divide, cyber trust and social inclusion issues confronted in the SADC region.

3.3 Core Indicators for Assessing ICT

Evaluating ICT for development (ICT4D) under the auspices of the 'information society' has been reiterated at the World Summits on Information Society (WSIS) (ITU, 2014c). In an attempt to assess the information society, the OECD (2009, 2011) developed a conceptual model: ICT supply and demand, ICT infrastructure, electronic content and media, and ICT products. The discussion of ICT and information society core indicators is significant to this study as it contributes to the identification and understanding of key measurement areas for evaluating e-government adoption and utilisation; and more significantly, "shed more light on how e-government adoption strategies should be authored or modified to encourage e-government" (Bwalya, 2011: 111) utilisation in the SADC region. The information society framework (Figure 3-1) advances that ICT products (of which e-government is a part) are offered either through ICT supply-driven or ICT demand-driven strategy (Hafkin, 2009). Whichever strategy governments opt to pursue, will impact the adoption and utilisation of the e-service by users. Normally, governments that pursue ICT supply-driven strategy are concerned with rolling out e-government services to increase access by citizens; without necessarily having consulted citizens regarding services they really need. They hold the belief that once e-services are available, citizens are likely to accept and utilise them. By contrast, in the ICT demand-driven strategy, governments adopt a consultative and democratic stance by gathering views from citizens to arrive at service provision; with the intent to increase the actual service utilisation.

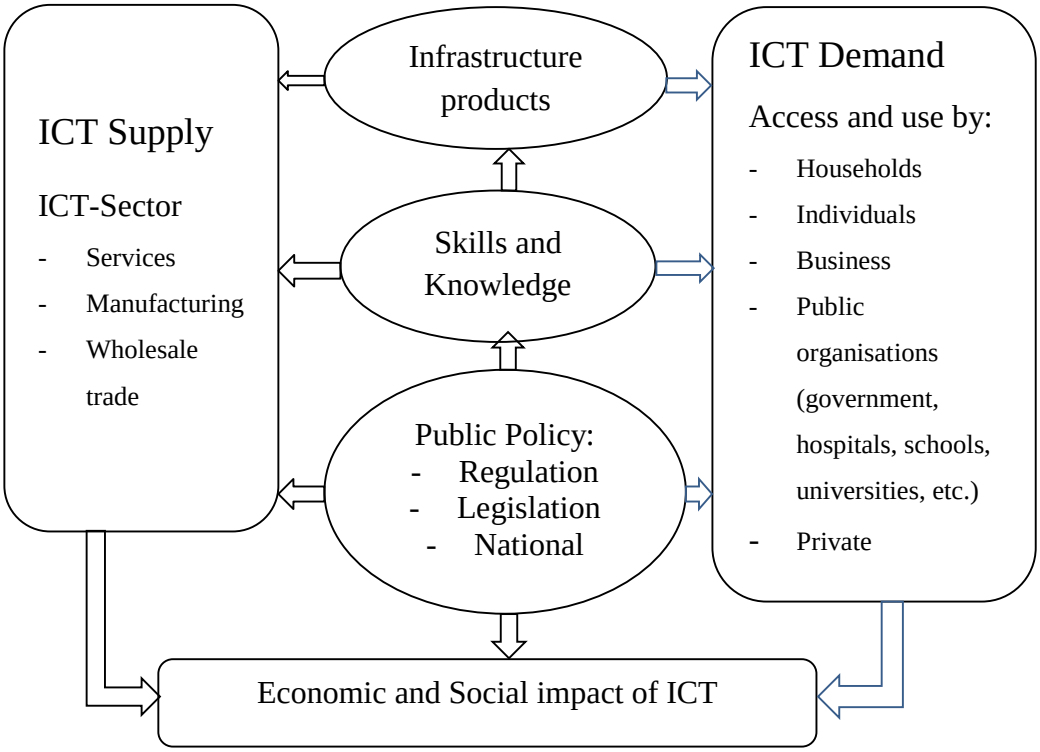


Figure 3- 1: Information Society Conceptual Framework

To achieve the desired social and economic impact of ICT services, the government requires a clear implementation, monitoring and outreach public policy and national ICT strategy (ITU, 2014c). Furthermore, skills and knowledge development amongst government employees go a long way in building confidence in the system, loyalty, and acceptance of e-government systems by citizens. The information society concept is significant in assisting the understanding of key focal areas for governments to direct their attention in e-government adoption and utilisation efforts: strategic planning and evaluation of existing ICT infrastructure (including its coverage, benefits, and shortcomings), the level of penetration, access and use; and levels of inequality in availability.

Advanced by the International Telecommunication Union in 2010, the ICT core indicators are multifaceted pointers aimed at measuring the "access to and use of ICT by individuals, households and organisations" (ITU, 2010: 17). As an assessment tool and benchmarking framework, ICT core indicators reflect the status and trends of ICT adoption and utilisation, thereby guiding policymakers towards effective governance, better service delivery and equitable participation among citizens. Heeks and Santos (2009) suggest that e-government

adoption is to a larger extent influenced by an individual's behavioural intention and the prevailing circumstances. Through understanding the significance of core indicators, governments are able to offer demand-driven ICT services which promote utilisation.

The Expert Group on Telecommunication/ICT Indicators (EGTI) (ITU, 2013b) identified seven major categories of ICT core indicators: ICT infrastructure and access; access to, and use of ICT by households and individuals; use of ICT by business; the ICT (producing) sector; international trade in ICT goods; ICT in education and; and e-government. Noteworthy is the fact that different ICT core indicators are more pertinent to certain domains of e-government interaction than in others.

In view of the Government-to-Citizen (G2C) domain, the focus of this study, only three core indicators are relevant: ICT infrastructure and access; access to, and use of ICT by households and individuals; and e-government.

3.3.1 Core Indicators of ICT Infrastructure and Access

There are ten core indicators under this category related to either infrastructure or access. In terms of ICT infrastructure and access development assessment, a higher value entails an improved situation in terms of ICT infrastructure development; whereas, in tariff-related indicators, a lower value typically indicates a superior state, as displayed in Table 3-1.

Table 3- 1: Core indicators on ICT infrastructure and access

Code	Name of the Core Indicator
A1	Fixed telephone subscriptions per 100 inhabitants
A2	Mobile cellular telephone subscriptions per 100 inhabitants
A3	Fixed (wired)-broadband Internet subscriptions per 100 inhabitants, broken down by speed
A4	Wireless broadband subscriptions per 100 inhabitants
A5	International Internet bandwidth per inhabitant (bits/second/inhabitant)
A6	Percentage of the population covered by at least a 3G mobile network
A7	Fixed broadband Internet prices per month
A8	Mobile cellular telephone prepaid prices per month
A9	Mobile broadband Internet prices per month
A10	TV broadcasting subscriptions

(ITU, 2010, 2014c)

3.3.2 Core Indicators of Individuals' access to, and use of ICTs

There are sixteen core indicators – nine relate to household access to ICT whilst seven correlate to ICT use by individuals. Notably, access to ICT (the availability of ICTs within a household) is essential for the utilisation of ICT. Since the focus of this study is on the G2C domain, core indicators to ICT use by individual citizens are more pertinent as summarised in Table 3-2.

Table 3- 2: Core indicators on access to ICT and their use by individuals

Code	Name of the Core Indicator
HH5	Proportion of individuals using a computer
HH7	Proportion of individuals using the internet
HH8	The proportion of individuals using the Internet, by location: home, work, place of education, another person's home, community internet access facility, commercial internet access facility, in mobility.
HH9	The proportion of individuals using the internet, by type of activity: Getting information about goods or services, seeking health information, internet banking, Sending or receiving e-mail, accessing government services, etc.
HH10	Proportion of individuals using a mobile cellular telephone
HH12	Proportion of individuals using the internet, by frequency: At least once a day At least once a week but not every day, less than once a week
HH15	Individuals with ICT skills, by type of skills: Sending e-mails with attached files, copying or moving a file or folder, etc.

(ITU, 2014c)

Core indicators on access to and use of ICT by individuals are fundamental to this study, focusing on the G2C domain and they have been used to design sections of data gathering instruments (questionnaires and interview questions), crafting research hypotheses and constructing the initial conceptual model.

3.3.3 Core Indicators on e-Government

As policy tools, e-government core indicators assist policymakers in evaluating the position of and developments in e-government systems; and to attain decisive governance, offer better services and equitable participation of citizens in government-related affairs. Partnership on Measuring ICT for Development (2012) identifies seven core indicators pertinent to assessing e-government progress as displayed in Table 3-3.

Table 3- 3: Core indicators on e-Government

Code	Name of the Core Indicator
EG1	Proportion of persons employed in central government organisations routinely using computers
EG2	Proportion of persons employed in central government organisations routinely using the Internet
EG3	Proportion of central government organisations with a local area network (LAN)
EG4	Proportion of central government organisations with an intranet
EG5	Proportion of central government organisations with internet access, by type of access: Narrowband, fixed (wired) broadband, Wireless broadband
EG6	Proportion of central government organisations with a web presence
EG7	Selected internet-based services available to citizens, by level of sophistication of service

(ITU, 2014c)

This study investigates the relevance of the 'ICT core indicators' on evaluating e-government adoption and utilisation in the G2C context in Africa, similar to studies conducted by (Majdalawi et al., 2015; Afacan & Arifoğlu, 2015) in Jordan and Turkey respectively. Therefore, this study seeks to investigate how core indicators can be incorporated into framing up a novel e-government adoption and utilisation conceptual model in the G2C context. Having drawn upon diverse factors affecting citizens' decisions to adopt and utilise e-government and core indicators used to measure access to and use of ICTs by individuals, various researchers have developed different models and frameworks to predict and measure ICT adoption and utilisation trajectories by people in different setups.

Visser and Twinomurinzi (2009) argue that e-government is part of ICTs and that the predominant vehicle for offering e-government is ICTs. These models and frameworks are pertinent in studying e-government adoption and utilisation. After outlining the relationship between the core indicators and personal factors affecting e-government adoption and utilisation, the next section discusses various e-government adoption and utilisation models relevant to this study.

3.4 Theories of Adoption pertinent to e-Government

In the pursuit to understand models and theories underpinning e-government phenomena, it is essential to understand three key terms often wrongly used interchangeably: e-government adoption, e-government acceptance, and e-government utilisation. Gilbert, Balestrin and Littleboy (2004: 287) define e-government adoption as "the individual's decision on whether or not to use the technology based on perceptions of the technology, for example, the relative advantages, compatibility, flexibility, usefulness, ease of use, perceived risk, trustworthiness, external influences, internet safety, interpersonal influences and facilitating conditions." Similarly, Khanh, Trong, and Gim (2014) describe adoption as the motive by citizens to participate in accessing, requesting and receiving information and services using e-government systems. From these two definitions, convenience, accessibility, willingness and intention to use e-government emerge out as central to adoption. Furthermore, Gilbert et al.'s (2004) definition show that e-government is a multidimensional concept which calls for a holistic approach that embodies social, cultural, developmental and political aspects to attain its goals. According to the Partnership on Measuring ICT for Development (2011: 17), ICT acceptance refers to the "interaction between a user and a system or ICT". Weerakkody (2012) also identifies ICT acceptance as the citizen's psychosomatic readiness to embrace technology and e-services for their intended use. From these definitions, it is worth noting that acceptance of e-government "will not necessarily end in adoption and vice versa adoption does not allow for concluding on acceptance" of e-government, (Hofmann, Räckers, & Becker, 2012:3). Furthermore, the acceptance and possession of an ICT device with internet capabilities and access to e-government by an individual does not necessarily lead to that person using e-government services – there are many factors influencing one's final decision to use e-government systems as indicated in the first section of this chapter.

In that regard, these two definitions of ICT acceptance are pertinent to in clarifying that ownership of an ICT device with access to the internet does not always lead to e-government adoption. The United Nations e-Government Survey (2014) state that accesses to ICTs and e-government are a prerequisite for utilisation. Thus, utilisation of e-government refers to the actual consumption (continual usage) of an e-service by citizens (Carter & Bélanger, 2005).

Drawing upon information systems literature, many models and theories have been advanced to assess citizens' behavioural intention to accept, reject and use technological innovations or remain neutral. Clear understanding of and reference to e-government adoption, acceptance and utilisation models aid policy-makers in authoring interventions to stimulate uptake of supply-driven e-government initiatives and drafting of novel e-government strategies inclined towards demand-driven e-services that stimulates acceptance and utilisation by citizens (Bwalya & Healy, 2010; Lin, Fofanah & Liang, 2011; Lee, Kim & Ahn, 2011).

Moreover, analysis of technology adoption models is significant in aiding the identification of an understanding of additional factors influencing the adoption and utilisation of e-government systems by citizens in the SADC region. Policy makers and government agencies should know why citizens behave in certain ways in the face of new e-government initiatives and as such, scholars' efforts to understand different technology adoption models are discussed in the next section.

3.4.1 ITU e-Government Implementation Toolkit

The e-Government Implementation Toolkit Framework was advanced by the International Telecommunications Union (2009) as a decision making and implementation tool. The framework identifies four key dimensions of the e-government environment, namely infrastructure, policy, governance and outreach. These four modules assist decision makers to identify priority areas requiring attention, based on a nation's level of readiness and development strategies (ITU, 2009). The ITU framework suggests that e-government readiness of the local context of project implementation is essential for the successful adoption and utilisation of e-government systems. Moreover, Matavire et al., (2010) report that e-government strategies in most developing countries are adopted without adequate consideration of the local context in which the solutions are implemented.

In line with this suggestion, the ITU framework acknowledges the significance for developing nations to conduct a swot analysis in their national e-government readiness assessment when considering adoption of any e-government solutions. Successful e-government adoption and utilisation depend on the political will of all concerned stakeholders and the willingness by government departments to undergo process re-engineering of both front and back office

operations (ITU, 2009). The four constructs of the ITU framework has been used as a theoretical lens in several previous studies (Ashaye, 2014; Mohammed & Ibrahim, 2013; Abdalla, 2012) to investigate the e-government readiness of developing nations in adopting e-government systems. The four core e-government readiness assessment dimensions identified in this toolkit pertinent to this study are:

1. **Infrastructure Dimension -** ICT infrastructure forms the backbone through which e-government systems are offered. Therefore, it implies that if informed and accurate assessments of e-government readiness and access levels to e-government services for any given country are to be made, the status quo of ICT technical infrastructure should be thoroughly examined. Over and above this, empirical evidence in-line with governments' efforts in attaining interoperability with the rapidly spreading mobile networks and services must also be pursued (Hafkin, 2009).

2. **Policy Dimension -** according to the ITU (2009:6), a policy "is a deliberate plan of action to guide decisions and achieve rational outcomes." The e-government operational environment is shaped and regulated by many diverse policies: policies on standardisation of protocols, competition and antitrust approaches, and policies on strategically enhancing the provision of universal internet services and price regulation for consumers. Policies targeted at guarding important ICT infrastructure equally shape-up the e-government domain (ITU, 2009:6) and as such, the policy dimension is core to any e-government adoption and utilisation efforts.

3. **Governance Dimension -** holds that political authorities and institutional resources are managed and utilised equitably for the benefit and alleviation of a society's problems. Therefore, access to and sharing of information, and transparency in government operations should become the norm of any democratic state (Lubua & Maharaj, 2013). Moreover, Lubua and Maharaj (2013), recommend the adoption and utilisation of e-transparency tools such emails, video conferencing, social websites and e-government systems as the best strategy for delivering public services, sharing information and stamping good governance - that is to say, no abuse of government power, facilitating freedom of speech to citizens and curbing of corruption. Good governance climate with "genuine commitment and willingness of governments to induce transformational patterns towards being more citizen-centred," (Hafkin, 2009:2) goes a long way in

building citizens' trust on government and encourages the adoption and utilisation of e-government systems.

4. **Outreach Dimension -** holds that public e-systems and information are horizontally integrated, that is, disseminated to all concerned users. This includes government to citizens (G2C), government to business (G2B), and government to government (G2G). Outreach entails that governments should not only endeavour to supply comprehensive one-stop e-government services, but also embark on an awareness campaign to all stakeholders on the availability and benefits of using e-systems. Resources permitting, e-government training to citizens on how to access and effectively use e-government systems should be vigorously pursued. Also essential are outreach efforts targeted at gathering citizens' views and input on e-government before project implementation in order to increase acceptance.

The ITU Toolkit framework is pertinent to this study as it provides guidelines for evaluating the e-government implementation environment; benchmarking with other countries with similar economies, and identifying priority areas for further action (ITU, 2009). From a theoretical viewpoint, the ITU framework provides major constructs and factors associated with government-initiated e-government projects (supply-driven), which affect citizens' decisions to adopt and utilise such e-services.

The analysis and review of the ITU e-Government Implementation Toolkit in light of its previous application in the broader field of ICT innovation, implementation and adoption are essential for discovering its applicability to discover areas requiring more attention for research. In-line with this assertion, AlKhatib (2013:64) posits that:

> "A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed."

Moreover, Webster and Watson (2002) argue that a thorough analysis of a model should synthesise prior applications in contemporary studies without geographical or research methodology confinements. Previous studies (Alghamdi, Goodwin & Rampersad, 2011; Abdalla, 2012; Yoon & Chae, 2009; Mishra & Mishra, 2011) on ICT adoption and utilisation in the context of developing nations revealed the need for more studies to investigate e-

government adoption and utilisation using the ITU e-Government Implementation Toolkit. Thus, this warrants its further investigation regarding its suitability in the context of e-government adoption and utilisation in the SADC region.

3.4.2 Innovation Diffusion Theory (IDT)

The Innovation Diffusion Theory was advanced by Rogers (1962; 1983) and describes how new technology is adopted by people (Kumar et al., 2007; Rokhman, 2011; Lee, Hsieh & Hsu, 2011; Podder, 2013). In an effort to clarify e-government phenomena, Rogers (1962) clarified the difference between innovation diffusion and innovation adoption. Innovation diffusion process transpires within a societal or group setup; whereas innovation adoption relates more to individual citizens.

The IDT is essential to this study as it seeks to answer questions pertinent to e-government adoption and utilisation, such as: why certain ICT innovations spread quickly, whilst others fail? Why specific ICT innovations are prone to be adopted and utilised, whilst others get rejected? Unlike other technology acceptance theories, the IDT focuses more on "whether the innovation itself fits well into individual needs" of citizens and "what determines the rate of the speed adoption of such innovation" as opposed to analysing individual actions of citizens towards technology innovation (AlKhatib, 2013:44). Moreover, the IDT identifies five major innovation qualities as core determinants to predict individual citizens' decisions on whether to use or reject technology: relative advantage, complexity, compatibility, trialability, and observability – see Figure 3-2. Each of these constructs; argues Rogers (1983) offer some relative advantage to and motivate individuals to accept and use new technology. The quicker and stress-free one attains the results from using a technology innovation, the more likely they are to adopt it, encourage others to use it and indeed, continue utilising it for meeting their service needs (Rogers, 1995).

The IDT has inspired many studies investigating the trends and rate of e-government adoption and utilisation in different regions across the world (Zafiropoulos, Karavalisis & Vrana, 2012; Khanh et al., 2014; Bwalya & Mutula, 2014; Chan et al., 2010; Zhang, Xu & Xiao, 2014). Not only has the IDT found its use in explaining diffusion and adoption in the narrow area of e-government; but also in the broader context of Information and Communication Technologies

for Development (ICT4D): e-Learning, e-Health, e-Business, e-Culture and e-Media (Hilbert, 2012).

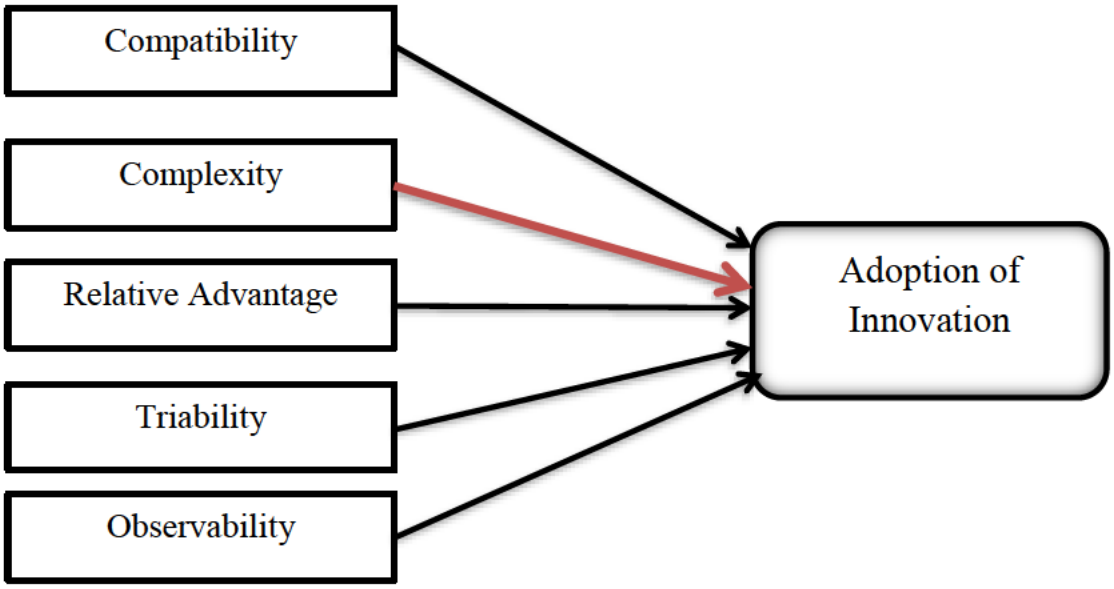


Figure 3- 2: Innovation Diffusion Theory, (adapted from: Rogers, 2003)

In essence, researchers have opted to expand the scope of the IDT by investigating the effect of personal factors on the adoption and utilisation of various technological innovations, notably; gender (Pankan & Radhakrishnan, 2016; Ilie, Van-Slyke, Green & Lou, 2005); levels of education (Sahin, 2006) and socio-culture influence (Alsaif, 2013; Olaitan, 2015; Ziemba, Papaj & Żelazny, 2013). Despite having enjoyed extensive usage and inspiring countless studies concentrated on technology adoption and innovation, the IDT has attracted some critiques regarding its completeness and effectiveness (Khanh et al., 2014; Rana, Dwivedi & Williams, 2013; Bwalya, 2011; MacVaugh & Schiavone, 2010; Lee, Lee & Yang, 2014). Having been inspired by the IDT, Fishbein & Ajzen (1975) advances the Theory of Reasoned Action (TRA), are outlined in the next section.

3.4.3 Theory of Reasoned Action (TRA)

Advanced by Fishbein and Ajzen (1975), TRA posits that a person's beliefs lead to attitudes; which in turn lead to behavioural intentions and finally to the behaviour itself. The theory argues that the behaviour of an individual towards accepting and using new technology is influenced by a combination of numerous factors that are difficult to predict and measure.

These include subjective norms which are also referred to as social pressure, beliefs and attitudes. Collectively, these factors add up to model an individual's general behavioural intention and actual behaviour towards acceptance of new technology. The fundamental assumption behind TRA is that individuals are sensible-actors who calculate the "consequences of their actions before they actually engage in behaviour" (Boone, 2012:11).

Figure 3-3 illustrates the TRA – an individual's actual behaviour (that is to say, acceptance or rejection of a particular technology innovation) is governed by one's behavioural intention to act in such a way. In essence, that behavioural intention is jointly affected by both one's subjective norms and attitudes. Despite its relevance to predicting individuals' behaviour in the face of technology innovations, TRA is less strongly linked to evaluating technology adoption.

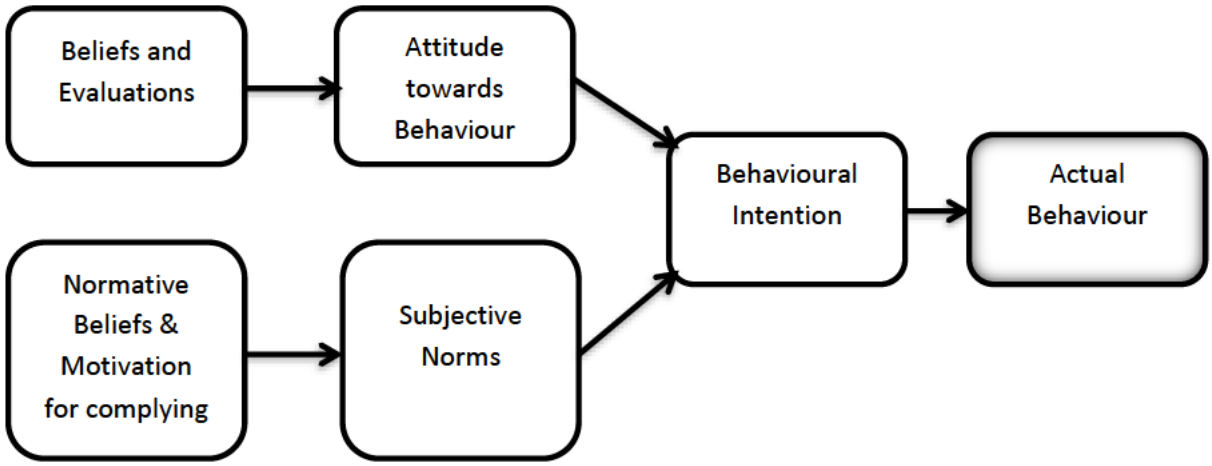


Figure 3- 3: Theory of Reasoned Action Model, (Fishbein & Ajzen, 1975)

Having realised the pitfalls of the TRA, Fishbein and Ajzen (1988, 1991) advanced the Theory of Planned Behaviour (TPB) which holds that when technology is introduced for the first time, an individual's voluntary behaviour to use such technology is not 100%. In this regard, the TPB incorporated 'perceived behavioural controls' into the original TRA models. The TPB has enjoyed wide application in many fields: life sciences (Zagata, 2012); computers (Lee, Cerreto & Lee, 2010); information systems (Southey, 2011); medical sciences (Javadi et al., 2013). The next section discusses the development and use of the Technology Acceptance Model (TAM), (Davis, 1986, 1989).

3.4.4 Technology Acceptance Model (TAM)

The Technology Acceptance Model was inspired by the Theory of Reasoned Action and focuses more on technology acceptance. Unlike the previous theories, TAM focuses on two major aspects; psychological dispositions and social influences (Boone, 2012). By elaborating the integral part played by psychological factors in the process of technology adoption, TAM has advanced beyond demographic factors; and in that regard, become a much comprehensive model in predicting and explaining the behaviour of end-users towards system utilisation (Al-adaileh, 2009; AlKhatib, 2013). According to Davis (1986), perceived usefulness (PU) and perceived ease of use (PEoU) are the two major psychological variables of the TAM. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance," (Davis, 1989:320). Whereas; PEoU is "the degree to which a person believes that using a particular system would be free from effort"; (Davis, 1989:320; Khayati & Zouaoui, 2013; Abu-Shanab, 2014; Cho & Sagynov, 2015).

PU is regarded as an essential determinant affecting an individual's decision to engage with and utilises a specific technology innovation (Venkatesh & Davis, 1996; Park, Nam & Cha, 2012; Persico, Manca & Pozzi, 2014). Moreover, Rabaa'i (2015) posits that if an individual has higher PU for a specific e-government service; he/she is bound to adopt and utilise such services. More significantly, the TAM model recognises causal relationships existing amongst the major variables: system design features, PU, PEoU, one's viewpoint towards using technology, and actual e-service utilisation (Davis, 1989). Consistent with the TAM, the easier someone feels it is to use a system (PEoU), the more one is likely to use and continue using the same system – thus directly influencing PU. Figure 3-4 illustrates the major components of the TAM which determine one's behavioural intention to utilise a system.

The TAM has been widely used in various fields of research to assess users' acceptance of new innovations: in ICT to assess acceptance of smart devices by university students (Abu-Al-Aish, Love & Hunaiti, 2012; Jairak, Praneetpolgrang & Mekhabunchakij, 2009; Park et al., 2012); e-Government and m-Government (Suki & Ramayah, 2010; Lim & Ting, 2012; Abu-Tair & Abu-Shanab, 2014); e-Commerce and online consumer behaviour (Hajli, 2013; Wang & Chou, 2015); social media (Agnihotri, Kothandaraman, Kashyap & Singh, 2012; Naylor, Lamberton & West, 2012).

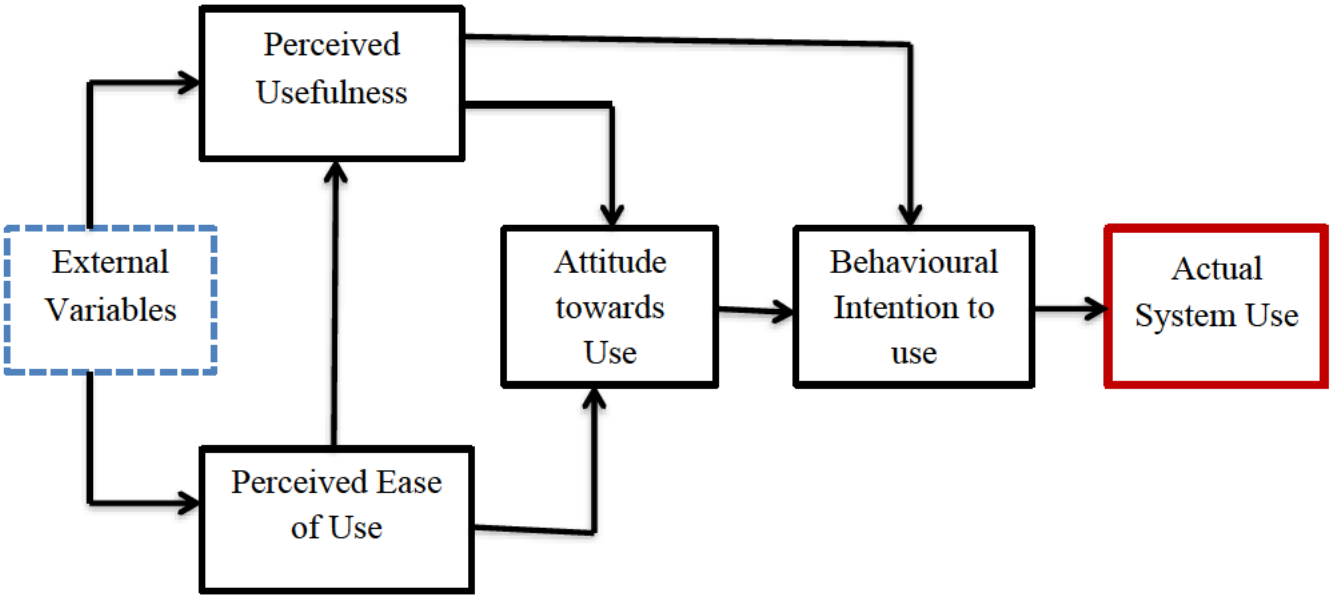


Figure 3- 4: Technology Acceptance Model, (Ajzen, 1991)

According to Alsaif (2013), the use of the two constructs of perceived ease of use and perceived usefulness in assessing 'use acceptance' of technological innovation in various circumstances differ subject to local and cultural context. In line with this subjectivity, Bwalya (2012: 115) found that the prediction accuracy of TAM is very significant, (45% - 70%) in western countries as compared to "10% - 35%" accuracy levels for Africa and Asian countries.

Since its inception, the TAM went through some transformation to enhance its efficiency in evaluating the uptake of new technology. Venkatesh, Speier, and Davis (2002) have advanced TAM by proposing one of the most influential Extended Technology Acceptance Model (TAM2) that take into account the local context of the application of the ICT innovation. Figure 3-5 shows TAM2. More significantly, TAM2 posits that in assessing factors influencing an individual's decisions to adopt or reject an ICT innovation, three inter-related social factors should be considered; voluntariness, subjective norms, and image. The other added constructs into the TAM2 include job-relevance, result-demonstrability, output quality, and experience. The TAM2 opened up avenues for the designing of many customised adoption models that

attempt to address the local context where technology innovations are announced (Lee et al., 2010a).

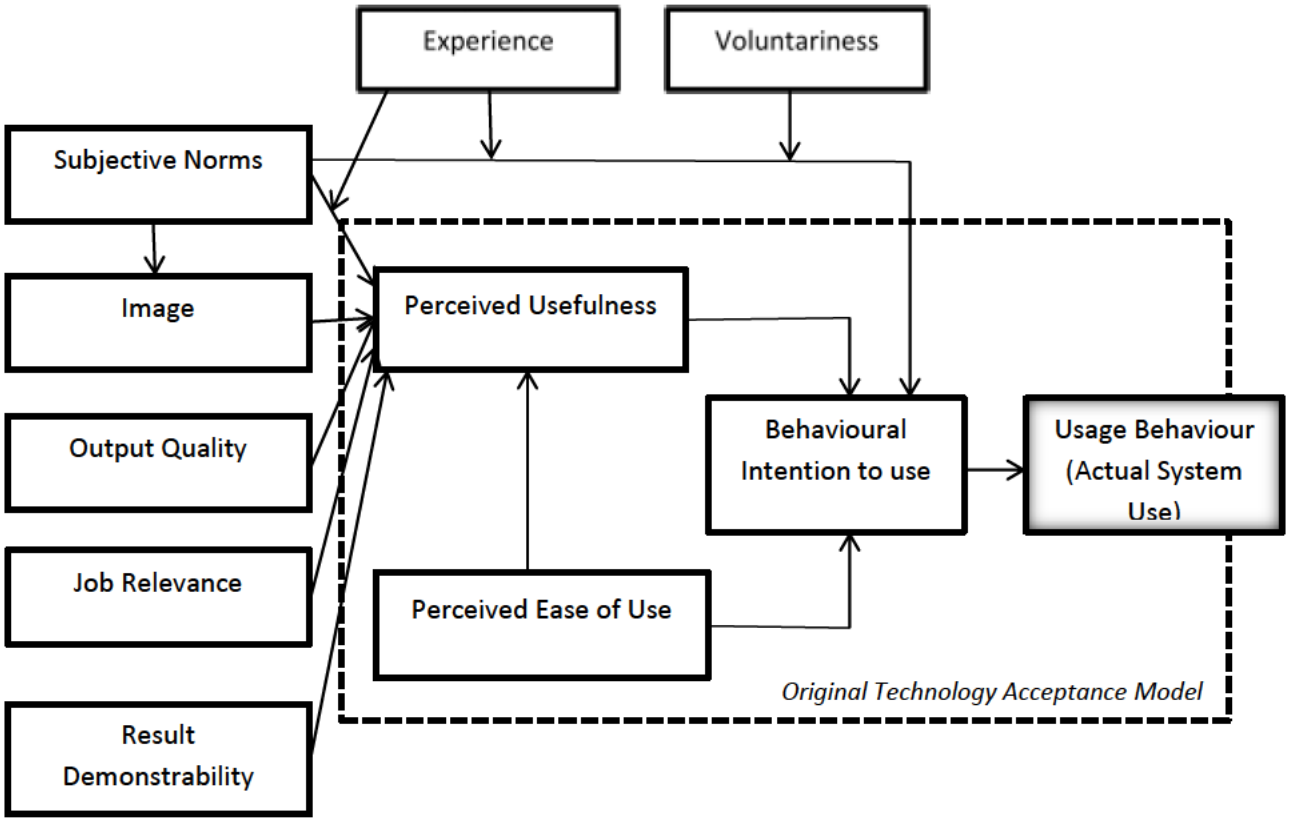


Figure 3- 5: Extended TAM2, (Venkatesh et al., 2002)

With inspiration from TAM, TAM2, and other previous technology adoption models, Venkatesh et al. (2003) advanced the unified theory of adoption and use of technology (UTAUT), as discussed next.

3.4.5 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) Model was advanced by Venkatesh et al., (2003) as a benchmark model for assessing technology adoption (Al-Sobhi, Weerakkody & El-Haddadeh, 2011). The UTAUT model explains the user's intention to engage with an information system and the actual use behaviour. The UTAUT model is an integration of eight different models that seeks to explain user acceptance behaviour: the theory

of reasoned action (TRA) (Fishbein & Ajzen, 1975); the technology acceptance model (TAM) (Davis, 1989; Davis et al., 1989); the motivational model (MM) (Davis et al., 1992); the theory of planned behaviour (TPB) (Ajzen, 1991); Combined TAM-TPB (C-TAM-TPB) (Taylor and Todd, 1995); the model of PC utilisation (MPCU) (Thompson, et al, 1991); the innovation diffusion theory (IDT) (Rogers, 1995), and the social cognitive theory (SCT) (Bandura, 1986; Compeau & Higgins, 1995). According to Venkatesh et al., (2003), the UTAUT model explains 70% of technology acceptance behaviour of technology users as compared to only 40% by previous models. After receiving some critique from other scholars (Sundaravej, 2009; Al-Qeisi et al., 2015; Al-Mamary et al., 2016) regarding the suitability of the UTAUT model in evaluating acceptance and use of new technology in the 'consumer use context', Venkatesh, Thong and Xu (2012) came up with the UTAUT2 model. Figure 3-6 illustrates how the UTAUT models evolve from the major eight technology acceptance models to the UTAUT2 model explained below.

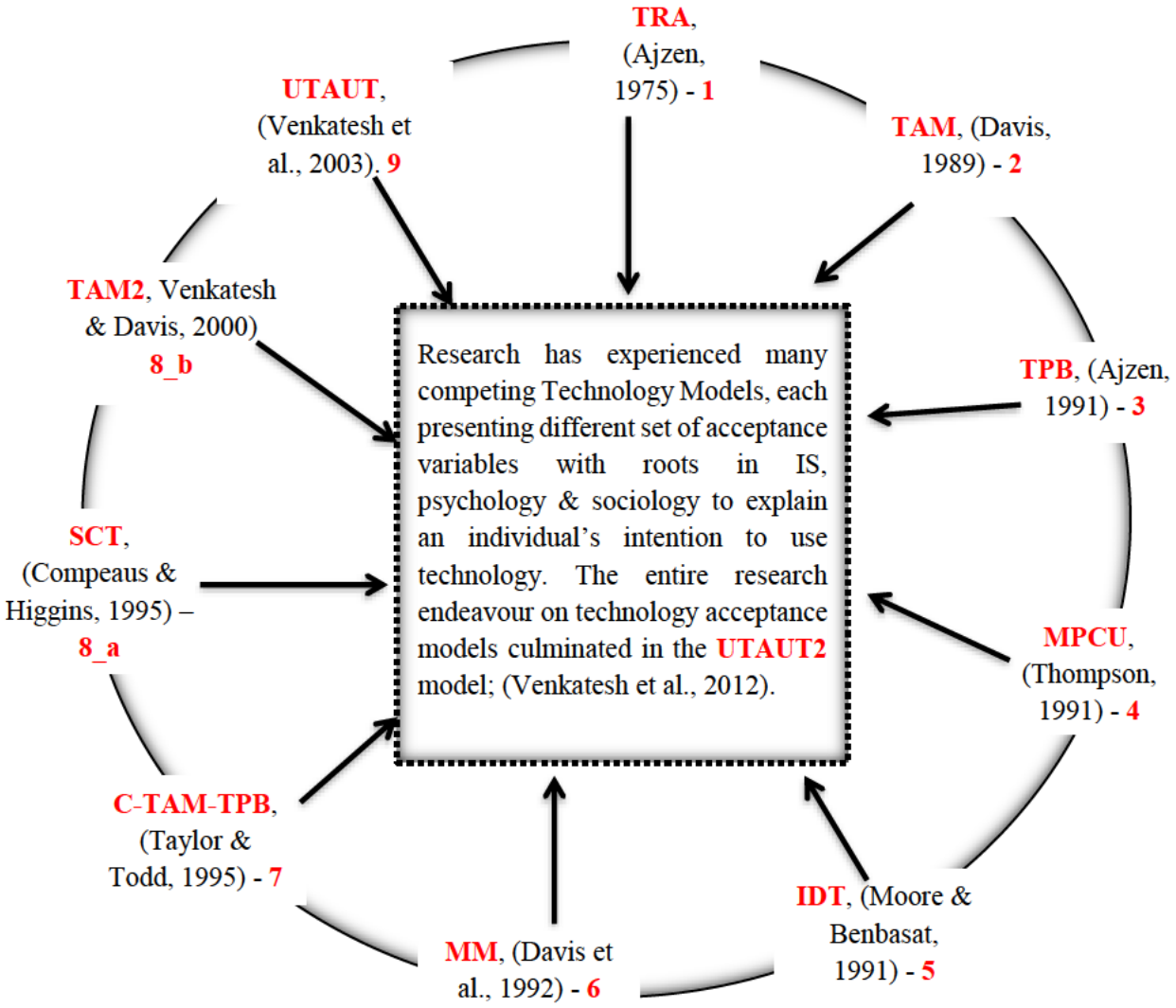


Figure 3- 6: Evolution of the UTAUT2 Model, (AlKhatib, 2013)

The UTAUT model (Figure 3-7) identifies five core direct determinants of behavioural intention and use behaviour of e-government services by citizens, alongside four key moderating factors (gender, age, experience and voluntariness of use) and these have a direct effect on five determinants, which are:

1. **Performance Expectancy (PE)** - this pertains to an individual's belief that the use of a particular system will benefit him/her to accomplish his/her job performance targets, (Venkatesh et al., 2003). Such benefits could be gains in terms of money, time, and effort used and equal opportunities for citizens to access government services.
2. **Effort Expectancy (EE)** - this refers to "the degree of ease associated with the use of the system" (Venkatesh et al., 2003: 450).

   The learning curve for mastering a new system has an effect on the actual utilisation of e-government services (AlAwadhi & Morris, 2008).
3. **Social Influence (SI)** - this relates to the extent to which one perceives that other citizens expect him/her to adopt and use a new system, (Venkatesh et al., 2003: 451).
4. **Facilitating Conditions (FC)** - pertains to an individual's beliefs that organisational and technical infrastructure is in place to support the use of new systems, (Venkatesh et al., 2003: 453).
5. **Behavioural Intention (BI)** - indicates one's intention (subjective probability) and decision to use a specific system, (Davis et al., 1989).

The four moderating variables of the UTAUT model are age, gender; experience and voluntariness of use. These have a direct effect on the five determinants and have been explained in detail in the previous sections of this chapter. Therefore, the UTAUT model posits the following association effects: (a) age and gender variables moderate the association of PE and BI to use a specific e-government system; (b) age, gender and internet use experience variables moderate EE and BI; (c) age, gender, internet use experience and voluntariness to use a new system variables moderate the relationship between SI and BI; and (d) age and internet use experience moderate the association between FC and BI. These associations have a significant effect on establishing individuals' behaviour and reaction towards newly introduced technology innovation and this has a direct bearing on their acceptance and actual service utilisation. Figure 3-7 illustrates the constructs of the UTAUT Model.

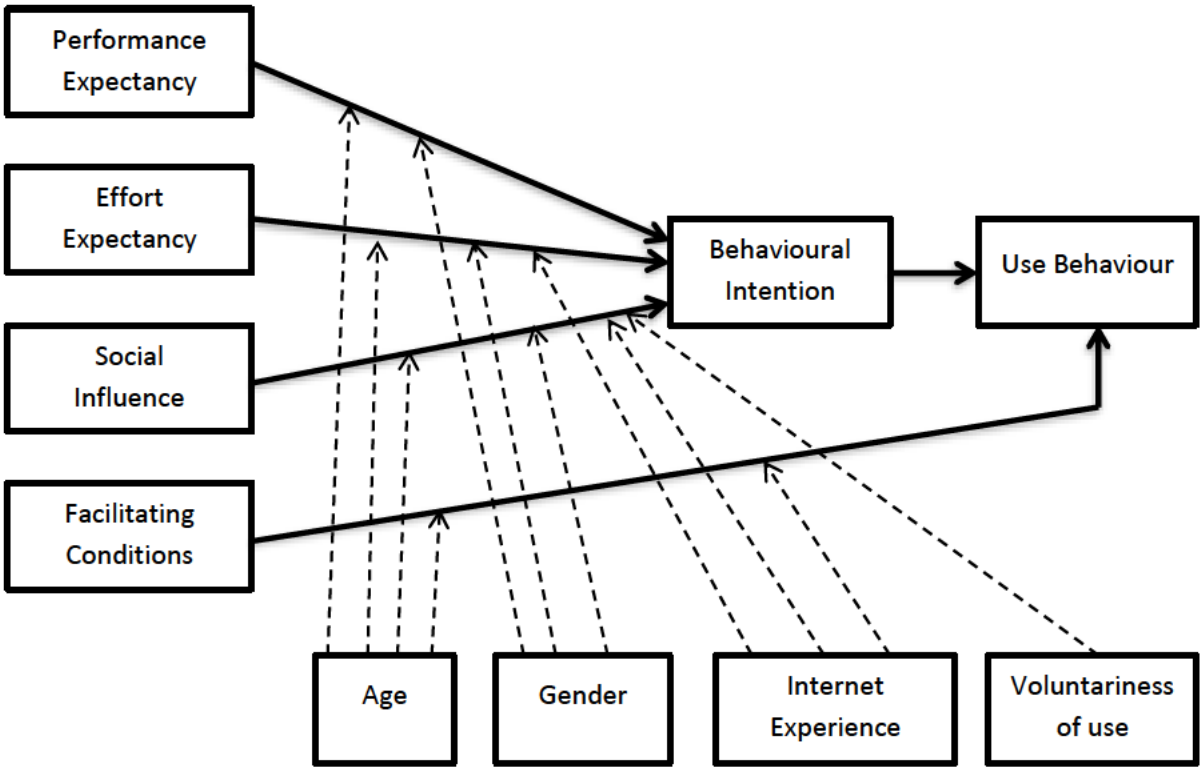


Figure 3- 7: UTAUT Model, (Venkatesh, et al., 2003)

3.4.6 Extended Unified Theory of Acceptance and Use of Technology (UTAUT2)

Venkatesh, Thong and Xu (2012) extended the original UTAUT model to UTAUT2 to suite consumer-use acceptance context by eliminating the individual variable of voluntariness and incorporating three new constructs of hedonic motivation, price value, and habit. See Figure 3-8. The UTAUT model was designed to evaluate users' behavioural intention to accept and use technology predominantly in an organisational context. Venkatesh et al., (2012) found justification to extend it to cover the consumer technology adoption context – and citizens in the G2C setup are part of technology consumers. Furthermore, Venkatesh et al., (2012) observe that most researchers who tried to extend the original UTAUT model through the addition of new constructs have ignored the theoretical context of the application and theoretical complementarity of existing constructs; and in the process have missed out on the generalisability requirement for theoretical frameworks. Against this background, the next section explains the three added constructs of hedonic motivation, price value, experience and habit:

1. **Hedonic Motivation** – defines the pleasure that comes with the utilisation of a particular technology innovation and this plays a greater role in defining the acceptance and actual utilisation (Brown & Venkatesh, 2005). Researchers in IS related studies argue that hedonic motivation (synonymous to derived enjoyment) was found to have a direct influence on consumers' acceptance and use of new technology (Ain, Kaur & Waheed, 2015; Sun & Bhattacherjee, 2014; Yang & Forney, 2013; Raman & Don, 2013; Abad, Diaz & Vigo, 2010). Therefore, the significance of hedonic motivation in evaluating the acceptance and utilisation of e-government in the context of the SADC region is worth establishing in this study.
2. **Price Factor (Value)** – Venkatesh et al., (2012) indicate that the UTAUT model was developed to evaluate technology use in the organisational setup; whereas the UTAUT2 targets the consumer-user settings. Given this background; the cost and price structures of accessing e-government services in the consumer user-setup are directly carried by the consumer and this has an impact on service utilisation. For instance, it is clear in numerous studies that the popularity of WhatsApp (Church & de Oliveira, 2013; Yeboah & Ewur, 2014) across the world and short messaging services (SMS) in China (Chan et al., 2008); in India (Thomas, 2012) and world-over (Dettling & Hitz, 2016) is attributed to low cost of WhatsApp and SMS comparative to other kinds of Mobile-Internet applications. In the private sector, the price value of a service or commodity is often associated with quality of the artefact or service (Venkatesh et al., 2012). In contrast, in the public sector, the objective is on offering non-discriminating, allowable and efficient services to all citizens and this has a strong bearing on e-government utility.
3. **Experience and Habit** – prior experience in using a specific technology and personal habits of an individual plays a significant role in determining one's acceptance and utilisation decisions of e-government. Kim and Malhotra (2005) see experience as the passage of time from the time one first used a system to date and is usually measured in months or years. In contrast, habit is the propensity of an individual to spontaneously perform certain behaviour after learning something (Limayem et al., 2007). In the study of e-government adoption and utilisation by citizens, both concepts are essential as they have a direct influence on one's future behavioural intention to use or reject an e-government service. Empirical findings regarding the effect of experience and habit among citizens of different age groups and gender revealed that there is a strong co-relationship between one's prior experience, age, and e-government utilisation; habit,

gender and e-government acceptance and utilisation (Venkatesh et al., 2012; Morgeson III et al., 2011; Kumar et al., 2007).

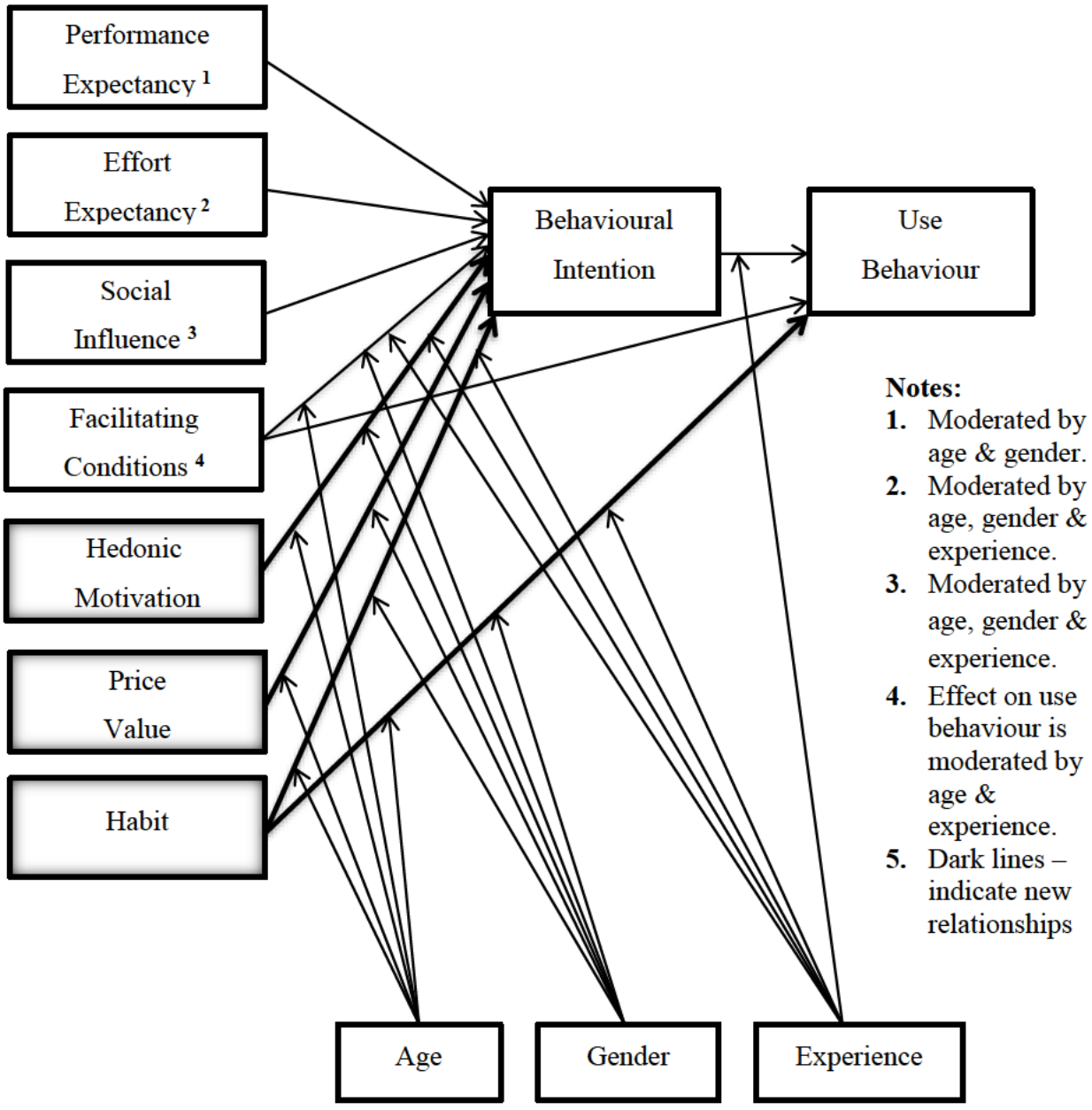


Figure 3- 8: Extended UTAUT2 Model, (Venkatesh, et al., 2012)

After discussion of various e-government adoption and utilisation models above, the next section critiques the models and their suitability in the context of developing countries to establish the knowledge gap.

3.5 Critique of the current e-Gov Adoption and Utilisation Models

Most models of e-Gov adoption, acceptance, and utilisation in the G2C domain tend to focus on the adoption and acceptance; paying less attention to citizens' utilisation levels, satisfaction, and loyalty. The United Nations e-Government Survey (2014) states that the guiding question for governments when making e-government policies is on how to make people utilise e-government and derive benefits? Whilst the UTAUT model is regarded by many scholars as a comprehensive model amalgamating other eight previous models focusing on the psychological, sociological and communications aspects of ICT; Venkatesh et al., (2012: 158) acknowledges that "there is still the need for a systematic investigation and theorising of the salient factors that would apply to a consumer technology use context." Furthermore, the UTAUT model was originally intended to evaluate technology acceptance and use by employees in the working environment context, characterised by extensive supporting mechanisms like training, funding, and workshops to ensure obligatory usage and task performance. Contrary to this backdrop, Venkatesh et al., (2012) advanced the UTAUT2 to counter detractors and proponents (Bagozzi, 2007; Benbasat & Barki 2007; Venkatesh et al., 2007; Voutinioti, 2013) of technology acceptance models by catering for the consumer context of e-government through inco-operation of three new constructs: hedonic motivation, price value, experience and habit.

Drawing upon literature on e-government adoption and utilisation; the following shortfalls are identified and should inform the people-driven model to be proposed by this study. Excessive focus on behavioural and psychological aspects of users at the expense of other crucial external factors related to e-government portals such as quality of services, security, and trust. In addition, most previous models ignored catalyst factors from the demand-side (citizen) of e-government, such as inclusiveness and multichannel access that should inform government decisions concerning e-service implementation (Al Shibly & Tadros, 2010). Analogous with Benbasat and Barki (2007), the author has observed that UTAUT models, though fundamental in assessing the adoption and acceptance of IS, has taken away researchers' attention regarding 'exhaustive' understanding of e-government adoption and utilisation in a unified manner, considering its integration with both supply-driven and demand-driven initiatives.

Additionally, one of the widely cited limitations of numerous studies on validating e-government adoption and utilisation is excessive reliance on homogenous groups like students

or government employees; thus inviting generalisation complication of the study (Fischer, 2014; AlKhatib, 2013; Eisenhardt, 1989). Studies on G2C adoption and utilisation should preferably cut across the entire population; and if resources permit, cover a region (Alshehri, Drew & Alfarra, 2012; Al Khatib, 2013).

Further scrutiny of the so-called comprehensive UTAUT2 model revealed some inadequacies in going beyond behavioural intention and use behaviour. It is unclear what happens after these two behavioural features have been informed by the direct determinants and moderators. In this regard, the model should be extended to include:

- Constructs after use behaviour of 'acceptance and utilisation'; followed by 'citizen satisfaction and loyalty'.
- Pertinent determinants to the G2C domain; namely, privacy, security, and trust; quality of service and e-Government awareness.
- Essential moderators to direct determinants are missing and these include education level of users and user's experience in using computers, smartphones and other PDA, the internet, and e-government.

3.6 Hypotheses Development

According to Creswell (2014), hypothesis statements are tentative, formal predictions and explanations held by the researcher on the possible outcome of a research inquiry; prior to data collection. Hypotheses statements are essential in quantitative research and in mixed methods approach for establishing the significance of relationships between investigated variables. Using suitable and standard mathematical models the hypotheses will be tested and the results reported in Chapter six. In investigating the adoption and utilisation of e-government in Zambia and Zimbabwe, the ensuing hypotheses were established:

H1 (a0): *Level of education does not influence behavioural intention to adopt e-government systems.*

H1 (a1): *Level of education influences behavioural intention to adopt e-government systems.*

H1 (b0): *Level of education does not influence use behaviour in an e-government systems.*

H1 (b1): *Level of education influences use behaviour in an e-government systems.*

H1 (c0): *Experience of using the internet does not influence use behaviour of e-government systems.*

H1 (c1): *Experience of using ICTs influences use behaviour of e-government systems.*

H1 (d0): *Availability of vernacular language option does not influence behavioural intention to adoption e-government systems.*

H1 (d1): *Availability of vernacular language option influences behavioural intention to adoption e-government systems.*

H2 (a0): *Awareness of e-government does not influence behavioural intention to adopt e-government systems.*

H2 (a1): *Awareness of e-government influences behavioural intention to adopt e-government systems.*

H2 (b0): *Awareness of e-government does not influence use behaviour of e-government systems.*

H2 (b1): *Awareness of e-government influences use behaviour of e-government systems.*

H3 (a0): *Effort Expectancy does not influence use behaviour of e-government systems.*

H3 (a1): *Effort Expectancy influences use behaviour of e-government systems.*

H4: *Performance Expectancy positively influences citizen's use behaviour of e-government systems.*

H5 (a): *Social influence and habits positively influence citizen's behavioural intention to adopt e-government systems.*

H5 (b0): *Social influence and habits do not influence use behaviour of e-government system.*

H5 (b1): *Social influence and habits influences use behaviour of e-government systems.*

H6 (a0): *Citizens' behavioural intention to adopt e-government systems does not influence use behaviour of such systems.*

H6 (a1): *Citizens' behavioural intention to adopt e-government systems influences use the behaviour of such systems.*

H7 (a0): *Price value associated with internet access does not influence citizens' behavioural intention to adopt e-government systems.*

H7 (a1): *Price value associated with internet access influences citizens' behavioural intention to adopt e-government systems.*

H8 (a0): *Citizens' perceived privacy, security and trust do not influence their behavioural intention to adopt e-government systems.*

H8 (a1): *Citizens' perceived privacy, security and trust influence their behavioural intention to adopt e-government systems.*

H8 (b0): *Privacy, security and trust do not influence citizens' use behaviour of e-government systems.*

H8 (b1): *Privacy, security and trust influences citizens' use behaviour of e-government systems.*

H9 (a0): *Facilitating conditions does not influence citizens' behavioural intention to adopt e-government systems.*

H9 (a1): *Facilitating conditions influences citizens' behavioural intention to adopt e-government systems.*

H9 (b): *Facilitating conditions positively influence citizens' use behaviour of e-government systems.*

H10 (a0): *Quality of services and information does not influence citizens' use behaviour of e-government systems.*

H10 (a1): *Quality of services and information influences citizens' use behaviour of e-government systems.*

Several researchers have observed that citizens' behavioural intention towards e-government has a positive influence on their use behaviour (Venkatesh et al., 2012; Alshehri, 2012; Venkatesh et al., 2003). In the realm of e-government adoption and utilisation, dimensions of

behavioural intention are two-fold: "intention to use and predicted use of e-government services" (Alshehri, 2012:79; Benbasat & Barki, 2007; Rogers, 2003). Furthermore, the relationship between behavioural intention to use and actual usage of e-Government system is well documented (Alharbi & Drew, 2014; Alwahaishi & Snasel, 2013; Alshehri, 2012). Venkatesh et al., (2003 & 2012) recommend researchers to adapt the UTAUT models to suit different circumstances and domains to thoroughly deal with unique characters of the latter. Following Venkatesh et al.,'s (2003) recommendation, the researcher has constructed the above hypotheses based on direct determinants and moderators considered to be pertinent to the G2C domain as outlined in Figure 3-9.

3.7 A Conceptual Model for People-Driven e-Government Adoption and Utilisation

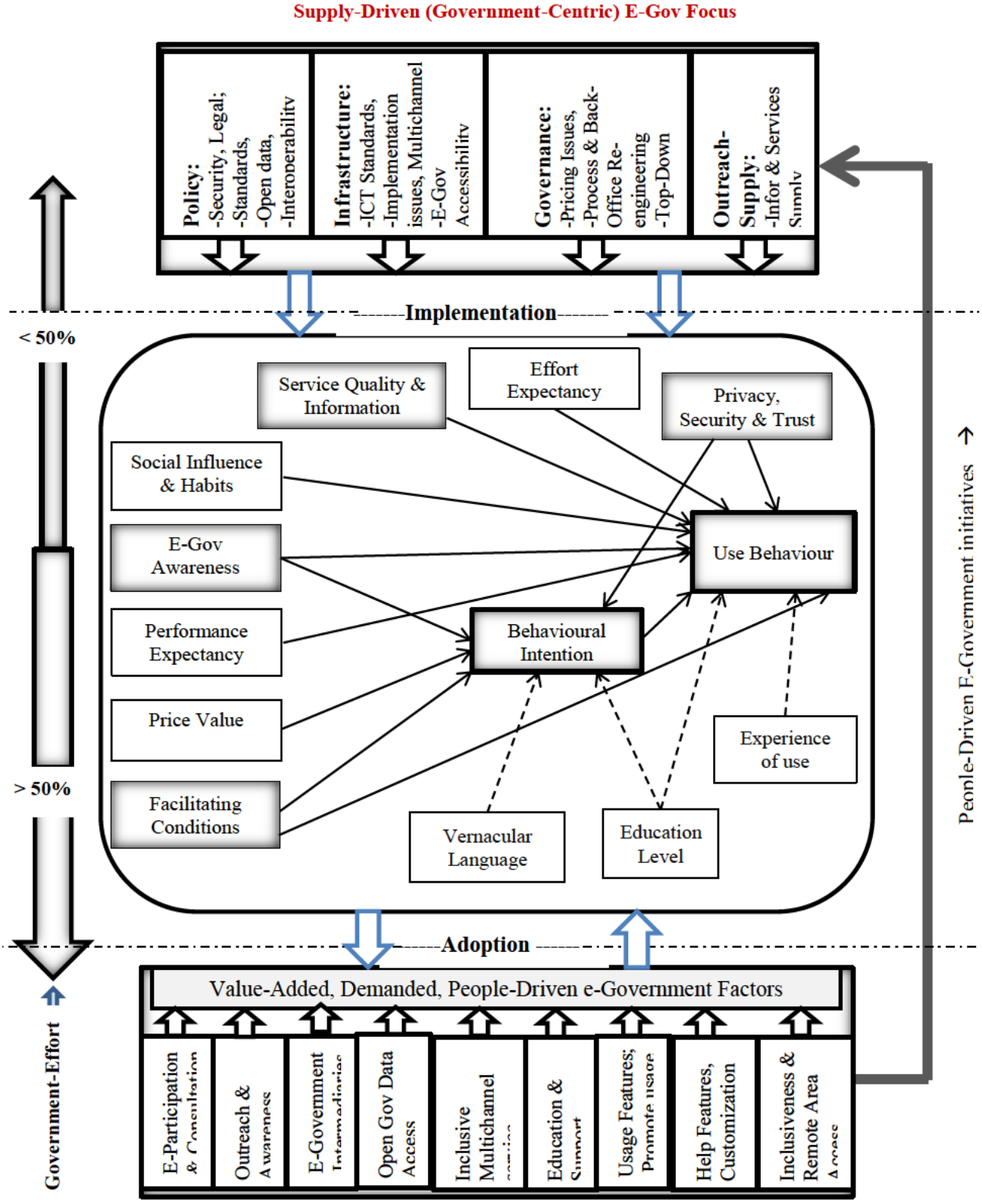
Figure 3-9 illustrates the People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model for this study proposed based on critical analysis of the literature on models and frameworks of technology acceptance, adoption and implementation discussed above. The underlining philosophy behind the people-driven model of e-government is that "citizens determine their own needs independently from authorities and find solutions in partnership with governments" (United Nations, 2016:51). Unlike in the citizen-centric model where the government knows and anticipate citizens' e-government service needs, in the people-driven model citizens and the corporate world knows what e-government services they want and pro-actively contribute ideas towards the e-services they want. The people-driven model of e-government has led to a new concept and approach to e-government adoption and utilisation generally referred to as 'MyGov' or 'government-with-you' (United Nations, 2016). Therefore, this study provides a new paradigm for e-government adoption, in which governments do not compel citizens to utilise e-government systems; but rather listens to their views and inputs regarding their desired e-government systems. In this set-up, citizens will adopt and utilise e-government systems based upon their understanding and belief of the derived befits.

Insights regarding the shortcomings of existing e-government adoption and utilisation models have been addressed in PDEGAUM and the model shall be further refined in Chapter 8 based on results findings in Chapter 6 and Chapter 7. The major goal of the PDEGAUM research model is to determine major factors from both the supply-side (government-centric) and

demand-side (people-driven); as well as those factors that influence users' beliefs, behaviour and intentions to utilise e-government services. Moreover, the researcher has realised that the PDEGAUM model should cater for existing e-government projects that were implemented by governments without the involvement of citizens. To ensure the acceptance and utilisation such existing e-government systems by citizens, the proposed model recommends governments to have outreach and awareness programmes.

The PDEGAUM model attempts to harness the gap that exists between purely supply-driven e-government systems (which is widely adopted by most developing nations) and people-driven e-services (common in developed nations) so that re-engineering process of the existing and new e-government systems meet the demands and needs of citizens; leading to optimal utilisation of the e-services.

In Figure 3-9 the dotted/dashed arrows connecting (vernacular language and level of education to behavioural intention; level of education and ease of use to use behaviour) shows the direct effects on these variables on use behaviour. This is a deviation from the UTAUT models in which experience, age and gender are considered to have moderating effect on behavioural intention to use. The solid arrows linking the major constructs and behavioural intention and use behaviour shows direct effect on each of them. Horizontal dashed lines, one for the adoption and the other one for implementation shows that these two aspects are not alienated. The model posits that effective e-government systems or any reengineering processes should be informed by catalyst factors (citizen centric). Hence, the people driven e-government initiatives upward arrow on the right of the diagram linking people-driven catalyst factors and supply driven e-government initiatives. The PDEGAUM model assumes that the contracts of e-government awareness, social influence and habits; and privacy, security and trust have direct influence on both one's behavioural intention and on the actual use behaviour – this is a deviation from the traditional adoption models and a novel approach explored.


Supply-Driven (Government-Centric) E-Gov Focus
Policy: -Security, Legal; -Standards, -Open data, -Interoperability
Infrastructure: -ICT Standards, -Implementation issues, Multichannel -E-Gov Accessibility
Governance: -Pricing Issues, -Process & Back-Office Re-engineering -Top-Down
Outreach-Supply: -Infor & Services Supply
Implementation
< 50%
Service Quality & Information
Effort Expectancy
Privacy, Security & Trust
Social Influence & Habits
E-Gov Awareness
Performance Expectancy
Price Value
Facilitating Conditions
Use Behaviour
Behavioural Intention
Experience of use
Vernacular Language
Education Level
> 50%
Adoption
People-Driven E-Government initiatives
Government-Effort
Value-Added, Demanded, People-Driven e-Government Factors
E-Participation & Consultation
Outreach & Awareness
E-Government Intermediaries
Open Gov Data Access
Inclusive Multichannel
Education & Support
Usage Features; Promote usage
Help Features, Customization
Inclusiveness & Remote Area Access
People-Driven E-Government Catalyst Factors

New constructs of the PDEGAUM conceptual model

1. **E-Government Awareness** – is the state of the minds of the general public of being conscious of the existence of public services and products online. Al-Jaghoub, Al-Yaseen and Al-Hourani (2010) posit that e-government awareness is a pre-requisite for e-government adoption and utilisation; and as such governments should devise effective outreach mechanisms and through various media to create awareness and engage citizens on e-government matters.
2. **Service Quality and Information** – the quality of e-government focuses on web site design, services and the availability of up-to-date information (Papadomichelaki & Mentzas, 2012). The focus of this study is to the accuracy, freshness and website design in terms of one being able to complete a task using minimum possible forms.
3. **Privacy, Security, and Trust** – this is a compound construct that measures three related aspects. According to Papadomichelaki and Mentzas (2012), trust is a combination of privacy and security. It is the confidence that citizens have on government portals concerning the lack of restrictions, absence risk, any doubts about information censoring (Zhao & Zhao, 2010). Privacy is concerned with safeguarding the personal information of e-government users, ensuring that no unauthorised dissemination of personal information takes place, guarding anonymity, safe "archiving of personal data, and providing informed consent" (Papadomichelaki & Mentzas, 2012: 101). Lastly, security is the safeguarding of transactions of e-government system users against fraudulent activities that may lead to citizens lacking trust on e-government services. This is an essential construct that affects both users and non-users of e-government and according to the UN E-Government Survey (2016), this is exacerbated by a government's governance track record.

The PDEGAUM conceptual model has three major entangled components, the top portion (Traditional Government-Centric e-Government) constitute salient factors associated with minimal consultation with citizens when implementing e-government. The middle section constitutes the core e-government adoption, acceptance and utilisation factors at interplay to influence one's decision to use or reject e-government services. The bottom part constitutes the catalyst factors (citizens' standpoint) that should be incorporated by the government when planning for rolling out and re-engineering e-government systems.

The middle part (adoption and utilisation) of the PDEGAUM model illustrate fundamental relationships, inspired by the UTAUT model that influence one's behavioural intention to adopt and use e-government systems. The PDEGAUM model includes only those relationships considered to be pertinent and influential to developing nations. In the context of e-government, satisfied e-government users are expected to continue using such e-services, leading to the developing some repeated patronage. Basically, citizen loyalty is measured by the frequency of citizen's continued utilisation of e-government services within the past three months (Dick & Basu, 1994). This is catered for in the PDEGAUM model by incorporating a Service Quality determinant component, which is more pertinent to those citizens that use e-government. In this regard, Service Quality is constituted of two fundamental aspects, namely information quality (IQ) (Detlor, Hupfer, Ruhi & Zhao, 2013) and system quality (SQ). IQ pertains to accurate information that is free from errors and always up to date; whilst SQ relates to e-government website that works correctly and allows essential and straightforward transactions to users.

Additional direct determinants of behavioural intention and use behaviour incorporated into the PDEGAUM model are privacy, security and trust; and e-government awareness by citizens. Regarding moderators to direct determinants, new constructs were integrated, namely level of education of users and the user's experience in using computers, personal digital assistant (PDA), internet and e-government. The place in which a citizen resides is often associated with different levels of affluence (measured by infrastructural developments like ICTs, road networks, buildings) and this has a strong bearing on the digital divide and e-government utilisation divide. Similarly, one's level of education has a direct and strong effect on his or her level of e-government awareness and willingness to explore and utilise e-services. Furthermore, the PDEGAUM model incorporates the acceptance and utilisation aspects of e-government. Adoption and acceptance are synonymous aspects, referring to one's approval to willingly acquire and use e-government systems; whilst utilisation pertains to the frequency of use.

The far left of the PDEGAUM model indicates that a lot of government efforts should be devoted towards harnessing citizen-demanded e-services to increase the chances of e-government adoption and utilisation by citizens. Drawing upon the literature on e-government, it has been stated that government departments and agencies; together with researchers' efforts

should go conjointly with efforts to boost service demand, utilisation and derived benefits to ensure user loyalty (United Nations, 2014; Reddick, 2005; Alawneh, Al-Refai & Batiha, 2013; Deng, Turner, Gehling & Prince, 2010).

3.8 Chapter Summary

This chapter sought to answer research question three and objective number four, regarding possible ways and models that can be used to predict e-government adoption and utilisation; focusing on the G2C domain. The research question was answered in different sections of this chapter through analysis and critiquing of relevant theories, factors, and models considered most pertinent to influence users' (e-government users) decision to accept and continue using e-government systems. Convergence of consensus in literature was evident, relating to the significance of individual factors in influencing e-government adoption and utilisation. Reflecting on the analysed models in this chapter; only the UTAUT model and International Telecommunications Union's core indicators on ICT infrastructure and access has attempted to incorporate individual factors impacting ICT uptake. Close analysis of these two models indicate that they do not address some of the critical individual factors like users' level of education and explanation on how the entire acceptance models relate to different aspects of e-government adoption; namely how to harness supply-driven and demand-driven initiatives to increase e-service uptake and maintain user-patronage. In addition, deeper analysis of the evolution of the UTAUT model from the previous eight technology acceptance models (Figure 3-6) is deeply rooted in behavioural, psychological and sociological aspects of ICT system users; thus paying little attention to external factors relating to the actual systems and how governments can roll-out on-demand e-services. In this context, there was a scant reference in existing models on how the models can adequately assist e-government project champions and decision makers in coming up with people-driven e-government services that increase utilisation.

This study intends to address this identified research gap by establishing new constructs and individual factors pertinent to developing nations, specifically the SADC region, and use them to advance research hypotheses. The correlation and significance of the constructs shall be established in results analysis in Chapters six, seven and eight.

Finally, by devoting special consideration to developing nations' settings, this chapter has accomplished the goal of proposing the initial conceptual model aimed at bridging the two extreme ends of e-government provision, namely supply-driven and demand-driven; coupled with adapted acceptance models. The conceptual model contributes to the explicit understanding of e-government initiatives and how governments can either come up with on-demand new e-services or re-engineer existing ones to meet user demands and extend utilisation, leading to e-government service loyalty. Therefore, PDEGAUM model is an essential novel descriptive tool that aids in understanding how to organise and analyse factors that affect e-government adoption and utilisation.

The next chapter (4) outlines the research methodology for this study.

Chapter 4: Research Methodology

Chapter Overview

This chapter outlines key research design strategies, information, philosophical suppositions, and resources underpinning the research study. The information establishes the roadmap for the crucial decisions and methods to be undertaken by the researcher based on the research problem and the best way to investigate it. Collectively, this represents the most appropriate approach required for developing empirical knowledge. There are several research approaches and techniques for research design. However, their suitability for use depends on the research problem and aim. The aim of this study is to identify how e-government systems are utilised by citizens in the SADC region in order to advance an e-government adoption and utilisation conceptual model suitable for developing countries.

4.1 Research Methodology Overview

E-Government services are focussed and constrained by a combination of cultural, economic, human capital, legal, organisational, political, social and technological factors (ITU, 2008). Partnership on Measuring ICT for Development (2011), claim that there is no all-inclusive models and approaches that exist for use in the study of e-government because of its diversified and interdisciplinary nature. Therefore, the methodology implemented in this study is guided by the research questions and aim. World over nations is undergoing a metamorphosis by re-engineering their service delivery systems through e-government in an endeavour to improve efficiency in internal operations and in service delivery to customers. This transformation process, however, in the context of developing nations is faced with challenges in adoption and utilisation of the services (Alomari, 2014; Matavire et al., 2010; United Nations, 2014). It is for this reason that this chapter identifies and crafts the most suitable research strategy and approach to address these challenges.

Research involves generating new knowledge, ideas, methodologies and comprehension of concepts based on a synthesis of prior studies (HERDC, 2014). On the other hand, research methodology represents a work plan for solving the identified problem for research (Rajasekar, 2006). The research methodology "directs the whole endeavour: it controls the study, dictates how the data are acquired, arranges them in logical relationships, sets up an approach for refining and synthesising them, suggests a manner in which the meanings that lie below the surface of the data become manifest, and finally yields one or more conclusions that lead to an expansion of knowledge," (Leedy & Ormrod, 2010:7). The choice for the most suitable research methodology is fundamental in order to attain credible and high-quality results. Guided by the research problem the researcher should determine the best approach based on the strengths and weaknesses of each approach. According to Creswell (2003), the following essential factors have to be considered when making decisions: the research problem, the study topic, underlying research questions and the associated objectives, the level of engagement required with the study sites and the researcher's familiarity with an approach.

The next section discusses the research methodology approach in detail.

4.1.1 Research Paradigm

A research paradigm engages with the philosophical-dimensions of social sciences (Jonker & Pennink, 2010). It represents important suppositions and beliefs for viewing the world, which act as a theoretical lens guiding the researcher throughout the research process (Wahyuni, 2012). Before any study can be conducted, it is essential for the researcher to outline the research paradigm to be adopted, because it extensively influences how the research is conducted (Creswell, 2009; Neuman, 2011). This research study seeks to understand socio-technical phenomena regarding the adoption and utilisation of e-government services by citizens in the SADC region.

Ontology and epistemology are the two basic philosophical-dimensions that differentiate research paradigms and shape the way we believe and think about the world around us. Ontology refers to the social nature of knowledge of entities investigated, in which reality is always studied using objectivism and constructionism (Bryman, 2004; Dieronitou, 2014).

According to Bryman, objectivism suggests that social-reality exists independent of the researcher's cognizance. Constructionism, in contrast, holds that social actors (referred to as actor-networks in Callon (1986) produce social-realities as a result of social contact leading to deeper understanding and changing of views by researchers about the subject of inquiry.

On the other hand, epistemology seeks to answer the question, "what is known and what are the sources and limits of knowledge?" (Ericksson, 2007:14). Epistemology, therefore, embodies an understanding of the scope and legitimacy of what is regarded as acceptable knowledge within a particular discipline and ways of acquiring and disseminating it to others (Al-Saadi, 2014). Therefore, whatever epistemological suppositions we hold as researchers about the specific knowledge they greatly influence how we discover that knowledge. Similarly, Al-Saadi (2014:2) outlines that when a researcher regards knowledge as "hard, objective and tangible," it calls for the researcher to assume an observer-role, employing natural science methodologies like testing, experiment and measurements. However, if knowledge is considered "personal, subjective and unique," then the researcher is confined to adopt subjective-oriented approaches to social science research associated with qualitative research (Al-Saadi, 2014:2).

Neuman (2011) subdivides the ontological and epistemological philosophical positions into four major distinctive groups: positivism, post-positivism, interpretivism and pragmatism. Their key differences and suitability for use in a particular research study are outlined in Table 4.1.

Besides the ontological and epistemological philosophical standpoints to research, axiology and methodology are the other two additional beliefs that affect how we investigate reality. Axiology involves the intrinsic values, principles and ethical concerns that researchers should uphold to realise a credible and valid research (Wahyuni, 2012). In this regard, the axiology that underpins this study is the ethical clearance letter issued by the UKZN Human and Social Sciences Ethics Committee (see Appendix 5) and a host of researcher-to-participants' issues to do with confidentiality and anonymity. On the other hand, Wahyuni (2012) identified the methodology as a model for carrying out a research undertaking guided by a specific paradigm. This study, therefore, adopts the pragmatist research paradigm as the most suitable philosophical stance underpinning this research study.

Table 4- 1: Fundamental Beliefs of Research Paradigms

	Research Paradigms			
Fundamental Research Beliefs	*Positivism (Naïve realism)*	*Post positivism (Critical Realism)*	*Interpretivism (Constructivism)*	***Pragmatism***
Ontology	External, objective and independent of social actors	Objective. Exist independently of human thoughts and beliefs or knowledge of their existence, but is interpreted through social conditioning.	Socially constructed, subjective, may change, multiple	External, multiple, view chosen to best achieve an the answer to the research question
Epistemology	Only observable phenomena can provide credible data, facts. Focus on causality and law-like generalisations, reducing phenomena to simplest elements	Only observable phenomena can provide credible data, facts. Focus on explaining within a context or contexts	Subjective meanings and social phenomena. Focus on the details of the situation, the reality behind these details, subjective meanings and motivating actions	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology	Value-free and etic Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Value-laden and etic Research is value-laden; the researcher is biased by world views, cultural experiences and upbringing	Value-bond and emic Research is value bond, the researcher is part of what is being researched, cannot be separated and so will be subjective	Value-bond and etic-emic Values play a a large role in interpreting the results, the researcher adopting both objective and subjective points of view
Research Methodology	Quantitative	Quantitative or Qualitative	Qualitative	**Quantitative and qualitative (mixed methods design)**

(Source: Wahyuni, 2012; Saunders et al., 2009; Guba & Lincoln, 2005).

4.1.2 Research Design

A research design refers to the overall approach chosen by the researcher for combining various elements of a "study in a coherent and logical way" to adequately address the research problem (Labaree, 2013:2). It ensures that whatever results obtained from the inquiry actually answers the research questions convincingly. There are basically four major types of research design, categorised based on the objectives of the inquiry: exploratory, descriptive, explanatory and transformational (Elahi & Dehdashti, 2011). Explanatory research design focuses on discovering new insights and ideas using less rigorous qualitative methods and expert surveys. It is widely used when the current literature in a specific field of study does not address the investigated problems and more studies are indispensable. This approach does not help the researcher in answering the 'what', 'how' and 'why' types of research questions sought by this study and is used. Descriptive design, in contrast, is used to ascertain facts and relationships between variables. It seeks to answer the question of '*what* is going on?' using quantitative and logical approaches cross-sectional studies; ignoring the 'how' and 'why' questions under investigation. In this regard, the research design is not suitable for this study. Explanatory design, also referred to as an analytical study, is highly structured in nature and focuses on establishing any causal relationships between studied variables of the research problem to answer the question of '*why* is it going on?' Transformational design (Burns, Cottam, Vanstone & Winhall, 2006), seeks a better understanding of the "drivers, processes and content of planned, second-order change, defined as transformational change" (Sangiorgi, 2011:31) for the social progression of communities to establish a sustainable human-centred service. The transformative perspective is most suitable for use in mixed methods-oriented frameworks to answer the research problem. The researcher adopts a transformational research design for this study, utilising theoretical lens (UTAUT and e-Government Implementation Toolkit) to frame the quantitative and qualitative data collection instruments for the case study.

This study seeks to understand the existing e-government initiatives, challenges faced by citizens in their endeavours to adopt e-government systems in two SADC countries. The research aims to unearth e-government service utilisation, challenges encountered and highlight current ways of assessing e-government adoption by governments and its utilisation by citizens.

To achieve this, the researcher shall apply an explanatory sequential strategy, in which the quantitative data gathering and analysis is completed first. This is then followed by the second

phase of qualitative data gathering and analysis processes aimed at gaining in-depth insights into the quantitative results. Therefore, it should be clarified at this point that the combination of both quantitative and qualitative methodologies and their methods are not specifically for comparative analytical and triangulation purposes. Rather, they are intended to strengthen the study through the utilisation of multiple data collection methods (Creswell, 2014; Terrell, 2012).

4.1.2.1 Survey Research Design

A survey is affiliated with the deductive research in which questionnaires are the major instruments used to gather data about the traits, attitudes and opinions of a population regarding the studied phenomenon (Rahi, 2017). Therefore, the primary goal of the survey is to yield quantitative explanations of the investigated population in line with: the interrelationships between and among variables, using a highly structured set of questions and the information is collected from a representative sample of the population with the end goal of generalising the findings. In a survey study, the researcher is more concerned with getting responses from the participants regarding "what is happening?", and "how is it happening?" in-line with the investigated phenomenon (Recker, 2013:76).

This study seeks to establish what e-government systems are in place for access by citizens in Zimbabwe and Zambia, how and why are citizens using or not using such systems. By so doing, the study will establish the salient factors that are affecting citizens' behavioural intention and capacity to adopt and use e-government systems. Hence, the survey design is suitable for establishing the significance of the variables of the model proposed in Chapter 3 and to determine the model fit.

4.1.2.2 Case Study

A case study is an "inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident," (Yin, 2009:18). Yin (1994) suggests that case study research design is suitable for studies seeking to explain, explore or describe phenomena occurring in everyday life and

context. The fundamental precept in a case study is to explore in-depth a phenomenon in its natural setting so as to gain an insight into its occurrence.

The types of research questions that the study seeks to answer are the determinant factor for the choice of the most appropriate research design. The case study approach is most suitable for use when the study seeks a deeper and detailed inquiry about the 'how' and 'why' research questions, (Yin, 1994). Furthermore, this approach is suitable for investigating events in which the researcher is unable to manipulate the relevant behaviour of interest being studied. Table 4-2 summarises another way of classifying the research design, the set of research questions to determine the suitability of a research design to adopt for a study and the control measures that a researcher possesses over the behaviour of contemporary events (Yin, 1994). Most of the research questions for this study are of the 'how,' 'why' and 'what' nature in which the researcher has no control over the behaviour of citizens to e-government adoption and utilisation. Benbasat (1987) further states that the case study is most suitable in cases where the researcher intends to gain valuable insights into emerging topics in the ever-changing Information Systems field.

Table 4- 2: Guidelines for choosing Research Design Strategy

Research Design Type	**A form of Research Question**	**Control Over Behaviour**	**Thrust on contemporary events**
Case Study	How, why, what	No	Yes
Survey	Who, what, where, how many, how much	No	Yes
Experiment	How, why	Yes	Yes
History	How, why	No	No
Archival Analysis	Who, what, where, how many, how much	No	Yes/No

Source: (Yin, 1994)

There are two major ways to categorise case studies: single and multiple. Each approach seeks to analyse the contextual state of affairs in relation to the case and it can either adopt a holistic

(uses a single-unit of analysis throughout) or embedded (uses multiple-units of analysis throughout) approaches (Yin, 2009; Rowley, 2002). In a single case research design, the "phenomena of interest are studied using a single subject or a small group of research subjects (also referred to as N-of-1 designs or single-subject research)" (Nock, 2007:337). The goal is to gain valuable in-depth information and rich descriptions about a single studied subject; in this context a particular country. The rationales (Yin, 2009) for choosing a single case design are;

- When it adequately represents the case in question in confirming, challenging or extending a well-formulated philosophical stand-point to derive new insights (this is synonymous with single-experiment).
- Where the case in question denotes "an extreme case or a unique case" (Yin, 2009:47) warranting a single case design as the best approach to gain insight.
- The representativeness (*typical*) of the case study – the investigated aspects of a particular instance of a case (sample) can be trusted to be typical of the insights gained about the experiences of the average person utilising e-government services in a city or country.
- When it unveils a *revelatory case* – when the researcher seeks the chance to "observe and analyse a phenomenon previously inaccessible to social science inquiry" (Yin, 2009:48).
- Need for *longitudinal* case – entails studying two or more cases over some specified time intervals in order to gain insights and trends leading to new knowledge building and conclusions.

Multiple case studies are considered more robust (Yin, 2009) as it seeks to strengthen the final results of the study by duplicating pattern-matching (Yin, 1994). Key aspects underpinning this design are that it either yields literal replication (comparable discoveries), totally contrasting discoveries or theoretical replication. Therefore, the underlying rationale for differences with single case design is on replication as distinguished from sampling designs. Upon finding crucial information to research questions in a single case, the researcher conducts N more case(s) with or without altering the data collection instruments used in the first study.

The justification for using multiple-case study in this investigation is that every case is "carefully selected so that it either (a) predicts similar results (a literal replication) or (b)

predicts contrasting results but for anticipatable reasons (a theoretical replication)," (Yin, 2009:54). Furthermore, Yin, recommends that researchers should strive to use multi-cases as long as they have adequate access to the cases – for replication purposes and to gain an in-depth understanding of the causals for the underlying problems (Abdalla, 2012). Hence, this research study focuses on two different countries for this purpose – namely Zambia and Zimbabwe.

4.1.3 Research Approach

This section answers the critical question about the most suitable research approach to investigate the adoption and utilisation of e-government initiatives in the SADC region. A research approach is a "systematic and orderly approach taken towards the collection and analysis of data so that information can be obtained from those data" (Abdalla, 2012:80). Creswell (2005) says that a research approach is a plan and all procedures that must be executed in a research; spanning all the crucial steps from broad assumptions of the study to comprehensive procedures of data-collection, data-analysis, data-interpretation; and data-quality and rigour controls. There are basically three distinguished research approaches that can be adopted in a particular research study: qualitative, quantitative and mixed methods. The overall decision for determining the most suitable research approach for studying the topic on e-government adoption and utilisation by citizens should not be haphazardly taken; but be informed by a number of key factors: the nature of the problem, the aim and objectives of the inquiry, philosophical assumptions underpinning the study, the research-design; research-methods of data collection, analysis, and interpretation; personal experiences of the researcher and the targeted audiences of the study (Curry et al., 2009). The researcher should, therefore, take into account all these crucial factors when deciding on the most appropriate research approach to adopt.

The next section addresses the unique traits of these three main research approaches, drawing attention to their suitability, weaknesses and strengths.

4.1.3.1 Qualitative Approach

The qualitative research movement emanated from the field of social sciences with the intention of giving researchers an approach that could be used to study social and cultural phenomena in their natural settings. The approach is most suitable for use when the study seeks to "answer questions about the '*what*', '*how*' or '*why*' of a phenomenon rather than '*how many*' or '*how much*', which are answered by quantitative methods" (Patton & Cochran, 2002:3). There are as many definitions of qualitative research approach as there are authors on the topic. However, most of the researchers (Merriam, 2009; Parkinson & Drislane, 2011) point out that narrative or descriptive data (as opposed to quantifiable data) are collected from participants through intense contact with the participants in their natural settings using methods such as case studies, interviews, focus groups and observations for discourse analysis.

The qualitative approach seeks to understand the motivation of why participants undertake certain activities and their interpretation of personal experiences (MacDonald & Headlam, 2011). When qualitative data is collected properly, it is rich in context and provides essential explanations for understanding hidden complex phenomena and dynamics of the social world. Such data is essential for social-decision making and advancing of social agendas for the communities. Furthermore, a qualitative research approach contributes to theory or theoretical model building, policy-making and triggers social-awareness for decision making. All these features of the qualitative approach support the researcher in advancing the goal of understanding citizens' adoption and utilisation of e-government systems in the two countries. The quantitative approach on its own cannot adequately describe the social complexities involved in citizens' decisions on utilisation and non-utilisation of e-government because technological, political, economic and social factors are at play. On its own, the quantitative approach cannot yield the required complex results.

However, the qualitative research approach has its own pitfalls. Chief amongst them is that amount of complex and rich data is generated, posing a threat to data analysis, given the limited timeframe required for analysis. Furthermore, the approach gives too much room to both the researcher and participants for personal interpretation; thus creating room for bias. Quite often, qualitative research normally uses small and non-probability sampling, and the "ability to claim a representative sample is often diminished, and statistical generalisation is impossible" (Guest et al., 2012:25). Questions about the qualitative approach are usually inductive and open-ended,

and this is not an ideal approach for objectives that require testing and calling for a comparison of variables within groups. Finally, the entire process is dynamic and circumstances for the targeted group or case may change over time; especially if targeted for longitudinal study and this poses threats to research validity and reliability (Loh, 2013). Table 4-3 summarises the strengths and weaknesses associated with deploying the qualitative research approach.

Table 4- 3: Strengths and Weaknesses of Qualitative Research Approach

Strengths	**Weaknesses**
Qualitative enquiry permits a comprehensive and rich narrative	Qualitative data is challenging to analyse and requires excellent interpretative-skills
The approach endeavours to take into consideration perspectives from various participants	Paves room for bias
Does not reduce complex human experiences to numerical form and allows a good insight into the person's experiences and behaviour	Very difficult to generalise qualitative data
Results are said to be rich, deep and meaningful	Qualitative faces difficulties in terms of comparisons
Ambiguities which are inherent in human language can be recognised in the analysis	Low level of accuracy in terms of statistics

(Source: Abdalla, 2012; Bernard, 2012)

4.1.3.2 Quantitative Approach

The quantitative research approach is concerned with quantifiable data to answer the 'how much', 'how many', 'how often' questions of inquiry. It seeks to find out if and how the targeted population knows something, and then devices ways to numerically represent the findings based on statistical principles. The ultimate goal of this approach is to generalise results of a sample of the entire population (MacDonald & Headlam, 2011).

Moreover, the quantitative research approach uses questionnaires, experiments, surveys and mathematical modelling to gather numerical data and perform tests. These approaches require the researcher to use close-ended questions – thus limiting the responses from participants to

the answers identified by the researcher (Tewksbury, 2009). A quantitative research approach is considered most suitable for use where there is strong theoretical underpinning; seeking to prove or disapprove established hypothesis and in cases where primary data is to be generated from a large number of sources, (Yilmaz, 2013). Furthermore, quantitative methodologists argue that the larger the sample size, in relation to the entire population, the better the findings, (Kura, 2012). The approach bears the strength of generalising research findings to the entire population and minimises researcher bias in data analysis; often brought by differences in researchers and participants' experiences in the qualitative research approach.

Despite its distinguished strengths, the quantitative research approach is often criticised for its lack of rigour – citing negligence of socio-cultural-context of phenomena under investigation at the expense of numerical representation (Harwell, 2011; Cohen et al., 2007). Additionally, the approach places more emphasis on existing theory or hypothesis testing (confirmation bias); thus rendering it less relevant for novel theory building.

4.1.3.3 Mixed Methods Approach

According to Johnson et al., (2007:123) mixed methods research is that "type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration." Johnson et al., (2007) further identifies three subdivisions of the mixed methods approach: qualitative-dominant, pre-mixed, and quantitative-dominant. The difference amongst these three continuums lies on whether the mixed methods approach implemented is biased towards a qualitative approach, quantitative approach or just assumes equal significance of the two extreme approaches in the understanding phenomenon of interest under investigation. On the other hand, Creswell and Plano Clark (2007) identify four major design types for mixing methods, each one possessing multiple variants: the triangulated-design aimed at gathering "different, but complementary data"; the embedded-design focused on one data-set providing a "supportive secondary role"; two-phase-explanatory-design aimed at building and clarifying quantitative results; and the exploratory-design (Lisle, 2011:94). Mixed methods research intentionally combining these methods to draw on the strengths of each to frame the investigation within philosophical and theoretical positions.

The decision to use mixed methods approach in a research study should be guided by the fact that neither a quantitative approach nor a qualitative approach can sufficiently answer research questions for the study (Creswell, 2013). Furthermore, Creswell identifies key factors that should be considered by researchers to justify the use of a mixed methods approach in a study: the overall intent of the study, the quantitative and qualitative data to be collected and analysed to address the research intent (both closed-ended and open-ended elements should be evidenced), the feasibility and realisation of your procedures, whether you plan to use theoretical lens for the study or advance your own philosophical stance; and your rationale in adopting the mixed methods approach.

Whilst the mixed methods approach bear strengths in solving problems requiring both generalisation and understanding of ideas, however, has its own pitfalls: the research-design can be quite complex, requiring more time and resources for implementation and how to resolve discrepancies arising from the interpretation of qualitative and quantitative results.

Mixed methods design can be implemented in many different ways (Creswell, 2013, 2014; Creswell & Plano Clark 2007; Tashakkori & Teddlie, 2003; Onwuegbuzie et al. 2007). Creswell (2013) identifies two ways of implementation, the basic design or advanced design – each of which has three options. The mixed methods basic design embraces:

- The convergent parallel design in which the quantitative and qualitative data collection and analysis are carried out separately and their results merged for comparison and interpretation.
- Explanatory sequential design in which the researcher first collects quantitative data, analyse it to obtain the results which then pave way for the collection of qualitative data and analysis to solicit for further explanation and deeper understanding of the quantitative results.
- The exploratory sequential design which commences by collecting and analysing qualitative data to obtained results. These results are then used for formulating some variables, themes and hypothesis, design quantitative data gathering instruments and interventions which lead to the collection and analysis of quantitative data for obtaining new insights and interventions into the research problem.

On the other hand, the advanced mixed methods design has three options: intervention design, transformative design and multiphase design. However, the selection of a particular design for implementation in a study should be realistic and feasibly assessed against the time available to carry out the study, availability of funds, and possession of adequate skills by the researcher to carry out the study (Durham et al., 2011; Creswell, 2014). Given the background that the data collection and analysis of this study should be completed within a defined period of time using a constrained budget, thus the study adopts the explanatory sequential design. Rigorous quantitative data collection procedures and analysis are undertaken in the first phase; followed by qualitative data gathering using purposive sampling and semi-structured questions. As suggested by Creswell, (2014), the qualitative data gathering process builds on and substantiates the quantitative data already collected and analysed. Table 4-4 outlines major differences amongst the qualitative, quantitative and mixed methods approach to research.

Figure 4-1 outlines a summary of the overall research methodology adopted for this study. The solid lines show the path adopted by this study from the pragmatic research philosophy, to mixed methods research approach, to survey and case study research design; and finally to four methods of data collection used (questionnaire, interviews, document analysis and field notes). Therefore, the dotted rounded edged rectangular shape shows the adopted philosophy, approach, design and methods adopted by the study.

Table 4- 4: Comparison of Research Approaches

Comparison aspect	Quantitative	Mixed Methods	Qualitative
Aim	Aims at counting things and explain what is observed.	Aims at giving a detailed narration and counting of observed scenarios.	Aims at giving a complete, detailed narrative of observed things.
Purpose	Generalisability, prediction, causal explanations	To provide the multi-lens focus of generalisability and trustworthiness.	Contextualisation, interpretation, understanding perspectives
General framework	Seeks to test hypotheses about phenomena under investigation.	Multiple foci: discovers phenomena and test hypothesis for in-depth insights and not triangulation purpose.	Seeks to discover phenomena
Tools used	Researcher uses surveys and experiments to gather numerical data	Uses a combination of tools regarded fit to collect multi-variant data	The researcher is the major data gathering instrument
Sample size	The typically large sample to represent the targeted population (selected using probability sampling techniques)	Seeks to strike a balance between reasonable sample size and representativeness.	Normally small and non-representative sample size (selected using convenience or purposive sampling technique)
Data Collected	Numerical data collected using highly structured and validated instruments (closed-ended)	Deploys multiple forms (providing explanations to the numerical data on casual phenomena)	Textual and unstructured data collected using open-ended questions
Data Analysis	Seeks to identify statistical relationships amongst variables	Combines both quantitative and qualitative analysis	Interpretive in nature – seeking to establish patterns, themes and universal-features.
Output/Results	Numerical and statistical (which can be generalised). (Statistical report).	Collaborated findings (statistical and narrative) which can be generalised.	Results in form of words, objects and viewpoints. (Narrative report).
Role of researcher	Researcher remains objectively separated from the subject matter	Combines the two extremes.	The researcher is personally absorbed in the matter researched

(Sources: MacDonald and Headlam, 2011; Mack et al., 2005)

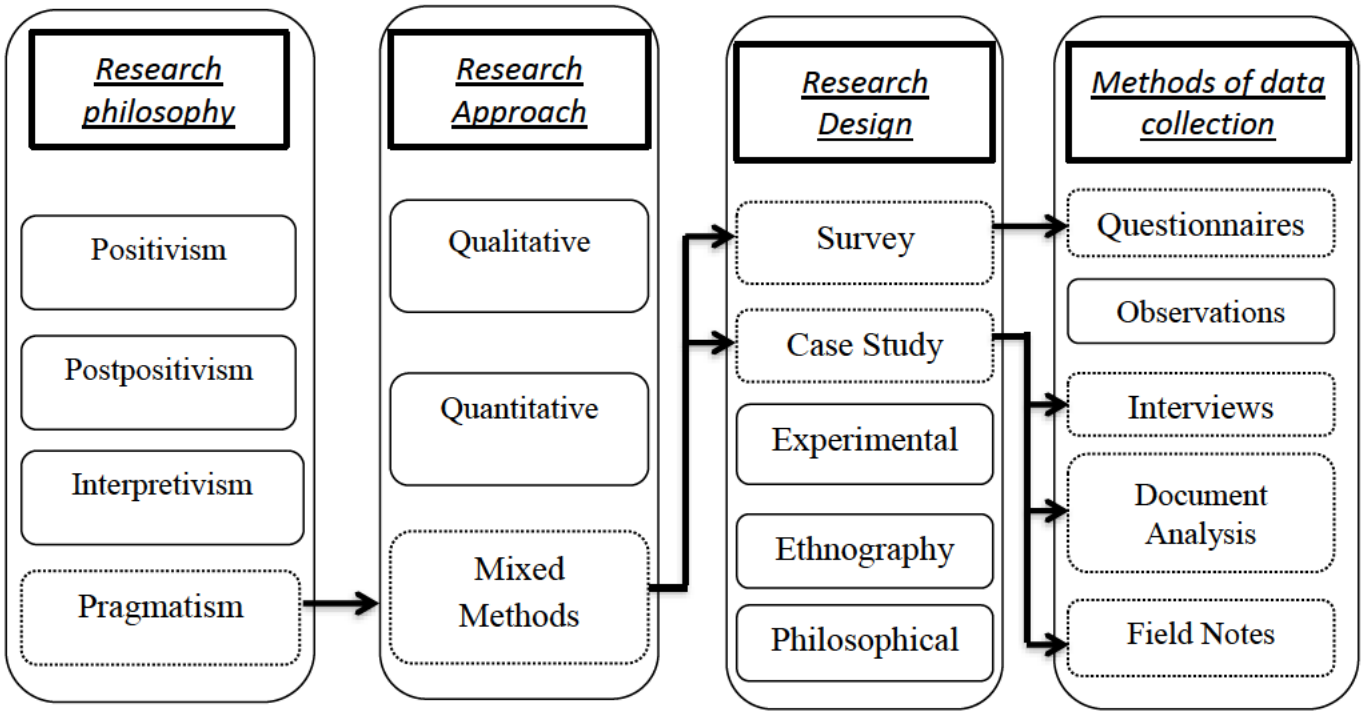


Figure 4- 1: Overall research methodology for the study

4.1.4 Case Study Sites, Target Population and Sampling Strategies

This section outlines the specific case study sites, in which the research is conducted, the targeted population for the study and the sampling strategies to be adopted in order to identify the sample for the study.

4.1.4.1 Case Study Site for the Research

According to Darke, Shanks and Broadbent (1998) study site refer to the actual physical place in which the study is conducted and from which desired data are collected for analysis to give empirical evidence. Crowe et al., (2011) recommend researchers to carefully select case study sites, bearing in mind its accessibility to individuals, organisations and whatever entities that constitute the unit of analysis for the study. The study is concentrated on two SADC countries, Zambia and Zimbabwe. The focus is on the capital cities of the two countries, namely Lusaka and Harare. It should be noted that these two cities are regarded as independent provinces

within each country. Hence the terms Harare city and Harare province are interchangeably used in this study; likewise, Lusaka city and Lusaka province.

4.1.4.2 Sampling Strategies and Target Population

In research studies, 'population' refers to "the set of units that a sample is meant to represent" (De Vaus, 2007:69). On the other hand, the term census refers to the gathering and analysis of data from all possible participants of a population (Al Khatib, 2013). In real practice, rarely do researchers embark for a complete census of the population, mainly owing to budget and time constraints (Hair et al., 2003). Since it is unrealistic to trace all components of the population, researchers should resort to carefully selected samples to represent the entire population for the inquiry (Mugo, 2002). However, the process of defining a population and obtaining a representative sample is complicated (Al Khatib, 2013). To avoid going astray, researchers should be guided by the research questions and aim of the inquiry (Wilson, 2010). According to Al Khatib (2013), a representative sample can be achieved by adopting five key sampling-procedures as outlined in Table 4-5.

Table 4- 5: Sampling Procedures for the Inquiry

Techniques	Elucidation	Inquiry Sampling procedures
Defining the Target Population	Collection of elements significant to the inquiry and have the information solicited by the inquiry. These elements are demonstrative of the target population.	*Elements:* All citizens have either used or not-used e-government systems of Zambia and Zimbabwe *Extent:* All Zimbabwean and Zambian population (citizen and non-citizen).
Choosing the Sampling Frame	A complete list of the elements used for drawing a sample.	*Sampling Unit:* Citizens and residents with the potential to access and demand e-government systems
Selecting the Sampling Method	This is guided by practical issues relevant to the inquiry: research questions, objectives, time-frame and budgets.	*Both probability and Non-Probability*: Multi-stage and Purposive Sampling Techniques
Determining the Sample-Size	Efficient sample-sizes can be drawn from either large or small population.	*Total Sample-Sizes for the inquiry:* (1). For probability: 800 – (Calculated using Equation 1) and (2). For non-probability: 8 (purposively identified).
Implementing the Sampling Plan	The final step in the actual sampling process for the inquiry.	*Study Distribution:* Paper-based questionnaire administering and face-to-face interviews. (to increase retention rate and participation)

(Source: Al-Khatib, 2013; Hair et al., 2003)

4.1.4.3 Target Population

The target population for an inquiry refers to the entire set of elements "to which the study data are to be used to make inferences," (Cox, 2008:1). The target population for this inquiry is all

the residence of Zimbabwe and Zambia aged between 18 and 75 years (both citizen and non-citizen). This study focuses on the provinces hosting the capital cities of these countries, Harare and Lusaka respectively.

The major official languages in Zimbabwe are Shona, Ndebele and English and Christianity is the dominant state religion. According to the 2012 Zimbabwe National Census, the total population of Zimbabwe stood at 13 061 239 people (ZIMSTATS, 2012a). Further, ZIMSTAT reports that a total population of 2 123 132 resides in Harare. With an estimated annual population growth rate of 3.0 %, the total population of Zimbabwe as of May 2015 was estimated to have increased to 14.23 million (The World Bank, 2015). Tangible e-government initiatives started to be noticed late in 2006 in Zimbabwe, following the passing of the National ICT Policy Framework early in the same year and the National E-Readiness Survey Report in 2005, (Ruhode, 2013). The launch of these two significant national strategic reports, followed by dedicated implementation efforts (though thwarted by the inevitable economic downfall of 2007/8) led to Zimbabwe achieving an e-government development index of 0.3585 and ranked number 126 out of 193 UN member states, worldwide (United Nations e-Government Survey, 2014). According to the Internet Usage Statistics, 47.5% of the Zimbabwean population accesses the internet (Internet World Stats, 2014). Refer to Figure 4-2 for the map of the Harare Province. However, Ruhode (2013) argues that internet usage in Zimbabwe and most developing nations across the world is heavily concentrated in urban areas. He argues that something must be done to bridge the digital divide and increase adoption through faster and allowable internet services to all citizens.

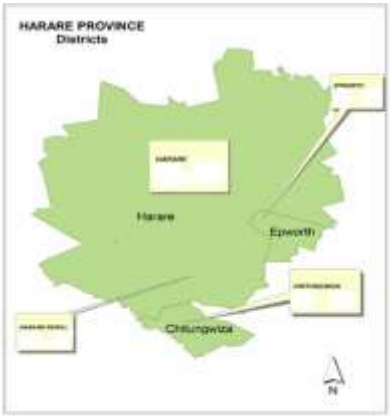


Figure 4- 2: Harare Province Geographical Regions, (Source: ZIMSTATS, 2012b)

The case study also targets Zambia, specifically focusing on Lusaka Province (See Figure 4-3). The dominant official languages of Zambia are Bemba, Nyanja, Tonga and English and Christianity is the dominant religion, practised by 87 percent of the population, (ZAMSTATS, 2011). Further, ZAMSTATS reported in the 2010 Zambian National Census that the total population stood at 13 046 508 inhabitants. According to the same report, Lusaka had a total population of 2 198 996. The Internet World Stats Report (2014) estimated the total population of Zambia to be at 15.06 million people, with an annual population growth rate of 3.2%.

The idea of e-government emerged in 2006 as a result of the quest by the Zambian government to overcome a host of challenges confronted; chief among them, corruption and poor service delivery to citizens (Bwalya, 2009). Further, in 2006, Zambia launched its National ICT policy which gave birth to the introduction of e-government initiatives in the following year to numerous governmental departments like the Ministry of Home Affairs and Immigration (Simenda, 2009; Bwalya & Healy, 2010). According to the United Nations e-Government Survey (2014), Zambia has an e-government development index of 0.3289 and ranked number 163 worldwide. However, according to the Internet World Stats report (2014), 18.0% of the total population of Zambia uses the internet.

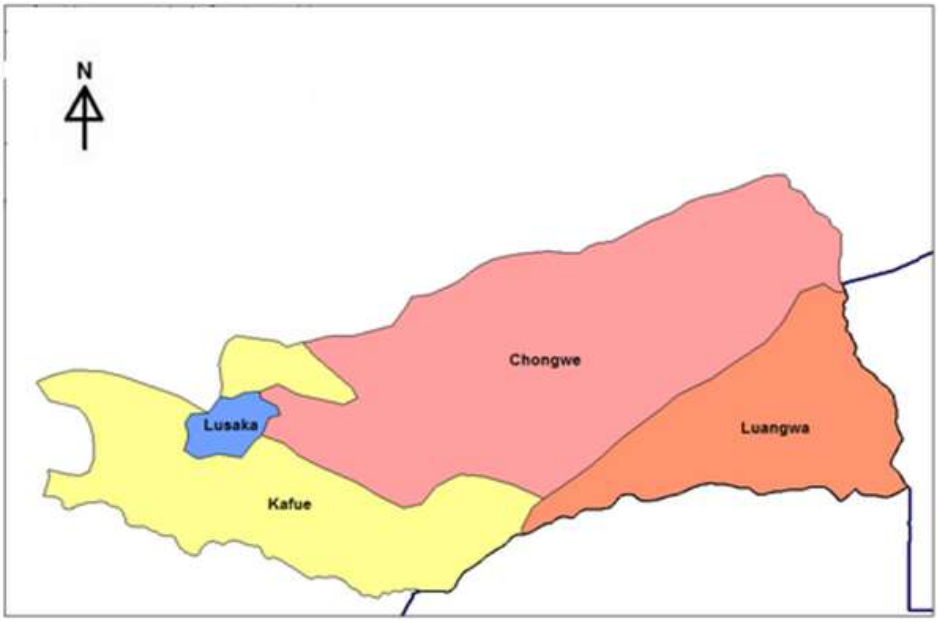


Figure 4- 3: Lusaka Province Geographical Regions, (Source: UNDP, 2013)

The major justification for selecting Zambia and Zimbabwe as the settings for this inquiry are four-folded: Firstly, because both countries are members of the Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA)

regional economic blocks – thus they can be compared in terms of performances at economic regional blocs, trade and ICT development since they have some similarities.

Further, both countries were simultaneously conquered in 1890 by the British South Africa Company, under the leadership of Cecil John Rhodes and became known as Northern Rhodesia (now Zambia) and Southern Rhodesia (now Zimbabwe) (Hungwe, 1994). In this regard, they share similar political history with economic implications in terms of civilisation, infrastructural and educational development; all worthy of assessment pursuant to e-government. Secondly, despite the two neighbouring nations having almost similar population sizes, they possess some similarities in terms of their e-government development measures (United Nation, 2016), notably Zambia is ranked at number 132 worldwide, with an EGDI of 0.3507 and a stable economy; whereas Zimbabwe is ranked 134, with an EGDI score of 0.3472, and with a virtually collapsed economy. These contrasting factors Characterise most nations in the SADC and sub-Sahara Africa regions, hence they provide an ideal scenario since the inquiry seeks to develop an e-government adoption and utilisation conceptual model pertinent to such setups. Thirdly, Zimbabwe is the researcher's country of origin, with one parent having migrated from Zambia; he is well versed in the major languages spoken in these countries. Therefore, this is an added advantage to the researcher to overcome language barriers during data collection. Fourthly, the researcher selected these two countries due to their accessibility, allowability and feasibility of data gathering processes within the specified timeframe of the study. Whilst these may not be the most plausible yardsticks for study justification, they, however, provide the researcher with some basis of assessment of the utilisation of e-government in the two nations.

4.1.4.4 Deciding on the Sampling Frame

Before defining a sampling frame for the study all the sample components of the population should be clearly defined (Sapsford & Jupp, 2006). Central to this are the sampling elements and sampling units of the enquiry. Sampling elements also referred to as 'elementary units,' are specific participants from a population whose features are investigated, (Molenberghs, 2010). In this study, the sampling elements are individual citizens, aged above 18 years who reside in Lusaka and Harare, and access government services - either by using e-services or going in person to government offices to access the services over-the-counter. On the other hand, sampling units define a collection of non-overlapping and exhaustive elements of the

population, (Sapsford & Jupp, 2006). In both countries under study, the adult age is 18 years and constitute the population above restrictions to accessing certain services like government loan application.

According to Kulshreshtha (2013), studies which adopt a multi-stage sampling plan should inevitably use multi-stage sampling units. This enquiry, therefore, uses both geographical regions of each city and citizens (with ages above 18 years) as sampling units; since the researcher samples from both. In the first phase of sampling, geographical regions are selected, thus they are the major sampling units. The citizens are secondary sampling units (in this instance, they are also the elements for the enquiry because their behaviour with regards to e-government utilisation is being measured).

The sampling frame constitutes the entire list of members of the population under inquiry, (Omair, 2014:143). According to Collis and Hussey (2009:209), a sampling frame is a "record of the population from which a sample can be drawn". Since the enquiry targets users and non-users of e-government services, the original target sampling frame was the list of residence from local municipality boards. However, for security and confidentiality reasons, this information could not be obtained; leading to the enquiry relying entirely on ZIMSTATS (2012b) report, United Nations Development Programme Report (2013), ZAMSTATS (2011) and reputable online statistics on population information. Further, the researcher encountered non-disclosure challenges when soliciting for recent household-related information from most municipalities within Harare and Lusaka provinces.

4.1.4.5 Choosing the Sampling Methods

Collecting data for the study from the entire population is virtually impossible due to time and economic constraints (Onwuegbuzie & Collins, 2007). Therefore, collecting data from a sample of the population becomes a sensible approach. The sampling technique adopted for this study was guided by three major aspects: the nature of the enquiry, objectives of the enquiry; and time-frames and budget-constraints (Hair et al., 2011). Basically, there are four broad categories of sampling strategies for use in gathering data for an enquiry: probability, purposive, convenience and the mixed methods strategies. Figure 4.3 outlines the taxonomy of each of these four major sampling techniques.

Probability sampling techniques seek representatives of the sampling elements of the population and are predominantly associated with survey-based enquiries, (Teddlie & Yu, 2007). Probability sampling techniques are predominantly associated with quantitative enquiries that encompass choosing comparatively large elements from the strata of a population in a random fashion with every member having an equal and non-zero probability of being selected for the study (Tashakkori & Teddlie, 2003a). The prime goal of using probability sampling technique is to achieve representativeness of the entire population. The researcher used a combination of stratified and random sampling techniques as part of multilevel mixed methods sampling since they accommodate representativeness amongst citizens along gender and age-basis as called for by the enquiry. Stratified sampling has the advantage of reducing the overall sampling error – hence its adoption for this study. However, other moderators like educational level, occupation and internet-use experience that had an influence on citizens' behaviour to adopt and utilise e-government services were addressed by the purposive sampling strand.

Purposive sampling is that kind of sampling in which individual elements of the population are intentionally nominated for inclusion in the inquiry due to possession of essential information which could not be obtained from other options (Maxwell, 1997). The purposive sampling method is predominantly used in qualitative enquiries to select sampling elements (units) guided by explicit purposes pertinent to answering research questions for the enquiry. This enquiry uses 'sampling to achieve representativeness/comparability' purposive sampling strategy. According to Teddlie and Yu (2007), the technique should be used when the researcher seeks to achieve two major goals: selecting a sample that characterises a wider collection of cases with accuracy and setup comparisons amongst diverse categories of cases. There are basically six different types of 'sampling to achieve representativeness/comparability' sampling technique: explicitly typical case, extreme or deviant case sampling (also known as outlier sampling), intensity, maximum variation, homogeneous and reputational case (Teddlie & Yu, 2007). Of these six, this enquiry uses the intensity purposive sampling technique, which calls for systematic intense follow-up on the same respondents who should have participated in the first phase of qualitative data gathering. Such outliers of successes or failures produce indispensable information regarding e-government utilisation and non-utilisation by citizens. Furthermore, such deviant cases provide remarkable divergence across cases, in so doing sanctioning comparability across the cases.

Purposive sampling shall be used to select eight participants for interviews, taking into consideration factors like gender and whether they have used e-government systems or not.

Convenience (opportunistic) sampling encompasses drawing samples from the easily accessible population that is prepared to participate in the enquiry without financial gains (Farrokhi & Mahmoudi-Hamidabad, 2012). There are basically two broad categories of convenience sampling: captive and volunteer samples. However, this option was not considered for use in this study because it lacks expert judgment and rationale for selecting participants for the study – thus its pitfall is lack of sample representative of elements (Battanglia, 2011). Moreover, according to Robinson (2014), the major drawback of convenience sampling is in restricting the generalisation of results to the local context, as opposed to decontextualise abstract assertions.

The fourth type of sampling technique is mixed methods and has five different types as indicated in Figure 4.4. This technique encompasses "selection of units or cases for a research study using both probability sampling (to increase external validity) and purposive sampling strategies (to increase transferability)" (Teddlie & Yu, 2007:78). The overall justification for using a mixed methods technique hinges on the need to draw sample sizes that adequately address the research questions for the enquiry; focusing both on depth and breadth of information regarding e-government utilisation across the probability and purposive research strands. This enquiry adopts the explanatory sequential strand of the mixed methods design. This technique allows the researcher to do methods triangulation from the discrete quantitative and qualitative strands of the enquiry, thus sanctioning room for confirming, cross-validating, and or substantiating findings in a single inquiry (Creswell et al., 2003). As illustrated in Figure 4-4 and explained above, this study uses random and stratified probability sampling techniques to sample the geographical zones in Harare and Lusaka and test hypotheses (established in Chapter 3) regarding citizens' characteristics, challenges and trends in e-government utilisation. The extreme case sampling strand of the purposive sampling technique is being used to identify extreme cases of e-government utilisation and non-utilisation amongst the target population to achieve confirmatory of the quantitative and qualitative findings. The rich data generated from this strand regarding citizens' trends in e-government adoption and utilisation forms the basis for answering the research question: 'What measures should be put in place to enhance the adoption and uptake of e-government initiatives for the benefits of citizens in developing countries?'

The literature on the use of mixed modes in sampling and data collection (Creswell et al., 2011; Creswell, 2009; Harris & Brown, 2010; Meschede & Chagante, 2015; Hsu & Brooke, 2015) has shown its capability to increase response rate and coverage.

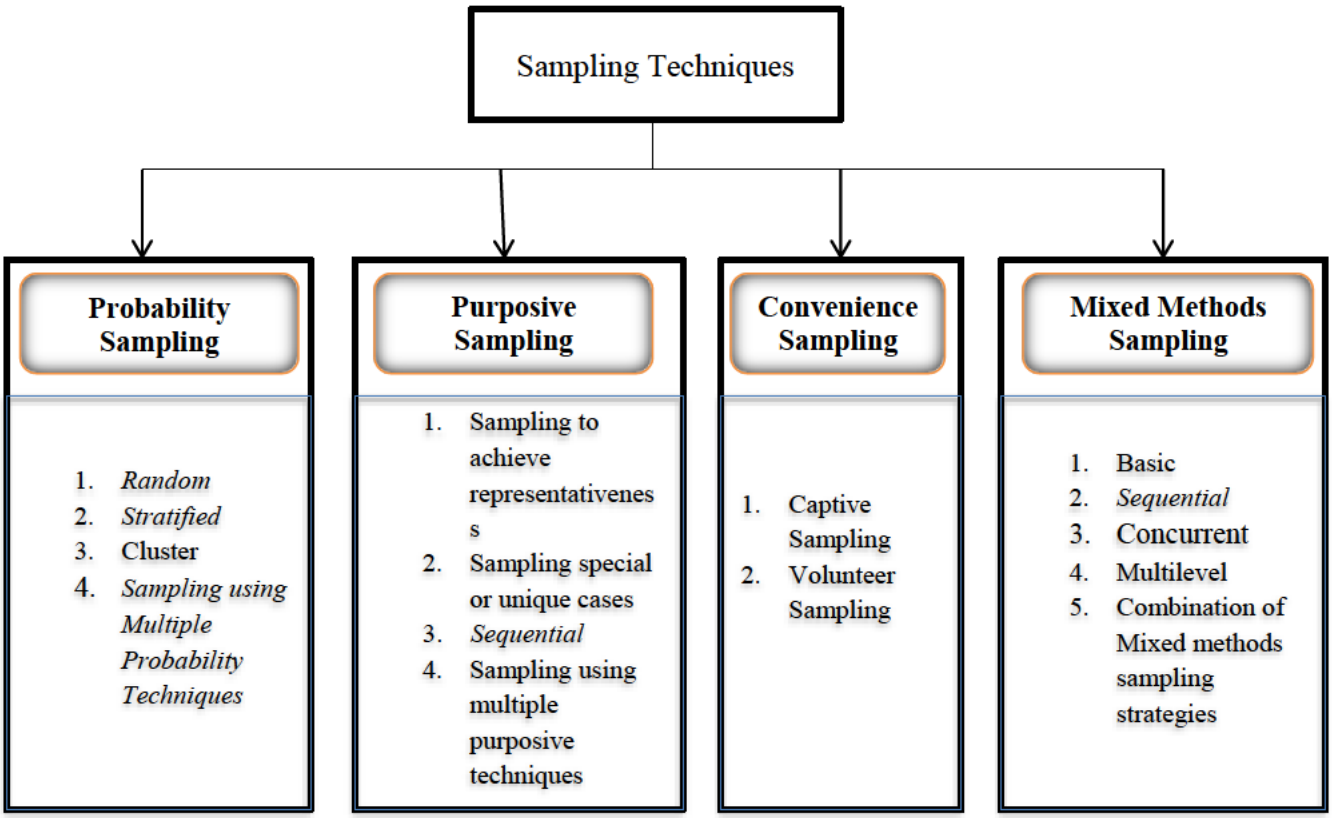


Figure 4- 4: Taxonomy of Sampling Techniques

4.1.4.6 Deciding on the Sample-Size

The decision on the right sample size for any study should be determined by the type of research questions, sampling method and sampling frame adopted (Onwuegbuzie & Leech, 2006; Small, 2011). Therefore, sample sizes for this enquiry are determined along the quantitative and qualitative strands separately as outlined:

a) Sampling for Quantitative Strand:

1. The target population for the study are individual adult-citizens aged above 18 years (the population that demands e-government services)
2. Cochran (1977) and Israel (2009) recommend that for large population sizes (i.e. $N \geq 10\,000$), Equation 1 should be used to determine the sample size:

$$n = \frac{[z^2 * p(1-p)]}{d^2}$$ Equation 1

Where,

'N' represents the desired sample size; 'z' is the level of risk one is willing to accept (confidence level); 'p' denotes the proportion in the target population estimated to have characteristics being measured and 'd' is the level of statistical significance set (margin of error).

3. Sample size to be used is 400 for each city (and 800 for the entire study**)**; (calculated at 95% confidence level (z = 1.96), 50% estimated the prevalence of adult population and at a 5% margin of error).
4. **First Stage**: purposive sampling was used in selecting the target cities to study in the two countries.
5. **Second Stage**: identifying the number of geographical regions in each city (strata), based on ZIMSTATS (2012b) and ZAMSTATS (2011, 2013) reports. The sampling unit for the study is geographical regions of the cities (this shall give a non-overlapping and exhaustive picture of the target population). The relative proportion of participants in each geographical region of each city is reflected in the sample using a proportionate sampling technique calculated using Equation 2, (Charan & Biswas, 2013):

$$n_i = \frac{g_i}{N} * n$$ Equation 2

Where,

n_i = proportionate sample size for each stratum.

g_i = size of the i^{th} region; where, i = 1,…,k; and k is the number of city regions.

n = overall sample size

N = total target population for the city

Table 4- 6: Relative proportionate sample sizes per strata (Harare)

City Region (strata)	Estimated Population (above 18 years)	Proportion of Population (%)	Proportionate Sample size/strata (using Equation 2)	Representation of male-to-female participants (proportionate to regional population)			
				Male		Female	
				%ge	Actual Number	%ge	Actual Number
Harare Rural	62 160	5	**20**	49.7	**10**	50.3	**10**
Harare Urban	870 245	70	**280**	48.2	**135**	51.8	**145**
Chitungwiza	211 345	17	**68**	47.2	**32**	52.8	**36**
Epworth	99 457	8	**32**	50.2	**16**	49.8	**16**
Total	**1 243 207**	**100**	**400**	-	**193**	-	**207**

Table 4- 7: Relative proportionate sample size per strata (Lusaka)

City Region (strata)	Estimated Population (above 18 years)	Proportion of Population (%)	Proportionate Sample size/strata (using Equation 2)	Representation of male-to-female participants (proportionate to regional population)			
				Male		Female	
				%ge	Actual Number	%ge	Actual Number
Chongwe	91349	8	**32**	50.7	**16**	49.3	**16**
Kafue	113662	10	**40**	50.9	**20**	49.1	**20**
Luangwa	11100	1	**4**	48.3	**2**	51.7	**2**
Lusaka Central	934642	81	**324**	50.1	**162**	49.9	**162**
Total	**1 150753**	**100**	**400**	-	**200**	-	**200**

6. **Third Stage**: for each of the geographical regions identified, the relative weights of each stratum (along gender-lines) was calculated and reflected in the sample (Table 4-6 and 4-7). However, obtaining further information on the subdivision of city regions into local municipalities were futile since the ZIMSTATS (2012b) and ZAMSTATS (2011, 2013) reports excluded such information and the researcher cited non-co-operation from the local municipality administrators contacted, fearing confidentiality issues.
7. **Fourth Stage**: Targeting of respondents from each stratum was done conveniently at various public areas like shops, offices, residential areas and markets. The sampling frame is every person aged above 18 and resides in the identified geographical city regions.

b) Sampling for Qualitative Strand:

Purposive Sampling Technique used to

- Identify citizens who have used and those who have never used e-government systems – gender issue under consideration.
- 8 participants were selected for interviews, one from each of the identified city regions of Harare and Lusaka. The researcher's expert knowledge was used to select the participants. Furthermore, the selection was based on tracing those participants who had participated in the quantitative data collection; since the purpose of the qualitative inquiry is to provide more insights into quantitative results.

4.1.4.7 Sample-Size Considerations

Literature regarding the suitable sample sizes for mixed methods research (Van Voorhis & Morgan, 2007; Onwuegbuzie & Collins, 2007; Venkatesh et al., 2013; Collins, Onwuegbuzie & Jiao, 2007) encourages dichotomisation – with the quantitative strand being associated with large sample sizes and qualitative with smaller samples. The larger the size of participants for the quantitative strand of enquiry the greater the statistical power returned and likewise, approximation error decreases.

Moreover, the literature suggests that larger sample sizes are a better representation of the population (AlKhatib, 2013; Collis & Hussey, 2009:2010) and provide a better ground for generalising the findings. A sample of 800 participants for a 5% level of precision is considered large enough for the study, given the recommended 400 for a large population size ($n \geq 100\ 000$), (Delice, 2010; Hair, 2010; Israel, 2009)).

A sample size of 8 participants for interviews for the qualitative strand of the explanatory sequential mixed methods design should provide in-depth, rich insights and a follow-up of the quantitative results regarding citizens' perceptions, adoption and utilisation of e-government services. Marshall et al., (2013:11), suggest that "there are no published guidelines or tests of adequacy for estimating the sample size required to reach saturation," in a qualitative research. Regardless of this, Marshall cautions researchers for justifying the use of small samples that generate little data, leading to inadequate and untrustworthy enquiries. Likewise, Patton (2002:242) points out:

> "There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry, what's at stake, what will be useful, what will have credibility, and what can be done with available time and resources."

Given the background that qualitative data to be collected from interviewing of 8 participants is intended to give a second opinion on the convergence and or divergence of qualitative and quantitative findings – the 8 interviews to be held are justifiable. Additionally, the use of a large number of participants leads to the exponential growth of data, which constrains budgeted time and financial resources.

4.1.4.8 Statistical Analysis

Statistical data generated from the quantitative strand of the mixed methods approach for the case study was analysed to identify significant relationships between variables. This is a causality inquiry; pursued to discern the 'cause-effect' relationship for the variables established in the questionnaire and hypotheses set in Chapter 3. The statistical analysis is decisively aimed at establishing the profile of citizens using e-government amenities, and factors underlying their decisions (especially for using and not utilising the services).

Statistical analysis assists in testing the established hypotheses and determines whether they are worthwhile (supported) for inclusion (using Structural Equation Modelling) into the final

e-government adoption and utilisation conceptual model. For instance, the study will seek to establish if there is any correlation between participant's age and their habits in internet use; any correlation between their education levels with a propensity to use internet and e-government.

To achieve the statistical analysis goal, the following statistical methods and models were used:

1. *Grouped Frequency Distribution* - involves organising of the frequency distribution of raw-data between variables (age, education with other dependent variables like internet use, willingness to use e-government services and ease to use e-government systems) into various categories of graphs and tables for better data display, interpretation and for easier comparison of different datasets.
2. *Pearson's Correlation Coefficient* (r) – The correlation coefficient measures the magnitude of the association between two or many quantitative variables under investigation. For instance, a correlation coefficient analysis can be performed to assess the association between 'citizen's education level and internet use'; and 'e-government awareness and actual utilisation'. The values of the correlation coefficient (r) lie between -1 and +1 always. A positive (+1) correlation coefficient shows that the variables are "perfectly related in a positive linear sense," a negative (-1) correlation coefficient depicts a negative association of variables in a linear-sense; and a correlation coefficient of 0 shows no linear relationship (the University of West of England Bristol, 2015).
3. *Pearson's Chi-Square Test (χ^2)* – the basic chi-square test of goodness-of-fit is often used when the inquiry has nominal variables (discrete categories) and the researcher wants to understand "whether the number of observations in each category fits a theoretical expectation" (McDonald, 2009:108). In this enquiry, the χ^2 tests are used to further scrutinise some relationships between low significance results that could not be adequately established using the logistic regression model. This justifies its relevance to this study. For instance, the nominal variable of gender (Question 1 in the survey) and nationality (Question 4 in the survey) and actual utilisation (Question 24 in the survey). The significance level is set at 5% (0.05).

   Nevertheless, the (χ^2) requires large sample sizes to yield correct values, and this is adequately covered by this inquiry (where N = 800).
4. *Phi and Cramer's V Tests* were used to establish the strengths of association between independent variables and were carried out after the Chi-square test for significance.

5. *Factor Analysis (FA)* - the study shall use Exploratory Factor Analysis (EFA) to re-confirm the reliability and validity of the multivariate variables of the questionnaire at the 0.05 level of significance. The EFA will assist in discovering "complex patterns by exploring the dataset" and hypotheses-testing (Yong & Pearce, 2013:79). In addition, FA shall be carried out for the following reasons: to ascertain a subset of variables with some effects on e-government utilisation amongst citizens that should be considered for subsequent analysis and inclusion into the final e-government utilisation conceptual model, and to refine the initial e-government utilisation model proposed in Chapter 3 based upon findings.
6. *Cronbach's Alpha Test of Reliability* – was used to achieve internal consistency reliability (ICR) analysis for the construct variables of the questionnaire used to collect data for this study. ICR analysis is a measure that estimates the internal consistency of scores derived from construct variables. This study adopts a 0.70 minimum recommended Cronbach's Alpha score (Hair et al., 2014).
7. *Kaiser-Meyer-Olkin (KMO) Test for sampling adequacy* – was used for scrutinising and establishing the sampling adequacy of the study (Yong & Pearce, 2013). This study adopts the minimum recommended KMO value of 0.50 (Yong & Pearce, 2013) for all its construct variables evaluation.
8. *Bartlett's test of sphericity* was used in this study to further confirm the existence of patterned relationships by establishing the factorability of the output matrix within and amongst construct variables. In this study, Bartlett's Test of Sphericity has used two measures of assessment: Pearson's Chi-Square Test (χ^2) and significance values at ($p < 0.05$) to confirm if a constructed variable is suitable for factor loading.
9. *Multiple Regression Analysis* was used to establish the effect of predictor variables on the dependent variables (e-government use behaviour and behavioural intention to use e-government). To determine how well the proposed model (PDEGAUM) fits the collected data, several analysis were carried out: the incremental fit measure utilising the *R*-Square (R^2) model; ANOVA test and the coefficients of independent variables utilising the Beta (β) values of the loaded construct variables and their associated *F*-ratio, *t*-values, significant values, *tolerance* and *variance inflation factors* (VIF) to detect the absence of multicollinearity and significance of construct variables in explaining the two dependent variables. (Steps 1-9 were achieved using the IBM-SPSS version 23).

10. *Structural Equation Modelling* (SEM) was used to measure the overall model fit using several standards and indices like goodness-of-fit index (GFI), normed-fit index (NFI), adjusted-goodness-of-fit index (AGFI), index of fit (IFI), Tucker-Lewis index (TLI), comparative fit index (CFI) and root-mean-square-error of approximation (RMSEA). Moreover, Confirmatory Factor Analysis (CFA) was also used for testing the discriminant and convergent validity of the measurement scales. (Achieved using the IBM AMOS version 24).

4.1.5 Considerations for Ethical Issues

Ethical considerations constitute the foundation for conducting a meaningful and credible qualitative and quantitative research study. Similarly, mixed methods research should discuss the combined ethical issues pertaining to the qualitative and quantitative strands commencing at the research proposal writing phase through data collection phase to the conclusion (Creswell, 2008, 2012). According to Best and Kahn (2006), the "ethical behaviour of individual researchers is under unprecedented scrutiny," and as such, it is unacceptable to undertake any research without adequately addressing ethical issues concerning that study.

According to Nydal (2015), ethical deliberations of a scholar are an emblem of integrity in the academic world. To guard against any potential ethical and legal implications of negligence, arising from the inquiry, the researcher's planned activities (including the research proposal, data gathering processes and instruments, analysis and write-up) went through the University of KwaZulu-Natal Ethics Committee for scrutiny and approval. After extensive scrutiny of the instruments and planned action, and several iterative amendments – the committee was convinced that the rights and safety of the study participants were met and an ethical clearance letter was issued.

The researcher will select participants for the enquiry based on laid down sampling criteria, under the auspices of pure academic intentions and will be informed, prior to participation that their rights to privacy, anonymity and confidentiality are fully guaranteed throughout the study and a written consent will be obtained. In this regard, consent forms for both interviews and questionnaire participants were designed, critiqued and approved by the UKZN Ethics Committee. Every participant will be asked to sign it before taking part in the study. These

consent letters have contact details (names, e-mails and phone numbers) of both the supervisor and researcher; just-in-case participants have any ethical concerns to report (see Appendix 6).

In addition, all participants were informed about the goal of the study as being purely academic, aiming to find solutions on how governments can improve e-government service utilisation by citizens. Furthermore, all participants were informed that their voluntary participation is invaluable to the success of the study, there are no financial gains for their participation, and have rights to withdraw from the study at any time.

The major goal for scrutinising ethical issues prior to undertaking a research is to safeguard all stakeholders involved in the enquiry: the researcher, supervisors, institutions, sponsors and participants "throughout the lifetime of the research and into the dissemination process" (The Economic and Social Research Council, 2015:2). Creswell (2008) argues that ethical considerations should span the entire spectrum of the research enquiry: commencing at the research proposal, through intermediate sections of design, data gathering, analysis and interpretation, write-up and dissemination. The potential impact of this study on research participants is that it put at risk those participants who work in government offices and handle sensitive information and are bounded by non-disclosure agreements. The study sought to address this aspect by issuing concent letters that ensure that all participants have a discretion on what information should be provided and also to guarantee them anonymity for all data provided. Moreover, the researcher shall reference and cite all scholarly work with accuracy and honesty.

4.2 Research Methods

Research methods outline all the necessary methods and techniques required for data gathering and its subsequent analysis to answer the research questions. Kothari (2004) subdivides the research methods into three major classes. The first class consists of all the methods concerned with empirical data collection. The second category comprises techniques (both statistical and non-technical) used for data analysis to establish empirical findings.

The third category is made-up of all the methods used for assessing the correctness of data findings and procedures used for collecting and analysing that data. According to Venkatesh, Brown and Bala (2013), the third type is referred to as research methods quality and rigour controls. The next three sections describe these three subsections of the research methods, pertinent to this enquiry.

4.2.1 Data Collection and Instruments

Data collection is defined by Burns and Grove (1999:43) as "the accurate and systematic gathering of information relevant to the specific objectives and questions of a study." The case study approach depends on numerous sources of evidence (Yin, 1994:13). This provides an opportunity for exploring results in more detail, which strengthens the case study research design through follow-ups on quantitative information from the quantitative data analysis (Yin, 1994). Case study design should combine multiple data collection techniques for the purpose of strengthening the study (Darke et al., 1998; Yin, 2009) and for obtaining a rich-data-set about an investigated phenomenon (Benbasat, Goldstein & Meliss, 1987). These consist of interviews, documentation, direct-observations, questionnaires, interviews, archival-records and physical-artefacts. The major data collection techniques most suitable and used in this study are questionnaires and semi-structured interviews.

4.2.1.1 Questionnaires

The researcher used questionnaires to collect quantitative data first that are related to the study. According to Castellan (2010:2) questionnaires comprises the same set of questions that are uniformly asked all participants. Semi-structured questionnaires were designed in-line with the research questions and objectives of the study. The questionnaire has four sections: Section A, soliciting for demographic details of the participants; Section B, asks for the user's experience in using computers and the Internet; Section C, asks for citizen's access to and use of e-government systems; Section D, soliciting for views from citizens regarding factors that were impeding their intentions and capacity to use the internet and e-government systems. Sections A to C of the questionnaire are closed-ended questions whilst Section D has a mixture of closed-ended and open-ended questions.

A multi-section questionnaire was designed to solicit for information from the targeted population because the study focuses on gaining an insight into the utility levels of e-government systems by citizens and an understanding of the government processes and initiatives on promoting e-government adoption by citizens. According to Burke and Larry (2008), researchers use questionnaires because they are a cheap and faster method of data collection from a large population. Furthermore, data collected using questionnaires can be easily consolidated for detailed quantitative analysis; hence their use as tools for data collection.

However, questionnaires have their shortcomings. There is the possibility of poor returns rate and receiving back partially completed questionnaires from participants due to failure by certain sectors of participants to comprehend certain questions. To address these shortfalls, the researcher administered the questionnaires in person and encouraged participants to complete the entire questionnaire and use clear and simple English that can be easily understood by the target participants. Where necessary, the researcher provided clarification, translations and complete the questionnaire on behalf of the participants based on their experience with internet and e-government. According to Creswell (2005), it is noted that data collected using questionnaires is susceptible to distortion due to undesirable collaborative responses among participants. The researcher curbed this pitfall by encouraging all participants to complete the questionnaires individually. This ensured true and reliable responses that guaranteed valid and reliable results. Refer to Appendix 2 for the research questionnaire.

4.2.1.2 Interviewing

The research study also uses interviews to solicit information from citizens regarding their utilisation of e-government services. According to Yin (1994), interviews constitute an indispensable source of primary data for case study research, (Darke et al., 1988). Through interviews, the researcher shall explore in-depth insights regarding participants' attitudes, views, actions and interpretations of their personal experiences (Harris & Brown, 2010; Kendall, 2008) in using e-government systems. According to Creswell (2007), there are three forms of interview design that the researcher can choose from in order to obtain thick-rich data and these are informal-conversational, guide-approach and open-ended interviews. These three approaches can be conducted using either face-to-face interaction with individual or group

participants and through telephonic interviews (Yin, 2009). Furthermore, Yin provided guidelines to researchers as to when to use interviews for a case study:

- When the goal is to acquire further in-depth confirmation about participants' perceptions, experiences, insights, attitudes and opinions on the subject of inquiry.
- When establishing differences amongst participants' personal experiences and effects.
- When the researcher wants to make a follow-up to other data gathering methods, often cementing further explanations to quantitative data.

Planning for the interview is very important in order to obtain trustworthy findings (Guba & Lincoln, 1989). Notes and recordings shall be utilised for capturing interviewees' input – after seeking for their informed consent. Recordings shall be transcribed for consolidation and analysis. In keeping in-line with Yin's (1994) suggestion for doing method triangulation in case studies, interview data provided further clarification (confirmatory) to results obtained using questionnaires. Semi-structured interviews were used in this study since they provided further insights to assist in verifying and validating information obtained using questionnaires on factors affecting citizens' utilisation of e-government systems. The findings assisted in the formulation of the people-driven e-government adoption and utilisation model.

The researcher conducted all the eight interviews in person. Prior to conducting the interviews, all interviewees were identified from the group of people who had previously participated in the quantitative survey. All respondents were initially contacted in person and then via either telephone or emails, providing them with general background information to the study and the questions. This was then followed by issuing of cover letters (see Appendix 6) just before commencing the interview which outlines the background of the researcher and the aim of the inquiry. All the participants were asked to sign an 'informed consent letter' obtained from the UKZN Ethics Committee that gave an assurance and guarantee to all interviewees regarding the confidentiality of their information and anonymity of participation.

Eight participants were interviewed for the study, one interviewee from each of the eight identified city regions of Lusaka and Harare. Table 4-8 outlines the specific criteria used for the interview. The themes of the interview were informed by the quantitative findings, focusing more on users' perceptions, awareness of and experiences in using e-government systems. By conducting interviews, the researcher sought to gain a deeper understanding of and a

confirmatory perspective of the factor established in the quantitative results as affecting citizens' adoption and utilisation of e-government systems in Zimbabwe and Zambia. Refer to Appendix 3 and 4 for a complete set of semi-structured interview questions.

Table 4- 8: Criteria for the interview participation selection

Key Variable	**Criteria**
Sampling Technique	Purposive
Age range	18 years and above
Number of participants	8 (1 person/city region)
Composition of participants	4 participants who have used and 4 who have not used e-government system
Time Allocation for each interviewee	45 minutes to 1 hour using the face-to-face interview

4.2.2 Data Analysis

Data analysis is the process of bringing order, structure and meaning to the mass of collected data for its interpretive and meaningful quality (Marshall & Rossman, 1999; Ramara et al., 2010). The use of both qualitative and quantitative approaches in this study results in overwhelming volumes of collected data, specifically through interviews and questionnaires. Therefore, to minimise the chances of being overwhelmed with volumes of data in the data analysis phase, the researcher analysed data in batches as it was collected. This is in line with Merriam (1998) who suggests that the best way to analyse research data is to carry it out concurrently with data gathering.

To analyse data collected through qualitative approach (mainly interviews); the researcher used Nvivo software (for the first-Level Classification), then through thematic analysis for subsequent stages (Onwuegbuzie & Combs, 2011). The themes were derived from dependent variables of the quantitative strand (behavioural intention and use behaviour) and the associated construct variables. Based on the identified themes, data collected were analysed, presented as

further insights to explain the quantitative results findings. The collected qualitative data were not quantified by "enumerating the frequency of themes within a sample, the percentage of themes associated with a given category of respondent, or by the percentage of people selecting specific themes" for triangulation purposes, (Driscoll et al., 2007:24; Onwuegbuzie & Teddlie, 2003). To avoid a situation where the results are diluted due to quantification, the researcher presents the qualitative results in their original synthesised thematic state. This is in line with Hancock et al., (2007) who states that human behaviour under study using case studies cannot be easily quantified if the researcher wants to return the full-strength meaning of a particular study. The researcher provided a rich description of research findings to enable readers to assess if the identified critical factors affecting e-government utilisation in Zambia and Zimbabwe can also be regarded as critical factors affecting citizens' decisions to utilise similar services in other developing countries.

Data collected using questionnaires will be analysed quantitatively. According to Sekaran and Bougie (2010), it is crucial that the collected data is precise, thorough and appropriate for subsequent analysis. In line with this notion of accuracy in data analysis, Khalid et al., (2012) emphasise the importance of selecting the most appropriate statistical-technique or econometrics-model that best answers the research problem to answer the research questions. For the quantitative data analysis, the researcher used the Statistical Package for Social Sciences (SPSS). The researcher used "descriptive statistics concepts to explain data such as frequency distributions or cumulative frequency distributions, histograms, various types of charts like bar charts & pie charts, scatter diagrams, box plots etc." (Khalid et al., 2012:26; Lind et al., 2008). Further, mathematical analysis for correlation of dichotomous and discrete variables using multiple regression models and chi-squared goodness of fit were used and has already been explained above. The adoption of SPSS for the analysis of case data was based on its successful implementation on contemporary studies on e-government adoption (Meftah, Gharleghi &Samadi, 2015; Zhao, Collier & Deng, 2014; Paura & Arhipova, 2012; Jones, 2007).

4.2.3 Validation for the Study

Validation forms the bases of social science researchers and symbolises the quality and rigour aspects of the research (Shadish, Cook & Campbell, 2002). Venkatesh et al., (2013:31)

recommends that the "quantitative and qualitative strands in a mixed methods design" should be subjected to their respective validation principles. See Table 4-9 for a detailed outline of the different types of validity relevant to quantitative research methods and those for qualitative methods (see Table 4-10). According to Joppe (2000:1) reliability is the degree to which a research instrument can achieve the same results using the same methodology over different circumstances. Thus, the key aspects of repeatability and consistency should be maintained and obtained when administering repeatedly questionnaires to the target population for the study. The researcher designed data collection instruments in such a way that they are stable – meaning that when the researcher deploys (test-and-retest) the questionnaires in all two countries, the results revealed similarities. It is the duty of the researcher to ensure high consistency and accuracy in all administered test scores for the study since participants may be subjected to various personal circumstances. Straub et al., (2004) emphasise that reliability constitutes the cornerstone of a quantitative study and that without it, a study is considered invalid.

On the other hand, validity "determines whether the research truly measures that which it was intended to measure or how truthful the research results are" Joppe (2000:2). Validity, therefore, seeks to address the legitimacy of the findings of the research study. Shadish et al., (2002:127) outline three broad categories of validity that should be addressed in any quantitative research: "(1) measurement validity (e.g., content and construct validity); (2) design validity (i.e., internal and external validity); and (3) inferential validity (i.e., statistical conclusion validity)." Shadish et al., (2002) define internal validity as "the extent of approximate truth about inferences regarding cause-effect or causal relationships in a scientific inquiry." In this study, internal validity was addressed by designing a set of questionnaires that adequately solicit the root causes of participants' decisions for opting to use or not to use e-government services.

Table 4- 9: Types of Validity in Quantitative Methods and Qualitative

Quantitative Methods	
Design Validity	• *Internal validity:* The validity of inferences about whether the observed covariation between independent and dependent variables reflect a causal relationship (e.g., the ability to rule out alternative explanations). To be analysed using multiple regression analysis and Chi-Squared tests for the established hypotheses.
	• *External validity:* The validity of the inference about whether the cause-effect relationship holds over variation in persons, settings, treatment variables, and measurement variables. (Tested over the two case study settings of Harare and Lusaka)
Measurement Validity	• *Reliability:* The term reliability means repeatability or consistency. A measure is considered to be reliable if it produces the same result over and over again. There are various types of reliability, such as inter-rater or inter-observer reliability, test-retest reliability, parallel-forms reliability, and internal consistency reliability. (This is usually achieved through conducting pilot studies. However, in this study, it is achieved through the use of tried and tested questionnaires from the UN e-Government Survey database. *(continues)* • *Construct validity:* The degree to which inferences can legitimately be made from the operationalizations in a study to the theoretical constructs on which those operationalizations are based. There are many different types of construct validity, such as face, content, criterion-related, predictive, concurrent, convergent, discriminant, and factorial. (This study used Exploratory and Confirmatory Factor Analysis (EFA and CFA) to establish the validity of construct variables)
Inferential Validity	• *Statistical conclusion validity:* The validity of inferences about the correlation (covariation) between independent and dependent variables. (To achieve this, the inquiry used multiple regression models, Chi-Squared tests and Structural Equation Modelling).

External validity measures the extent to which the results of a study can be generalised. The researcher addressed this aspect by coming up with a generic and holistic e-government adoption and utilisation conceptual model that could be used by any governmental department, policy and decision makers in developing countries to promote the utilisation of e-government projects. In addition, validity and reliability were achieved through the use and customisation of research questionnaires used by the United Nation e-Government Surveys (2012, 2014), thus rendering preliminary pilot studies irrelevant. Other mechanisms used to achieve this included the use of multiple sources of evidence for the purpose of methods triangulation as opposed to data triangulation. According to Johnson et al., (2007) triangulation involves combining multiple methods of data collection in a single study to gain in-depth knowledge of a phenomenon. Abdalla (2012) claims that a case study research design is rigorous because they combine multiple data collection methods. The researcher used secondary data, interviews and questionnaire methods of data collection to achieve methods triangulation.

Furthermore, the researcher achieved validity by prolonging the process of data collection (Maxwell, 2012) over a period of five months in order to comprehend the environmental dynamics of political, social and economic factors. Changes in these factors have both direct and indirect effects on citizens' decisions to utilise e-government systems in developing countries.

Table 4- 10: Types of Validity in Qualitative Methods

Qualitative Methods	
Design Validity	• *Descriptive validity*: The accuracy of what is reported (e.g., events, objects, behaviours, settings) by researchers. (Rich descriptions of procedures are provided for readers to follow the steps). • *Credibility*: Involves establishing that the results of qualitative research are credible or believable from the perspective of the participants in the research to convincingly rule out alternative explanations. (Researcher used debriefings and explanations of the purpose of the inquiry to participants). • *Transferability*: The degree to which the results of qualitative research can be generalised or transferred to other contexts or settings. (To be achieved through the integration of findings into the PDEGAUM conceptual model proposed).
Analytical Validity	• *Theoretical validity*: The extent to which the theoretical explanation developed fits the data and, therefore, is credible and defensible. (Tested in Chapter 8). • *Dependability*: Emphasizes the need for the researcher to describe the changes that occur in the setting and how these changes affect the way the researcher approached the study. (Chapter 7 address this). *(continues)* • *Consistency*: Emphasizes the process of verifying the steps of qualitative research through examination of such items as raw data, data reduction products, and process notes. (To be achieved in Chapter 7 using various mechanisms) • *Plausibility*: Concerned with determining whether the findings of the study, in the form of description, explanation, or theory, fit the data from which they are derived (Sandelowski, 1986). (To be achieved in Chapter 8 through refining of the initially proposed e-government utilisation conceptual model based on data findings).
Inferential Validity	• *Interpretive validity*: The accuracy of interpreting what is going on in the minds of the participants and the degree to which the participants' views, thoughts, feelings, intentions, and experiences

	are accurately understood by the researcher. (To achieve this, the researcher removed all pre-conceived thoughts regarding participants during data gathering). • *Confirmability*: The degree to which the results could be confirmed or corroborated by others. (Open to other researchers to confirm the procedures and findings of this inquiry).

(Source: Venkatesh et al., 2013:33; Teddlie & Tashakkori, 2003).

4.2.3.1 Qualitative Approach Validity (Trustworthiness)

According to Ridenour and Newman (2008) ensuring validity in qualitative research is ambiguous and contentious. The major reason for this has been cited by Kalof et al., (2008) and Bryman (2012) as the lack of practicality to use validity and reliability per se to assess qualitative research.

Despite this contention behind validity and reliability in qualitative studies, the study adopts four measures of research trustworthiness suggested by Lincoln and Guba (2005) for measuring the quality of a qualitative research, which is credibility, transferability, dependability and confirmability. Qualitative research is regarded as trustworthy when "it accurately represents the experiences of the participants," (Rolfe, 2006; Streubert & Carpenter, 1999:333). On the other hand, Venkatesh et al., (2013:34) classified qualitative validity into two broad types: "rigour in the application of methods (design validity) and rigour in the interpretation of data (analytical and inferential validities)". With regard to validity in the context of mixed methods research, Teddlie and Tashakkori (2009) recommend the use of 'inference quality' to refer to validity and 'data quality' for reliability. Teddlie and Tashakkori's (2009) inference quality and data quality form the basis of this study.

The researcher achieved inference quality through generalisation of empirical results to the large population in the form of "theoretical generalisability" (Eeva-Mari & Lili-Anne, 2011:7). Based upon empirical results, an e-government adoption and utilisation conceptual model was proposed that is applicable to developing countries. In addition to this, the researcher provided a simplified explanation of data gathering and analysis techniques that can be easily understood and transferred to other similar studies and developing countries faced with similar

circumstances. Moreover, the researcher adopted Total Quality Framework (TQF) (Roller & Lavrakas, 2015) as a theoretical lens for executing the qualitative data analysis for this study. According to Roller and Lavrakas (2015), the TQF is rigour and provides a clear path for ensuring trustworthiness for a study, hence its justification for use in this study. Also provided is a 'rich and thick description' of the findings to enable readers to make an informed judgement and derive their own meaning when faced with similar situations – and be able to draw their own conclusions.

4.3 Rationale for the selection of Research Methodology

This section provides a justification for the selection of the research methodology for the study. This serves the purpose of validating and guiding the whole inquiry process.

4.3.1 Pragmatist Research Paradigm

The factors under inquiry for the adoption and utilisation of e-government are shaped by social, cultural, economic and political factors in the context of Zambia, Zimbabwe and the SADC region. Thus, this inquiry is underpinned by a pragmatist research paradigm in which a multi-perspective, dialectical stance and discovery is employed in addressing the research problem and questions; but simultaneously appreciating equally, the objective and subjective understanding (De Lisle, 2011). In this regard, pragmatism provides a philosophical stance that permits paradigm integration and "helps mixed research to peacefully coexist with the philosophies of quantitative and qualitative research" (Johnson et al., 2007:125). Further, given the complexity of views and factors affecting citizens' adoption and utilisation of e-government systems in Zambia and Zimbabwe, a multi-perspective philosophical approach is considered most appropriate to answer the research questions. Furthermore, most mixed methods writers (Caruth, 2013; Creswell, 2003, 2009, 2013; Burke & Larry, 2008; Johnson et al., 2007; Smith, 2011; Tashakkori & Teddlie, 2010) have advocated the use of some version of pragmatism as the most ideal philosophy in the mixed-methods inquiry. For these reasons, the researcher contemplates the pragmatist research paradigm as the most suitable philosophical stance underpinning this research study.

4.3.2 Survey Research Design

The selection of the survey research design is in line with the deductive approach adopted by this study in which theory is spawned from the conceptual model proposed in Chapter 3. Therefore, quantitative data is collected using survey questionnaires from the respondents to test the sixteen hypotheses and establish the model fit (Kenny, 2015; Hooper et al., 2008). Thus, the survey design caters to the quantitative strand of the explanatory sequential mixed methods adopted by this study.

4.3.3 Case Study Research Design

According to Yin (1994), a case study research design is suitable for use when the study seeks a deeper and detailed inquiry about the 'how' and 'why' research questions. Furthermore, Yin (1994) states that a case study is a powerful approach for explaining the inter-relationship between factors and thus suitable for all studies aimed at theory building. The principles for selecting the case study approach for this study were obtained from existing literature and from experts possessing in-depth knowledge of e-government implementation in Zambia and Zimbabwe as outlined below:

- **Track Record of ICT implementation and experiences**: Both countries selected for study have implemented e-government projects of some sort, though at different phases of adoption and maturity. Therefore, each of the selected countries went through the experience of implementing e-government initiatives – thus providing a rich source of data for the inquiry. Furthermore, the wider majority of the citizens use ICT devices in their daily lives for their business or social issues, (ITU, 2013, 2014a, 2014b; United Nations, 2014; World Bank, 2013).
- **Valuable data and information**: the citizens in the selected provinces of Harare and Lusaka were in a better position to provide rich-data and insights into factors affecting their adoption and utilisation of e-government systems. Considering the fact that these two provinces host the capital cities of the two countries and economic hubs, there is sufficient amount of documentary data in various governmental departments and reports on e-strategies, policies and e-government initiatives (Ruhode, 2016; Zim ICT Policy Framework, 2014; ZICTA, 2015; ZMCT, 2006).

- **Accessibility**: access to the countries, cities and citizens had to be considered in line with minimising the costs of data gathering. Firstly, the two countries of Zambia and Zimbabwe were selected based on that they were both in the SADC and were neighbours and thus easily accessible from South Africa by both road and air transport. Secondly, the study focuses on the capital cities of the two countries (Lusaka and Harare), which offered the opportunity for involving both users and non-users of e-government services. This fulfils the aim of the study by getting citizens' views and experiences in e-government utilisation. Lastly, accessibility to the participants for the inquiry was essential. Both Lusaka and Harare are cosmopolitan cities, with the majority of dwellers fluent in the English language; a valuable factor for consideration when gathering data using interviews and questionnaires. The researcher had not to engage any language translators for the study, which sometimes tends to neutralise the original meaning of the gathered data.
- **Population Size of the Provinces:** Both Zambia and Zimbabwe have a comparable estimated population of 15.2 million and 14.6 million (World Population Review, 2014) respectively, widely spread across the countries. Furthermore, the target provinces for the study, Lusaka and Harare had almost identical estimated population sizes of 1.7 million and 1.56 million respectively. The population of the cities represent 11.18% and 10.68% of their countries' total population respectively. This is representative enough to gather the required data on e-government utilisation; especially given the background that the two provinces display both urban and rural setups – Figure 4.5 and Figure 4.6.

Whilst these factors may not be the most plausible yardsticks to justify the selection of the case study and comparisons done, they provided some basis of comparison between the two countries in evaluating the adoption and utilisation of e-government systems by citizens.

4.3.4 Explanatory Sequential Mixed Methods Research Approach

The study adopts an explanatory sequential mixed methods approach. According to Creswell (2013), the choice of the most suitable research approach for a particular study should be based on the type of research questions or problem under investigation. Creswell (2013), further states that the mixed methods approach should be used when the qualitative or quantitative approach

is inadequate to fully understand the research problem. Furthermore, some bias "inherent in any single method could neutralise or cancel the biases of other methods" (Creswell, 2003:15).

The researcher's rationale to select and use the explanatory sequential mixed methods approach is outlined in the next points:

- In this study, research question one and three are answered using secondary data analysis, and question two, three and four are answered using both quantitative and qualitative approaches.

  Therefore, the sequential mixed methods approach is used for method triangulation, as opposed to data triangulation (Fielding, 2012; Tashakkori & Teddlie, 2010; Onwuegbuzie & Teddlie, 2003) – seeking "deeper, multiple, or more complete understanding" of the research problem (Creswell, 2013:32) and explanatory of the quantitative and qualitative approaches.
- The study sought to gather data trends on how citizens were using e-government systems and their individual perspectives regarding e-services. This data was best obtained using a qualitative strand of the mixed methods approach.
- A mixed method approach helps in building a holistic understanding of the research problem against existing gaps in the literature on e-government adoption and utilisation models for developing countries.
- The aim of this research study is to propose a conceptual model for use by policy and decision makers in promoting the uptake and guide the implementation of e-government systems in developing nations. The complexities of factors under inquiry required a more informative approach than a mono-method approach – hence applying the explanatory sequential mixed methods approach assisted in realising the aim of the study. Leslie et al., (2009) argue that the explanatory sequential mixed methods approach is most suitable for understanding complex phenomena requiring some practical interventions.

4.4 Empirical Research Design for the Study

Yin (2003) defines empirical design as action-plan for executing the research methodology of the study from one step to the next, until completion of the enquiry. Figure 4-5 outlines the

major steps used to develop the empirical research design for this study. The various specific works done under each sub-section are explained below. According to Al-Sebie (2005), defining the empirical design roadmap for a study is essential for the reasons that it:

- Ensures the smooth and systematic collection, analysis and presentation of the right data.
- Provide a clear roadmap on how knowledge is derived from the inquiry.
- Provide a step-by-step knowledge-building framework for other researchers (transferability).

Step1: **Research Background Analysis**

This phase involved thorough background investigation of the problem regarding e-government adoption and utilisation in Zambia and Zimbabwe.

The author used existing secondary data sources to gain an in-depth understanding of the whole e-government initiatives in these two nations. The aim of the study is to establish e-government initiatives implemented by the two governments to ease citizens' access to government services. Moreover, the study sought to establish the utilisation levels of e-government services by citizens, paying attention to challenges confronted and assistance rendered by the governments in the uptake of e-services. This preliminary investigation phase assisted in understanding and visualising the whole context of e-government project adoption and hence identifying some critical factors impacting on the utilisation of such systems by citizens. The findings indicated that for both countries, e-government implementation started in mid-2000; but up to now, there is little research to establish the utilisation levels of the services at individual-levels. Further, initial findings revealed a host of challenges faced by citizens, ranging from technological competence and allowance; financial constraints, scanty political will on e-government outreach campaigns and social and cultural barriers. This phase led to the literature review.

Step2: **Literature Review**

This section provides a comprehensive review of literature in the wide-ranging area of e-government and this act as a grounding source of information for most of the research. In this context, it covered background concepts, scope and settings of e-government (covering e-

government at the world, regional and national levels), challenges faced and opportunities created. Since the scope of the research is on the government-to-citizen domain, the literature focused more on the role of e-government services to the general public (citizens and not companies). Specifically, the literature review covers e-government domains, maturity models and new insights and all-inclusive multichannel e-government strategies. Furthermore, the chapter reviews the crucial factors that had a strong effect on the adoption and utilisation of e-government by citizens, such as, social, cultural, economic, political and technological issues. These factors were specifically analysed at different levels; global, regional and national to give a much clearer picture and deeper understanding of their effects on system utilisation. A critique of the literature was given, emphasising the fundamental and empirical study gaps. In addition, the critique drew attention to the inadequateness of information and methodical researches on the evaluation of the uptake of e-government systems by citizens and the impact of e-government services on citizens' lives.

More significantly, the critique sheds light on the lack of relevant guiding models to measure e-government utilisation by citizens for developing nations.

Step3: **Analysis of e-Government Adoption and Utilisation models and frameworks**

The researcher found it essential to review and analyse in detail the existing frameworks and models on e-government adoption and utilisation in order to establish the empirical gap between frameworks. The review of existing frameworks and core indicators for assessing e-government adoption and utilisation provided in-depth insights required for the conception of the initial conceptual model for the study. Further, the critique of existing assessment practices assisted in identifying the research gap, outlining of the conceptual model and hypotheses. The initial conceptual model is based on the e-government core-indicator framework, ITU e-Government Implementation Toolkit Framework and the Unified Theory of Acceptance and Use of Technology as defined in the literature in Chapter 3. The development of the initial conceptual model is a great step towards theory-building and is regarded as an intermediate concept (Weber, 2012) that tries to integrate all the major aspects of the study – research problem, aim of the study, reviewed literature, methodology, data gathering and data analysis. Moreover, development of the initial conceptual model assisted in establishing a vivid understanding and visualisation of the problem, leading to the subsequent painstaking iterative refinement of the conceptual model throughout the study. The ultimate e-government utilisation conceptual model derived from a series of rigorous iterations concluded this phase.

Step4: **Research Methodology for the study**

This phase laid out the foundation for the concepts and methods of this inquiry. This provided a roadmap for the researcher through phases of data collection, analysis and rigour assessment. The researcher adopted a pragmatist research philosophy and employed sequential mixed methods case-study approach.

The design of questionnaires and interview questions was guided by constructs from two conceptual models, the ITU e-Government Implementation Toolkit and the UTAUT Model. In addition, the author took an important decision to adopt for the study, the already tried and tested set of questionnaires by the ITU and UN E-Government Surveys.

This worked as a substitute for a pilot study. Gable (1994) argues that in the absence of an ethical clearance letter to sanction a pilot study at the early stages of the research, the researcher can resort to a tried-and-tested set of questionnaires already implemented in related surveys. Key issues also outlined are on sampling the population for the study and ethical issues that were observed throughout this study. The research methodology stage paved way for the next phase of the inquiry – data gathering.

Step5: **Quantitative Data Gathering and Analysis**

According to Terrell (2012), the type of mixed methods design adopted for an inquiry depends on three indispensable factors: priority of the strategy, the sequence of data collection and the point at which gathered data is integrated for interpretation purpose. For this study, the researcher adopted explanatory sequential mixed methods design. The researcher accomplished this stage of the inquiry by gathering empirical quantitative data first for the two nations under study using questionnaires followed by its analysis using IBM SPSS and AMOS software packages. Once completed, the findings of this stage guided the researcher on the type of questions and specific areas of study that was pursued through interviews to gain an in-depth understanding of the quantitative findings.

Step6: **Qualitative Data Gathering and Analysis**

This stage forms the second phase of the explanatory sequential mixed methods design (qualitative data collection and analysis) for the case study. As indicated earlier on, the purpose of this second phase was to provide further insights (methods triangulation and confirmatory

of the quantitative results as opposed to data triangulation) was achieved through semi-structured interview follow-ups "to help explain survey responses," (Creswell, 2014: 274). The researcher used Nvivo software package for data analysis using the established themes. The qualitative results assisted in further explaining the quantitative results; especially areas like "significant predictors, and significant results relating to variables, insignificant results, or even demographics" (Creswell, 2014: 274). This then led to the discussion of the results and the identification of critical factors affecting the adoption and utilisation of e-government systems in the two countries.

For external validity, the study results (in the form of e-government adoption and utilisation model) should be transferable to assess e-government service adoption and utilisation by other developing countries faced with similar circumstances. Results (both quantitative and qualitative) were discussed leading to the confirmation of valid constructs.

Step7: **Revising the e-Government adoption and utilisation model**

At this stage, the research aim would have been reached through the identification of the critical factors affecting the adoption and utilisation of the e-government services in Zimbabwe and Zambia. This stage clarifies the aim of the inquiry by revising the initial e-government adoption and utilisation conceptual model proposed in step 3 and based on the identified critical factors and several iterative modifications. The researcher regards aspects to do with the testing of the effectiveness of the proposed conceptual model in other SADC countries beyond the scope of this inquiry.

Step8: **Drawing Conclusion, Contributions and Recommendations**

This step signifies the ultimate stage for the empirical research design in which conclusions were drawn and recommendations for future research direction of the study were established. More significantly, this step outlines the contributions of the study in fulfilling the research gap identified in stage one in Figure 4-5.

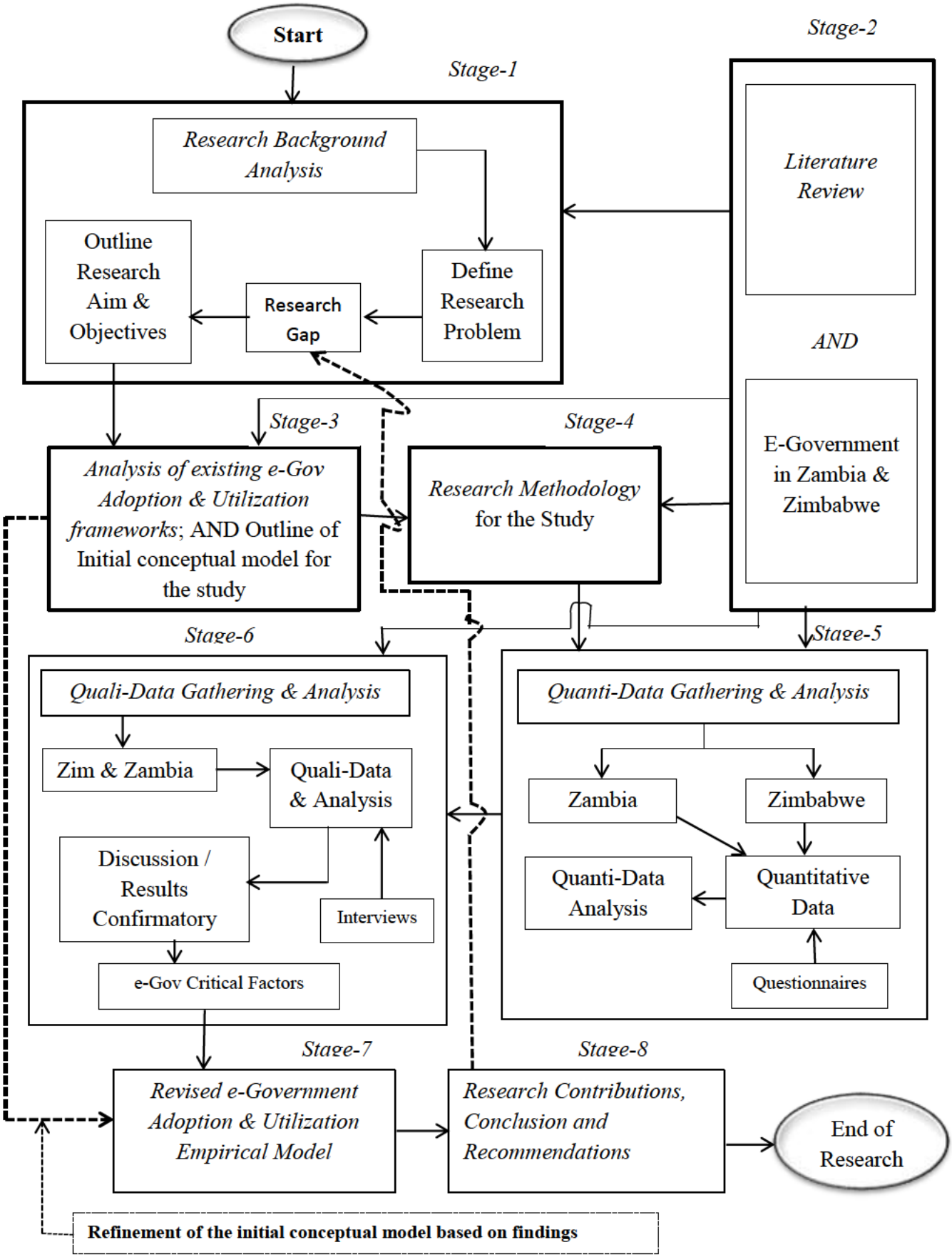


Figure 4- 5: Empirical Research Design Steps for this Study

4.5 Chapter Summary

This chapter outlines the methodology for the inquiry and provides a succinct rationale for adopting the specific research paradigm, approach, strategy and methods. Therefore, to achieve the aim and research objectives for the inquiry, this chapter critiqued the existing philosophical perspectives: positivism, critical-realism, constructivism and pragmatism – and the latter was selected for use in this study based on its merit to answer research questions for this inquiry. Further, the current study sought to understand the socio-technical factors affecting behaviour-intentions to use and the actual utilisation of e-government systems by citizens. Hence, a combination of the 'how,' 'why,' and 'what' research questions pertinent to this inquiry could best be answered using the case study research design, underpinned by the mixed methods research approach. In-depth discussion and consideration for the other research designs (surveys, grounded theory, experimental, ethnography and philosophical) and research approach (qualitative and quantitative) were deliberated upon to reach a decision for the suitability of case study and mixed methods.

The case study approach involving two developing countries from the SADC region were deliberately chosen since the aim of this inquiry was to propose an e-government conceptual model that could be used to promote the utilisation of e-government systems by citizens in developing nations. By covering the two nations (Zambia and Zimbabwe), aspects to do with external validity and trustworthiness of the study and for the proposed e-government conceptual model were catered for. Similarly, the adoption of the mixed methods approach allowed for method triangulation to be done at data gathering and analysis phases. Data gathering instruments, specifically questionnaires and interview questions were designed based on the already piloted set of questions from the ITU and United Nations e-Government Survey databases – hence forgoing the necessity for conducting pilot studies in this inquiry.

The study employed explanatory sequential mixed methods design in data collection and analysis - quantitative data collection and analysis commenced leading to qualitative data collection and analysis. A purposive sampling technique was used to identify participants for the qualitative strand of the mixed methods approach. Likewise, for the quantitative strand, multi-level sampling involving stratified and random techniques were used. Finally, this chapter ended with an illustrative diagram of the empirical research design for the study (Figure 4.5). The next chapter (5) presents empirical descriptive statistical results for the study.

Chapter 5: Research Findings – Descriptive Analysis

Chapter Overview

The previous chapter (4) outlined key research design strategies, philosophical suppositions, and methodologies underpinning this research study. This chapter presents the quantitative data, performs data cleaning, validity, and reliability analyses to pave way for further mathematical evaluations and modelling to establish the levels of e-government adoption and utilisation by citizens in Zambia and Zimbabwe. Descriptive statistics have been identified as the most appropriate method to analyse the data at this level. Frequency, percentages, means, standard deviation, standard error of the mean, skewness and kurtosis were calculated for all the independent factors, dependent adoption and demographic variables under study. Analysis of demographic variables was done across the two countries along two strands, starting with e-government users, and then followed by non-users.

5.1 Research Questionnaire Overview

The survey for this study was carried out in Zambia and Zimbabwe and questionnaires distributed amongst citizens in the Lusaka and Harare provinces. The cover page of the questionnaire gives a brief introduction to the researcher, the institution offering the degree and other essential information relating to the purpose and significance of the study. Moreover, it outlined the ethical concerns observed in-line with participants when administering the study; emphasising their vital participation role to realise the goals of the study. Each questionnaire was issued with an accompanying letter of consent to be signed by each participant, bearing contact details of both the researcher and supervisor; just in case any participant might have some concerns regarding the study.

As described in chapter four on the research methodology, the questionnaire has four major sub-sections. Section A solicited for demographic details of the participants. Section B asked about citizens' experience in using computers and Internet services.

Users' experiences in using ICTs were measured using a 5 point Likert scale. Section C solicited for citizens' experience with, access to and use of e-government systems and government initiatives put in place to assist citizens to use e-government. Major issues to do with system awareness, usability, system and service quality, user satisfaction and trust in e-government systems were sought. Again four and five-point Likert scales were used for assessment and these varied from very easy to very difficult, and 'strongly agree' to 'strongly disagree' respectively. Finally, Section D gathered views of citizens who had never used e-government systems and the inhibiting factors for this. This last section used a combination of simplified questions on two different Likert scales. Firstly, a four-point Likert scale was used to investigate the barriers and challenges affecting citizens in their adoption and utilisation of e-government (ranging from 'strongly affected' to 'not affected'). Secondly, a five-point Likert scale ranging from not important to very important was used to assess the potential and perceived benefits by non-users of e-government systems. The varying nature of the questions that were designed in line with each construct; meant that the Likert scales were also to vary. As much as uniformity in the design is encouraged, it was impossible to have one Likert scale (See Appendix 2 for the nature of questions in the survey questionnaire).

The sample for this study comprised of all citizens of Zimbabwe and Zambia, above the age of 18 years residing in the targeted provinces of Harare and Lusaka. The justification for selecting these two provinces was on the premise that they have municipalities (identifiable regions) with sharp contrasts in terms of levels of affluence and thus giving some relative reflection of the entire picture of the two countries and the SADC region. Overall, 800 participants were involved in the survey – 400 from each country.

5.2 Data Cleaning and Screening Procedures

The process of data cleaning and screening is an integral and prerequisite stage for any meaningful statistical data analysis (Onwuegbuzie & Combs, 2011). According to Alshehri (2012), data cleaning is done to remove any possible errors, identifying missing and duplicate data values, detect and eliminate any possible outliers and univariate normality that could distort final result findings. Moreover, De Jonge and van de Loo (2013) posits that if researchers want their quantitative result findings to be credible, they should give special

attention to data cleaning and screening processes since these pre-data analysis processes are more tedious compared to the final statistical analysis. Alshehri (2012) and Levy (2006) suggests four major reasons justifying the essence of data screening prior to analysis: firstly, to scrutinise and confirm the correctness of gathered data; secondly, to identify and eliminate any possible outliers; thirdly, to detect and deal with missing data sets; and finally, to manage duplicate and any other response-associated issues in the data. The subsections that follow discuss major data screening issues and procedures adopted for this study in-line with the constructs for the modified-UTAUT theoretical framework adopted in this study. Table 5-1 shows the number of items (variables) per construct for e-government users and non-users of e-government systems before and after the data screening process. It should be noted that some variables that were not significant in some way for this analysis were discarded before advanced statistical analysis could be done. As indicated in Table 5-1 by more items per construct 'Before screening' and then fewer items "after the screening" processes.

Table 5- 1: Data Screening for the Study

Constructs	**Construct relevant for;**		**Number of items per construct**	
	E-Gov. Users	Non-E-Gov users	Before	After
Performance Expectancy (PE)	✓		5 (0)	4 (0)
Effort Expectancy (EE)	✓	✓	4 (3)	4 (2)
Social Influence and Habits (SIH)	✓		4 (0)	2 (0)
Privacy, Security and Trust (PST)	✓	✓	9 (3)	6 (3)
Service Quality and Information (SQI)	✓		7 (0)	4 (0)
E-Government Awareness (EA)	✓	✓	8 (3)	3 (2)
Facilitating Condition (FC)	✓	✓	4 (3)	2 (2)
Price Value (PV)		✓	0 (4)	0 (3)
Behavioural Intent (BI)	✓	✓	3 (3)	2 (2)
Use Behaviour (USE)	✓		3 (0)	2 (0)

() = number of items per construct for non e-Government Users before and after data screening.

5.2.1 Dealing with Missing Data

The pre-analysis phase of data analysis involved screening of questionnaires on the basis of item non-response and erroneous completion of the entire questionnaire without paying particular attention to instructions by the participants.

According to Zhang and Yuan (2016) researchers must not ignore dealing with any form of missing data in the sample as this result in biased and inaccurate calculations of Factor Analysis, Pearson's Goodness of Fit and regression analysis for the study. Any questionnaire that was incomplete or wrongly completed sections (for instance completing both sections for citizens who have used e-government and that for those who have not used e-government) in-line with the seven constructs of the proposed conceptual model for this study (Figure 3.9) was excluded in the analysis.

The questionnaires were filtered along two streams: those filled by citizens using or have used any form of e-government in their lives and those completed by citizens who were non-users of e-government. This splitting formed the basis for data analysis for the case study. As indicated in Figure 4-6 and Figure 4-7 in Chapter 4, overall, 800 questionnaires were conveniently distributed to citizens at various public areas like shops, offices, residential areas and markets; 400 in each country according to the identified strata (City Region). This process took place over a period of five months, commencing in August 2015 and ending in December 2016. Out of the 800 distributed questionnaires, a total of 765 were returned, indicating a 95.6% response rate. Out of the 765 questionnaires returned, 29 were considered unfit for analysis in-line with the researcher's criteria explained earlier in this section. This left 736 (92%) questionnaires ideal for data analysis – 489 representing those who have used e-government and 247 have not used. The overall response rate for this study is considered more than adequate, especially given that the recommended acceptable response rate for a survey is 30% (Alshehri, 2012; Sekaran, 2003). The research used self-administering of the survey questionnaire to collect data, coupled with follow-ups and this led to such high participation. However, the researcher should acknowledge that this process was painstakingly long and excruciating given that data gathering was done in two countries with complicated transport networks.

5.2.2 Variable Development and Definition

The process of variable development and definition marked the first and most crucial stage of data analysis using IBM SPSS Statistics version 23. Pallant (2013) recommend that statisticians should dedicate enough time to parameter variable development in the IBM SPSS Statistics 'variable view' environment. He argues that the accuracy of all the subsequent steps of data capturing and data analysis are dependent upon accurate variable development and definition; hence the researcher paid special attention to it in this study. The process of variable development and definition for this study took a period of one week.

Careful thought was given to dissociating any possible double-barrelled and compound questionnaires and responses that could lead to inaccurate analysis and misrepresented responses. In two sections of the questionnaire on demographic (A), experience in using computer and the internet (B) aspects of respondents, simple Likert scales were used; except only for question number five were geographical regions of the two provinces of Lusaka and Harare had to be merged to create a second variable called 'level of affluence' (Medeiros & de Souza, 2014; Wołoszyn & Wołoszyn, 2015). As indicated earlier on, the 'level of affluence' measures the observable quality and level of infrastructure in each locality (buildings, roads, bridges, ICTs, telecommunication infrastructure, mobile service providers, hospitals and clinics, schools and universities) and this has an effect on citizens' adoption and utilisation of e-government. Generally, the predominant data measurements used for most variables were nominal and ordinal because only simple descriptive statistics like frequencies and percentages had to be established.

Section C of the questionnaire regard citizens' access to and use of e-government; and citizens' expectations from e-government systems, each of the states falling under a question was treated as an independent variable, (Joshi, Kale, Chandel & Pal, 2015). For instance in Question 16 of the questionnaire, participants were required to respond to each of the eight possible actions being undertaken by their governments in assisting them to adopt and utilise e-government. Then the possible responses (agree, neutral, disagree and not sure) forms a 4-point Likert scale. All such data were assigned a 'scale' data measurement to enable performing advanced statistical measures like mean, standard deviation, standard error of means, skewness, kurtosis, factor analysis, Pearson's Goodness of Fit and regression analysis.

Thematic analysis and coding were used to analyse the open-ended question 31 in Section D on the Questionnaires on 'What do you think should be done by the government to promote the adoption of e-government systems by citizens in your country?' Six major themes were established (intervention_ICT-infrastructure; intervention_strengthen consultative mechanisms with citizens; intervention_strengthen security on e-government systems; intervention_cultivate political will/governance; intervention_remove any other barriers) and a binary response (Schmidheiny, 2015) was assigned along each of these six themes; thus allowing the researcher the leverage to perform various statistical analysis on the qualitative responses.

5.2.3 Data Entry Procedure

Data entry is the process of capturing data from the questionnaires, one by one into the IBM SPSS Statistics 'data view' environment. This was done following successful data screening, variable development, and definition; in-line with recommendations made by expert panel members of the research proposal defence that the researcher should execute all the analysis process in person to ensure credible results. Data capturing was done concurrently with data gathering over a period of six months (October 2015 to March 2016). Bornman (2009) advised researchers to be meticulous during data entry since wrong entries lead to false responses and unreliable findings. The use of hard-copy questionnaires to increase retention rate had its impact on data entry – it prolonged the process. The completion of the data entry process, paved way for the data analysis phase as outlined in the following sections below.

5.2.4 Dealing with Common Methods Bias

According to Podsakoff, MacKenzie and Podsakoff (2012), common method bias (CMB) occurs when a measurement instrument (i.e. survey questionnaire) introduces some discrepancies in responses due to the way in which it is designed and phrased as opposed to the real dispositions of respondents. In this study, both the independent and dependent variables were measured using the same questionnaire and the same respondents. As a result, the possibility of common method bias is rife and deserves scrutiny. The researcher used two approaches in this study for testing and dealing with common method bias: (a) Harman's one-factor test to detect common method variance (CMV) for the exploratory factor analysis (EFA)

and (b) the confirmatory factor analysis (CFA) post-hoc technique (using convergent and discriminant maker variables) to detect common method variance. The CFA model is applied in Sections 6.5.1.2 and 6.5.1.3 of this thesis.

The Harman's single-factor test was applied along the two streams in which data for this research was analysed: Use Behaviour (E-Government Users) and Behavioural Intention (Non-users of e-government). The rule of thumb for Harman's single-factor test is that the first major component's Eigenvalue (percentage of variance) should be less than 50% to demonstrate the absence of the common method bias (Mudzana & Maharaj, 2017; Podsakoff, MacKenzie & Podsakoff, 2003).

Findings showed that when the first major component (for e-government users) was extracted, only14.953% of the variance was explained (see Appendix 8). This demonstrates that the remaining variance that was not extracted explain a significant amount of the factors. Therefore, the findings demonstrate the absence of common method bias. Similarly, a 32.431% variance score extracted (see Appendix 8) for the first component of non-users of e-government indicate that the common method bias was no problem in this study for both users and non-users of e-government.

5.2.5 Dealing with Univariate Normality

Prior to conducting regression and multivariate analyses, the data should first be tested for homogeneity to establish data distribution for all the variables in-line with the normal distribution (Alshehri, 2012). According to Alsaif (2013), there are two broad ways of testing univariate normality; statistically or graphically. The graphical analysis assesses the histogram of the survey data values along three strands of the normal distribution, positively skewed and negatively skewed; while statistical techniques use Pearson's Skewness parameter test to establish univariate normality. For a robust analysis of results, both approaches have been adopted at various levels in this study. Furthermore, Kim (2013) state that the assessment of normality is sensitive to sample sizes and suggests that for large sample size ($n > 300$) researchers should use skewness and kurtosis for testing univariate normality. Visual assessment of all the histogram distribution of data for this study reveals that the univariate normality shapes were reasonably normal and acceptable.

Kurtosis measures the "relative peakedness or flatness of a distribution compared with the normal distribution" (Čisar & Čisar, 2010: 96). According to Kim (2013), the kurtosis value for a normally distributed hectograph value is zero; whilst for leptokurtic distribution (high peak) the kurtosis value is positive and for platykurtic distribution (flat-topped curve) has negative kurtosis values. If the measures for skewness and kurtosis are to be essential for establishing the distribution of data values for any study and if the values are too big or too small, the researcher should be concerned about the normality of the data values (Kim, 2013; Alsaif, 2013; Čisar & Čisar, 2010). Findings of this study (Table 5-2 and Table 5-3) show that values for all the constructs were within the acceptable ranges of skewness and kurtosis (that is, -3 → +3, Kim, 2013: 53). The only exception was the kurtosis value for E-Government Awareness for non-users, which had a value of 4.766. However, this indicated that the distribution of the results for EAn was leptokurtic distribution (high peak) and this is dealt with in Factor Analysis screening in Chapter 6.

Table 5- 2: Measures of normality of variable constructs: e-Gov Users (N = 489)

Constructs	***Skewness***	***Kurtosis***
Performance Expectancy (PE)	-0.68125	1.23175
Effort Expectancy (EF)	-0.41075	-0.43575
Social Influence and Habits (SIH)	1.29350	1.79300
Privacy, Security and Trust (PST)	1.20250	2.15950
Service Quality and Information (SQI)	0.25625	-0.76500
E-Government Awareness (EA)	0.80225	0.58825
Behavioural Intention (BI)	-1.55050	2.47250
Use Behaviour (USE)	0.14150	-0.56500

Table 5- 3: Measures of normality of variable constructs: non-users of e-Gov (N = 247)

Constructs	Skewness	Kurtosis
Effort Expectancy (EFn)	-0.9800	0.9005
Facilitation Condition (FCn)	-0.8377	0.2623
Privacy, Security and Trust (PST)	-0.1843	-0.9307
Price Value (PVn)	-1.1530	-1.1017
E-Government Awareness (EAn)	-2.2477	4.7660
Behavioural Intention (BIn)	-0.0550	-1.2873

5.2.5 Dealing with Outliers

In any research study, it is common to have extreme data values or observations that are either 'very high' or 'very low' than the majority of the research data. Such data values are technically called outliers and they distort computations for mean values, regression tests, increase the standard deviation and present bias to the embraced e-government adoption and utilisation model (Alsaif, 2013). Alshehri (2012) posit that researchers should always screen out research data for outliers since they can prejudice the quality of result findings. Furthermore, Alshehri (2012) identifies two broad classes of outliers: univariate outliers and multivariate outliers. Univariate outliers are unusual data values affecting one variable; whereas multivariate outliers exist where there are uncommon combinations of values for many variables. Cousineau and Chartier (2010:66) suggest that in a multivariate design were the kurtosis distribution of a construct-scale is leptokurtic (i.e. E-Government Awareness, EAn in Table 5-3) researchers have the discretion to return the value since too much removal of constructs leads to restrictive statistical analysis. To identify and screen outliers, this study has adopted the technique of calculating the standard deviations of all the measurement constructs. The golden rule of thumb, in line with Alzahrani (2011:139) is that any construct scale with a standard deviation value more than three should be regarded as an outlier and be discarded from the further statistical analysis. Findings of this study revealed that there were no cases of outliers within the data set.

5.3 Descriptive Statistics

As indicated earlier on, this chapter uses descriptive statistics to analyse the survey data. Alsaif (2013) posit that descriptive statistics are most suitable for describing variables and this can be achieved in two ways: firstly, by analysing one variable at one go (univariate analysis) and secondly by performing grouped frequency tabulation of two or more variables (crosstabulations). Therefore, combinations of numerical and graphical methods were used to present descriptive statistical data in this chapter since the two methods complement each other in real-world practice. Within the numerical approach, frequencies, percentages, means, standard error of mean, skewness and kurtosis were used for data analysis. The graphical approach makes use of graphs and tables to identify and portray patterns of interest within the data. Subedi (2016) suggest that researchers should carefully decide on the scales of measurements assigned to variables during the variable development and definition phase to avoid interpretation problems that may arise when the research decides to perform interval scale analysis on ordinal and nominal data. Therefore, in-line with Subedi's (2016) suggestion, four different data measurement scales (nominal, ordinal, interval and ratio) were used in this study to allow the researcher to perform a mixture of statistical computations.

This chapter on descriptive statistics provides an initial phase for eliminating some ambiguity that often manifests with raw data and provides the ideal basis for advanced statistical analysis like factor analysis, Pearson's Goodness of Fit, regression analysis and structural equation modelling required to test the hypotheses for the study. Reflecting on the literature review, most studies focus on e-government adoption in individual member countries (Al-Shafi & Weerakkody, 2010; Bwalya, 2011; Abdalla, 2012; Alsaif, 2013;) and posit that an individual's level of education, computer and internet experience, age and gender have an influence on one's adoption decisions. However, this study took the stance that in addition to these factors, social influence; e-government awareness; service quality; location in which one resides; price value; privacy, security and trust all play a major role in influencing citizens' decision to use e-government in Zimbabwe and Zambia. Furthermore, the study went a step further than previous studies on e-government adoption by differentiating e-government adoption from e-government utilisation. According to this study, e-government adoption defines a citizen's decision on whether to use or not use (accept) e-government services. Whereas e-government utilisation is the continual usage of a particular e-government system by someone and it is this utilisation.

5.4 Demographic Analysis of e-Government Users

This section seeks to analyse the demographic characteristics of e-government users. The analysis is based on the following variables; gender, age, home language, nationality, place of residence, highest education qualification, occupation status, experience in using computers, experience in using smartphones and experience in using the internet. Therefore, analysis of data is done within a particular country and across the two countries (cross tabulations) against different variable scales. In total 489 respondents have used e-government and are under scrutiny in this section.

5.4.1 Gender analysis of e-Government users

Table 5- 4: Gender analysis of e-Government users

			Nationality			Total
			Zambia	Zimbabwe	Other	
Gender of Participants	Female	Frequency	97	134	0	231
		% within Gender of Participants	42.0%	58.0%	0.0%	100.0%
		% within Nationality	41.8%	52.3%	0.0%	47.2%
	Male	Frequency	135	122	1	258
		% within Gender of Participants	52.3%	47.3%	0.4%	100.0%
		% within Nationality	58.2%	47.7%	100.0%	52.8%
Total		Frequency	232	256	1	489
		% within Gender of Participants	47.4%	52.4%	0.2%	100.0%
		% within Nationality	100.0%	100.0%	100.0%	100.0%

Table 5-4 illustrate that overall male (52.8%) participants in this study dominated female (47.2%) participants in e-government system utilisation. Findings of this study are expected in the context of most developing nations where more males tend to be highly task-oriented than females and participate more on online systems (AlAwadhi, 2009) as in the case for Zambia. However, findings for Zimbabwe contradicts this notion. Moreover, the findings concur with

the findings of previous studies on e-government adoption and utilisation (Albersher, 2015; Tarhini, Elyas, Akour & Al-Salti, 2016).

5.4.2 Age profile of e-Government users

Figure 5-1 shows that the majority of respondents for this study using e-government systems were within the 25 to 45 (61.96%) age group. Several previous studies (Ha, 2016; Nkwe, 2012) demonstrated that the active and working class age groups dominate users of e-government systems. However, the findings of this study are inconsistent with findings of (Park & Estrada, 2012; Hardill, 2013; Bloom & McKinnon, 2013) who established that more pensioners adopt and utilise e-Pension Systems to access old-age income support and grants.

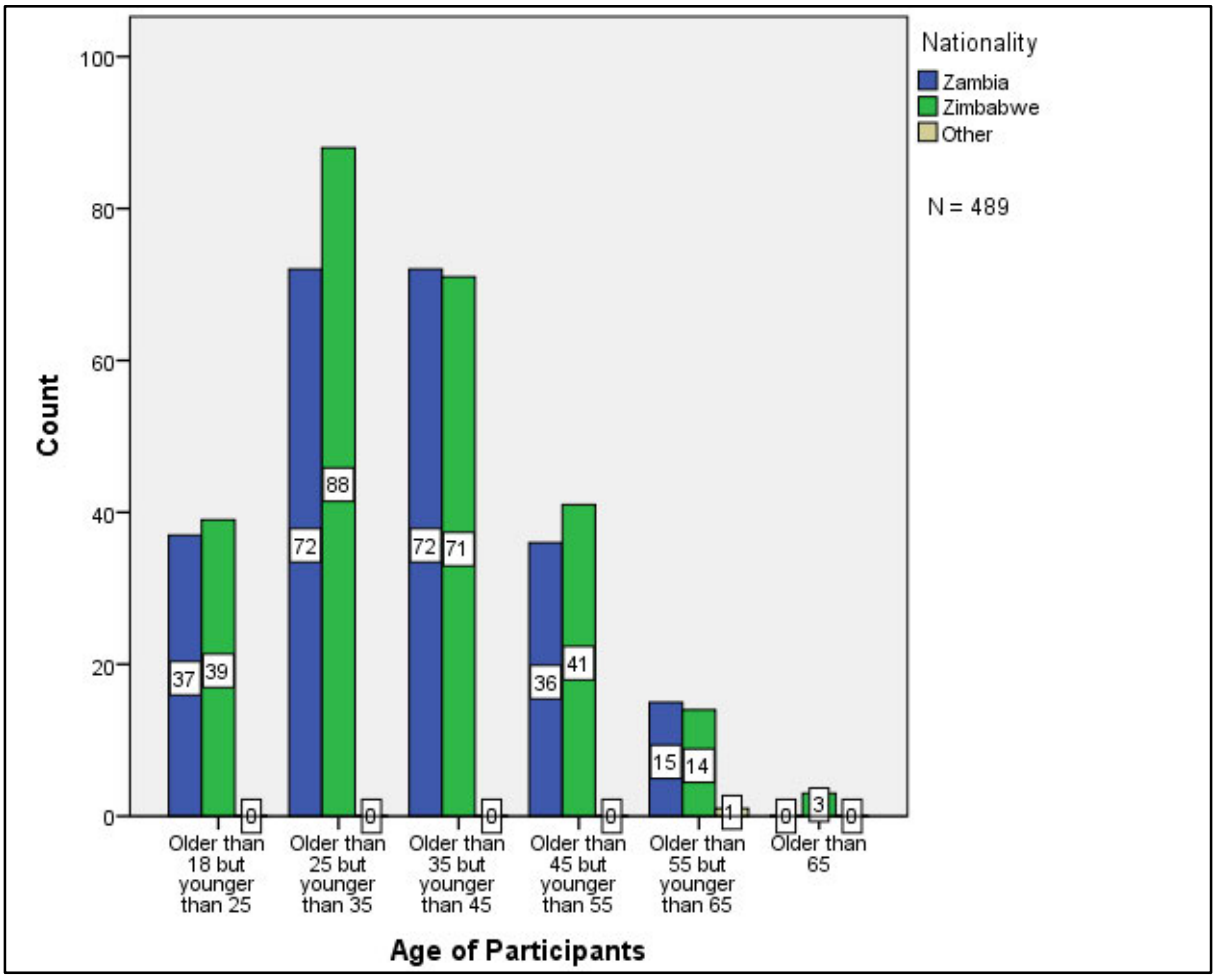


Figure 5- 1: Age profile of e-Government users

5.4.3 Major language spoken by e-Government users

The respondents were requested to identify the language that they use to communicate most of the time in their homes. Figure 5-2 shows that Bemba (33.2%) and Nyanja (36.6%) were the widely spoken languages in the Lusaka Province of Zambia, whilst Shona (61.3%) dominated in the Harare Province of Zimbabwe. It is interesting to note that in both countries, there was the low usage of the English language by respondents, 11.3% and 7.3% for Zimbabwe and Zambia respectively. Given the background that most e-government systems in the SADC region are written in English; it is suggested in studies done by (Majdalawi et al. 2015; Mzyece, 2012) that the lack of content in indigenous languages has a negative impact on accessibility and utilisation by citizens.

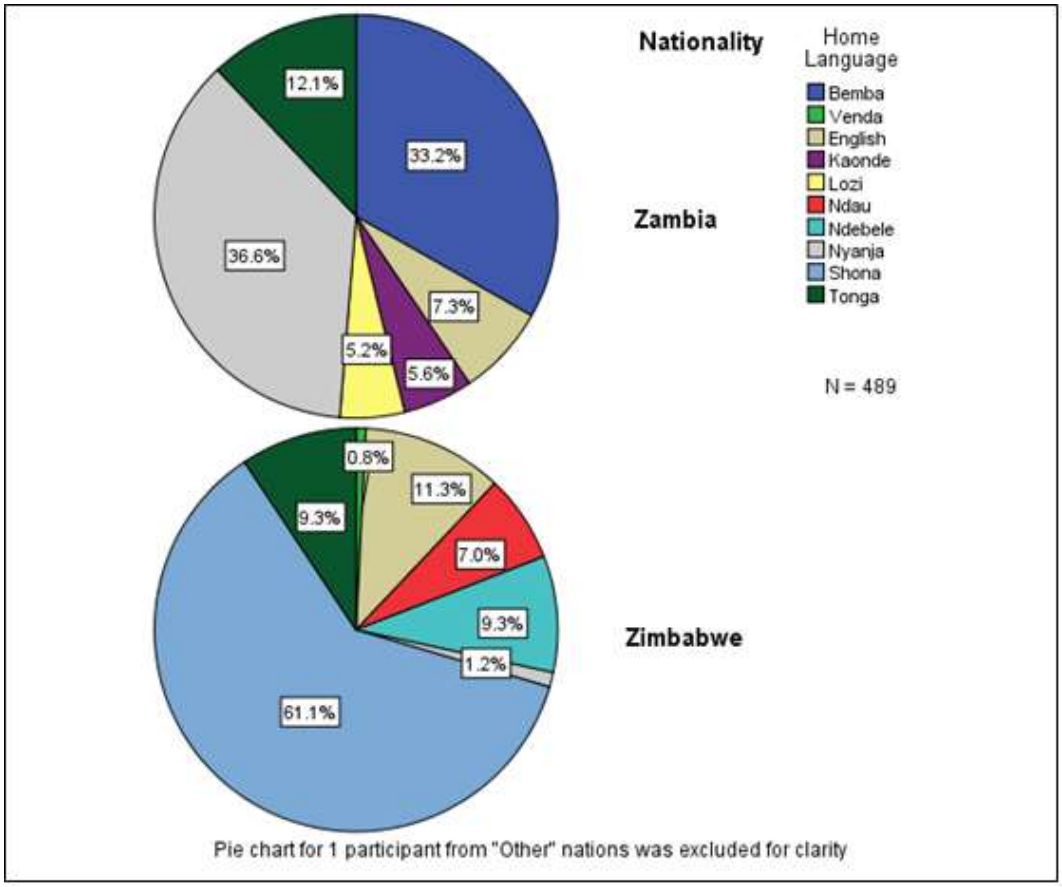


Figure 5- 2: Major language spoken by e-Government users

5.4.5 Place of residence of e-Government users

As indicated earlier on in Chapter 2, place of residence of respondents is associated with different levels of affluence, digital divide; and thus have got an effect on citizens' adoption

and utilisation of e-government systems. Table 5-5 indicate that the majority of respondents who were using e-government systems for both Zambia (86.2%) and Zimbabwe (75.8%) lived in urban areas. These findings demonstrate the strong effect of centripetal forces of geographical concentration in which the agglomeration of resources (people, financial investments and much more) tend to flow towards and concentrated in urban areas. It is also interesting to note that centrifugal (out-migration) forces are pushing the affluent, educated, middle to high-income people to migrate from congested urban areas to peri-urban and sub-urban for both Zimbabwe (20.3%) (Potts, 2013) and Zambia (12.1%) (Zambia Central Statistical Office, 2013).

Table 5- 5: Place of residence of e-Government users

Residential Area	Descriptive Statistics	Nationality		
		Zambia	Zimbabwe	Other
Urban (Harare Urban & Lusaka Central)	Frequency	200	194	0
	% within Nationality	86.2%	75.8%	0.0%
Peri-Urban (Kafue & Chitungwiza)	Frequency	15	42	0
	% within Nationality	6.5%	16.4%	0.0%
Sub-Urban (Chongwe & Epworth)	Frequency	13	10	1
	% within Nationality	5.6%	3.9%	100.0%
Rural (Luangwa & Harare Rural)	Frequency	4	10	0
	% within Nationality	1.7%	3.9%	0.0%
Total	Frequency	232	256	1
	% within Nationality	100.0%	100.0%	100.0%

The findings demonstrate that e-government facilities and utilisation in most developing countries are concentrated in urban areas where most people could allow the service as supported by findings of the study done by (Mahundu, 2016; Sharma, Bao & Peng, 2014). However, the observed utilisation of e-government systems in the peri-urban and suburban areas of the two countries has been attributed to centrifugal forces pushing the affluent and educated citizens to these areas as supported by the study done by Li (2011) in China.

5.4.6 Highest Educational Qualifications of e-Government users

The respondents were requested to indicate their highest educational qualifications. As indicated in Figure 5-3, the majority (60%) of the participants had diplomas and first degrees, whilst doctorate holders constituted the least number of respondents (15) using e-government systems. One interesting observation is that for all qualification categories (except for certificates) Zimbabwean respondents dominated Zambians. Findings of this study concur with findings of the study done by the United Nations Economic Commission for Africa (2015a; 2015b) which reported the adult literacy rate to be at 97.7% for Zimbabwe and 81% for Zambia. However, findings of this study disagree with the United Nations e-Government Survey (2016) which rated Zambia's overall human capital index (HCI) (0.5643) for the year 2016 higher than that of Zimbabwe (0.5641).

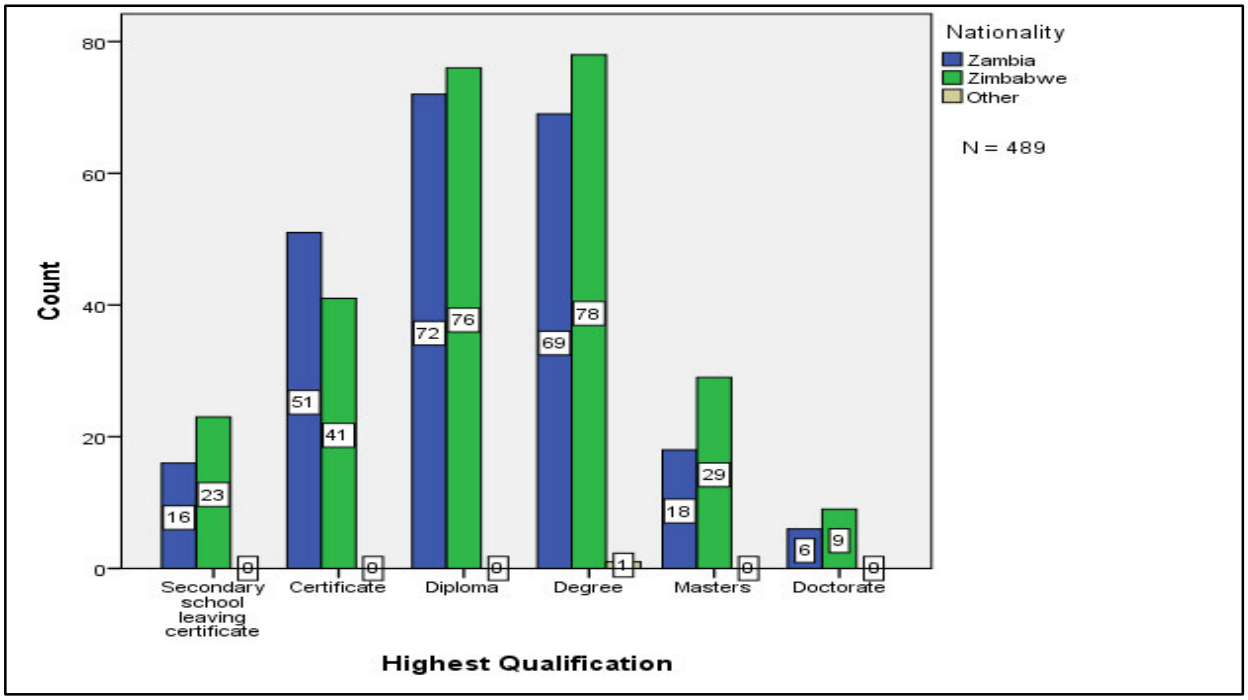


Figure 5- 3: Highest Educational Qualifications of e-Government users

5.4.7 Occupation Status of e-Government users

Ray, Sissons, Jones and Vegeris (2014:20) suggest that an individual's occupational status "has a strong bearing on poverty outcomes since earnings from paid work are the single largest source of income for most households" across the world. Therefore, analysis of the

occupational status of e-government users was essential since it affects whether one could personally allow the cost of accessing both the internet and e-government.

As illustrated in Table 5-6, the largest number of Zimbabwean respondents (53.1%) was either unofficially employed (41.4%) or students (11.7%). However, these findings are inconsistent with Bertelsmann Stiftung (2016a) and Rusvingo (2014) who reported the unemployment rate for Zimbabwe to be above 80%. This was expected, mainly due to the fact the majority of people in Harare are engaged in informal businesses, hence why the unemployment rate stood at 54.4%; which still claims a high unemployment rate.

For the Zambian sub-case, Table 5-6 shows that the largest proportion of respondents (60%) were employed, whilst 24.1% were unemployed. These findings concur with findings of Bertelsmann Stiftung (2016b) who estimated the unemployment rate for Zambia to be below 50%. In-line with occupation status of respondents, this study established that there is higher unemployment in Zimbabwe than in Zambia and this could be attributed to the drastic economic decline in Zimbabwe which is also affecting the informal sector (Rusvingo, 2014).

Computer experience was measured using a 6 point Likert scale. Responses were ordered as follows; 1 = no experience; 2 = less than 6 months; 3 = more than 6 months but less than 1 year; 4 = more than 1 year but less than 2 years; 5 = more than 2 years but less than 5 years; 6 = more than 5 years. The analysis of the means procedure revealed a relatively high experience in terms of computer usage as evidenced by the high mean values of more than 5.0 for all countries (Table 5-7). These results were found to be consistent in all response categories as further evidence measures of normality revealed relatively acceptable levels of Skewness and Kurtosis.

Table 5- 6: Occupation Status of e-Government users

Occupation Status	Descriptive statistics	Nationality			Total
		Zambia	Zimbabwe	Other	
Government Employee	frequency	31	36	1	68
	% within Occupation Status	45.6%	52.9%	1.5%	100.0%
	% within Nationality	13.4%	14.1%	100.0%	13.9%
Private sector Employee	frequency	80	51	0	131
	% within Occupation Status	61.1%	38.9%	0.0%	100.0%
	% within Nationality	34.5%	19.9%	0.0%	26.8%
NGO Employee	frequency	28	15	0	43
	% within Occupation Status	65.1%	34.9%	0.0%	100.0%
	% within Nationality	12.1%	5.9%	0.0%	8.8%
Student	frequency	28	30	0	58
	% within Occupation Status	48.3%	51.7%	0.0%	100.0%
	% within Nationality	12.1%	11.7%	0.0%	11.9%
Self Employed	frequency	30	75	0	105
	% within Occupation Status	28.6%	71.4%	0.0%	100.0%
	% within Nationality	12.9%	29.3%	0.0%	21.5%
Unemployed	frequency	26	31	0	57
	% within Occupation Status	45.6%	54.4%	0.0%	100.0%
	% within Nationality	11.2%	12.1%	0.0%	11.7%
Other	frequency	9	18	0	27
	% within Occupation Status	33.3%	66.7%	0.0%	100.0%
	% within Nationality	3.9%	7.0%	0.0%	5.5%
Total	frequency	232	256	1	489
	% within Occupation Status	47.4%	52.4%	0.2%	100.0%
	% within Nationality	100.0%	100.0%	100.0%	100.0%

5.4.8 Experience in using the computer for e-Government users

For relatively large samples, it is a major requirement to test for normality in the distribution since the average is considered to be a reliable summary measure when dealing with normal distributions (de Araujo & Tejedo-Romero, 2016; Ikediashi & Ogwueleka, 2016) as opposed to non-normal distributions. For this reason, the study utilised Pearson's skewness and kurtosis as statistical parameters for analysing the distribution of responses. Results, as depicted in the Table 5-7 revealed reasonable and acceptable levels of normality. According to Kim (2013:53),

the acceptable range of normality for large sample sizes for both Skewness and kurtosis should be +/-3. Most of the values indicated in Table 5-7 falls within these acceptable limits. The exception, however, is the kurtosis value for Zambia (3.626). This probably reflects variability in terms of computer usage among citizens within and across different geographical areas.

Table 5- 7: Experience in using the computer for e-Government users

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	5.15	232	1.083	.071	-1.759	3.626
Zimbabwe	5.09	256	1.195	.075	-1.682	2.658
Other	6.00	1	.	.	.	.
Total	5.12	489	1.142	.052	-1.722	3.067

5.4.9 Experience in using a smartphone - e-Gov users

Again, the same 6-point likert scale, similar to the one used for computer experience was used for evaluating respondents' experience in using smartphones. Poushter (2016) posit that smartphones have revolutionised the landscape of internet access, e-commerce, internet banking, m-banking, and m-government. Therefore, their impact on e-government adoption and utilisation cannot be ignored (OECD, 2015).

As illustrated in Table 5-8, the analysis of means procedure revealed relatively high participant experience with smartphone usage and this is confirmed by high mean values of more than 5.0 for all countries. Moreover, the findings of this study were found to be consistent in with all response categories. Additional evidence measures of normality revealed reasonable and relatively acceptable levels of skewness and kurtosis in-line with Kim (2013). However, the negative values for skewness shown in both Table 5-7 and Table 5-8, simply illustrate that a histogram with an asymmetric tail extending towards the left; but still within acceptable values of normality. Similarly, positive kurtosis values reveal a leptokurtic distribution (high peak) and again with the +/-3 acceptable range of normality.

Table 5- 8: Experience in using a smartphone

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	5.22	232	.902	.059	-1.092	.626
Zimbabwe	5.08	256	1.089	.068	-1.460	2.028
Other	6.00	1	.	.	.	.
Total	5.15	489	1.006	.045	-1.379	1.878

5.4.10 Frequency of internet use by e-Government users

The frequency of internet use by respondents was measured using a 4 point likert scale. Responses to how often do you use the internet were ordered as follows; 1 = not sure; 2 = daily; 3 = once or more times per week; 4 = once or more times per month.

The analysis of means procedure revealed a relatively high frequency in terms of internet usage as evidenced by the high mean values of more than 2.5 for all countries (see Table 5-9). Furthermore, Table 5-9 revealed reasonable and acceptable levels of normality. This is evidenced by Skewness and kurtosis values falling within the +/-3 recommended ranges (Kim, 2013). Negative kurtosis values obtained in Table 5-9 indicate a platykurtic distribution (flat-topped curve); however, all values are within acceptable data ranges.

Table 5- 9: Frequency of internet use by e-Government users

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	2.59	232	.639	.042	.628	-.576
Zimbabwe	2.52	256	.594	.037	.675	-.498
Other	3.00	1	.	.	.	.
Total	2.55	489	.616	.028	.654	-.523

5.4.11 E-Government Systems used by citizens

Different types of e-government systems used by respondents were measured using a 5 point likert scale. Responses to which of the presented e-government system one had used were ranging from 1 (strongly disagree) to 5 (strongly agree). A wide range of e-government systems

pertinent to Zimbabwe and Zambia were listed and respondents asked to tick (see Appendix 11 for the set of e-systems). The analysis of means procedure revealed a relatively high frequency in terms of e-government usage as evidenced by the high mean values (ranging from 2.06 for those using online tendering systems to 3.95 for those using education and training services) for all countries. Furthermore, the Table respondents who have used e-government systems in Appendix 11 revealed reasonable and acceptable levels of normality. This is evidenced by Skewness and kurtosis values falling within the +/-3 recommended ranges (Kim, 2013). Negative kurtosis and skewness values obtained for both Table Appendix 11 indicate a platykurtic distribution (flat-topped curve); nevertheless, all values are within acceptable data ranges.

5.5 Demographic Analysis of non-users of e-Government

In this section analyse of demographic characteristics of respondents who did not use e-government systems is given. The analysis is based on similar variables that have been assessed for participants who have used e-government. The only exception variable to this section is the affluence level of the place of residence of the participants. Similarly, data analysis is done firstly along national lines and secondly, across the two countries (cross tabulations) against different variable scales. Overall, 247 respondents indicated that they have never used e-government systems and are the main subject of discussion in this section. The interpretation of major measurements like skewness and kurtosis have already been explained in section 5.2.4 of this chapter and only interpretations are given in this section.

5.5.1 Gender analysis of non-users of e-Government

Table 5-10 shows almost equal percentages of females and males not adopting e-government systems for both Zambia and Zimbabwe. However, the findings of this study are inconsistent with studies done by Albesher (2015) and Alsaif (2013) who found that more females than men were not adopting e-government systems in developing countries. A possible explanation for this could be the more and more women are now getting the opportunity to attend education than before through numerous gender equity initiatives (African Development Bank, (2015), get exposed to the internet and thus adopting different types of e-government systems.

Table 5- 10: Gender of non-users of e-Government

			Nationality			Total
			Zambia	Zimbabwe	Other	
Gender of Participants	Female	Frequency	62	65	1	128
		% within Gender of Participants	48.4%	49.6%	0.8%	100.0%
		% within Nationality	55.4%	49.6%	25.0%	51.8%
	Male	Frequency	50	66	3	119
		% within Gender of Participants	42.0%	50.4%)	2.5%	100.0%
		% within Nationality	44.6%	50.4%	75.0%	48.2%
Total		Frequency	112	131	4	247
		% within Gender of Participants	45.3%	53.0%	1.6%	100.0%
		% within Nationality	100.0%	100.0%	100.0%	100.0%

5.5.2 Age profile of non-users of e-Government

Figure 5-4 shows that more Zimbabwean respondents aged between 18 and 55 years were not adopting e-government systems. However, the only exception was the above 55 years where more Zambian respondents were not using e-government systems.

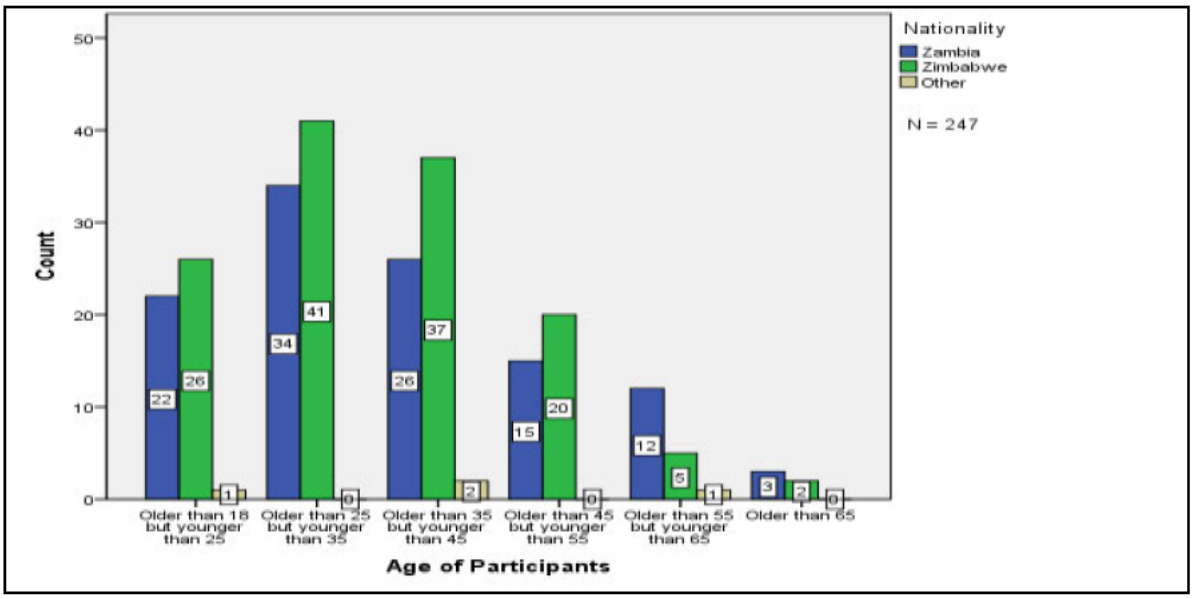


Figure 5- 4: Age profile of non-users of e-Government

5.5.3 Language spoken by non-users of e-Government

The respondents were invited to identify the language that they use to communicate most of the time in their homes. As shown in Figure 5-5, the majority of respondents for both countries, 63.2 per cent (Shona) for Zimbabwe and 82.4 per cent (Bemba, Nyanja and Kaonde) for Zambia spoke vernacular languages. However, it is interesting to note that 4.4% of the Zambian and 3.8% of Zimbabwean respondents of English speaking origin were not using e-government systems. Given the background that most e-government systems are written in English; it is suggested in studies done by (Alharbi, Papadaki & Dowland, 2014; Shalhoub, 2006) that the non-adoption of e-government system in such context could be attributed to other factors like privacy, security and trust fears by the citizens.

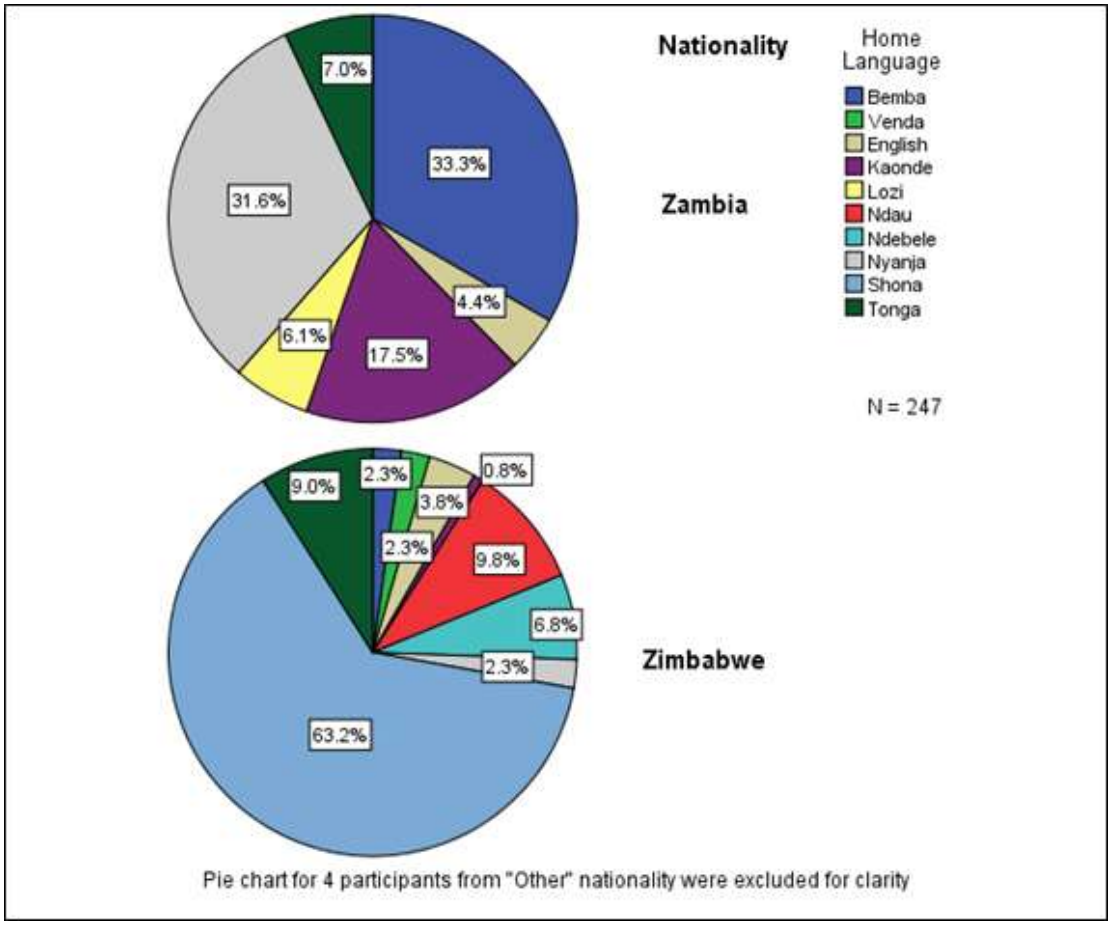


Figure 5- 5: Language spoken by non-users of e-Government

5.5.5 Place of residence of non-users of e-Government

All respondents who have not used e-government services were asked to indicate their place of residence. Table 5-11 shows that the majority of respondents for both Zambia (64.3 percent) and Zimbabwe (51.2 percent) who were not using e-government systems resides in urban areas. These results support findings of (Zejnullahu & Baholli, 2017; Ponge, 2016; United Nations Economic and Social Council, 2014) in which digital divide and utilisation divide of ICTs and e-government systems were found to be prevalent amongst the rich and the poor, and along gender lines within the same city.

Table 5- 11: Place of residence of non-users of e-Government

Residential Area	Descriptive Statistics	Nationality		
		Zambia	Zimbabwe	Other
Urban (Harare Urban & Lusaka Central)	Frequency	72	67	2
	% within Nationality	64.3%	51.2%	50.0%
Peri-Urban (Kafue & Chitungwiza)	Frequency	23	26	1
	% within Nationality	20.5%	19.8%	25.0%
Sub-Urban (Chongwe & Epworth)	Frequency	16	21	1
	% within Nationality	14.3%	16.0%	25.0%
Rural (Luangwa & Harare Rural)	Frequency	1	17	0
	% within Nationality	0.9%	13.0%	0.0%
Total	Frequency	112	131	4
	% within Nationality	100.0%	100.0%	100.0%

5.5.6 Level of Affluence of place of residence of non-users of e-Government

As indicated in section 5.2.2 of this chapter, the level of affluence had an effect on citizens' adoption and utilisation of e-government. The eight residential areas identified in Table 5-12 were classified into a 4 likert scale of affluence, defined as follows: 1 = Very Low (Harare Rural, Luangwa); 2 = Low (Epworth, Chongwe); 3 = Medium (Chitungwiza, Kafue) and 4 = High (Harare Urban, Lusaka Central). For all the countries under study, result findings showed that high-affluent residential areas had the largest numbers of respondents who were not using e-government, 141 (57.1%); followed by medium-affluent with 50 (20.2%). These findings concur with findings of Ponge (2016) who established that access and utilisation divide of ICTs are widespread within cities and across the nation in developing countries.

Table 5- 12: Level of Affluence of place of residence

Level of affluence of the place of residence	Descriptive Statistics	Nationality			Total
		Zambia	Zimbabwe	Other	
Very Low (Harare Rural, Luangwa)	Frequency	3	17	0	20
	% within Level of affluence of the place of residence	15.0%	85.0%	0.0%	100.0%
	% within Nationality	2.7%	13.0%	0.0%	8.1%
Low (Epworth, Chongwe)	Frequency	15	20	1	36
	% within Level of affluence of the place of residence	41.7%	55.6%	2.8%	100.0%
	% within Nationality	13.4%	15.3%	25.0%	14.6%
Medium (Chitungwiza, Kafue)	Frequency	23	26	1	50
	% within Level of affluence of the place of residence	46.0%	52.0%	2.0%	100.0%
	% within Nationality	20.5%	19.8%	25.0%	20.2%
High (Harare Urban, Lusaka Central)	Frequency	71	68	2	141
	% within Level of affluence of the place of residence	50.4%	48.2%	1.4%	100.0%
	% within Nationality	63.4%	51.9%	50.0%	57.1%
Total	Frequency	112	131	4	247
	% within Level of affluence of the place of residence	45.3%	53.0%	1.6%	100.0%
	% within Nationality	100.0%	100.0%	100.0%	100.0%

5.5.7 Highest Educational Qualifications of non-users of e-Government

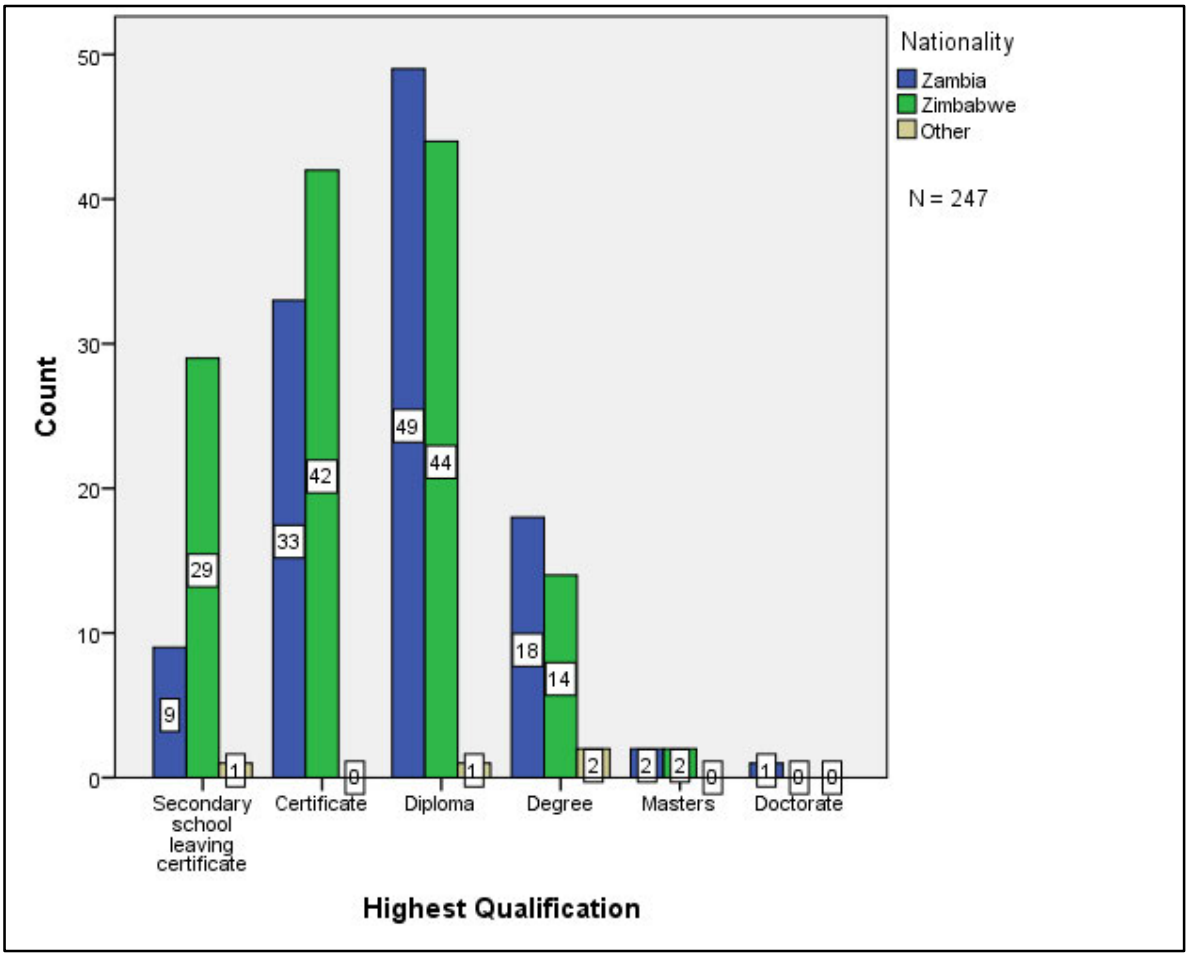


Figure 5- 6: Highest Educational Qualifications of non-users of e-Government

Findings show that the minority of non e-government users are those holding higher qualifications (degree, masters and doctorate) (see Figure 5-6). Findings of this study agree with the findings of Al-Shafi and Weerakkody (2010) who suggest that individuals and citizens who hold higher qualifications are more likely to adopt new technology innovations.

5.5.8 Occupation Status of non-users of e-Government

Table 5-13 illustrate the occupation status of respondents along seven different categories, ranging from government employee; private sector employee; NGO employee; student; self-employed; unemployed to others; for the case study. According to Ray et al., (2014), earnings from employment constitute the largest source of income for most households in developing countries.

As such, the occupation status of an individual in most cases has a bearing on their disposable income and allowability of adopting new technologies like e-government. Table 5-13 shows that the majority of respondents (150) for both countries not adopting e-government systems were students, unemployed, self-employed or others categories. Findings of these study support findings of a study done by Venkatesh, Thong and Xu (2012) which found that in the consumer context (e-government included); users are directly affected by the price value of accessing such e-services. As such, their occupation status becomes an essential aspect as it affects their disposable income, allowability and likelihood of using e-government systems.

Table 5- 13: Occupation Status of non-users of e-Government

Occupation Status	Descriptive Statistics	Nationality			Total
		Zambia	Zimbabwe	Other	
Government Employee	Frequency	3	4	0	7
	% within Occupation Status	42.9%	57.1%	0.0%	100.0%
	% within Nationality	2.7%	3.1%	0.0%	2.8%
Private sector Employee	Frequency	26	18	1	45
	% within Occupation Status	57.8%	40.0%	2.2%	100.0%
	% within Nationality	23.2%	13.7%	25.0%	18.2%
NGO Employee	Frequency	14	2	0	16
	% within Occupation Status	87.5%	12.5%	0.0%	100.0%
	% within Nationality	12.5%	1.5%	0.0%	6.5%
Student	Frequency	11	15	0	26
	% within Occupation Status	42.3%	57.7%	0.0%	100.0%
	% within Nationality	9.8%	11.5%	0.0%	10.5%
Self Employed	Frequency	18	55	2	75
	% within Occupation Status	24.0%	73.3%	2.7%	100.0%
	% within Nationality	16.1%	42.0%	50.0%	30.4%
Unemployed	Frequency	32	29	0	61
	% within Occupation Status	52.5%	47.5%	0.0%	100.0%
	% within Nationality	28.6%	22.1%	0.0%	24.7%
Other	Frequency	8	8	1	17
	% within Occupation Status	47.1%	47.1%	5.9%	100.0%
	% within Nationality	7.1%	6.1%	25.0%	6.9%
Total	Frequency	112	131	4	247
	% within Occupation Status	45.3%	53.0%	1.6%	100.0%
	% within Nationality	100.0%	100.0%	100.0%	100.0%

5.5.9 Experience in using a computer by non-users of e-Government

Table 5- 14: Experience in using a computer by non-users of e-Government

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	3.79	112	1.783	.168	-.447	-1.095
Zimbabwe	2.94	131	1.868	.163	.227	-1.547
Other	4.00	4	2.160	1.080	-1.190	1.500
Total	3.34	247	1.876	.119	-.092	-1.498

Table 5-14 revealed that the means procedure of non e-government users' experience with computer usage was relatively moderate; ranging between 2.94 and 4.0. According to the 6 points, the likert scale used to define the experience of computer usage by respondents; likert point number 2 = "less than 6 months" of usage and 4 = "more than 1 year but less than 2 years". Therefore, all mean values obtained for respondents' experience with computer usage for all countries were between 2 and 4 – thus indicating moderate user experience (that is between 6 months and 2 years). Furthermore, Table 5-14 exposed reasonable and relatively acceptable measures of normality as indicated by skewness and kurtosis values within acceptable and recommended ranges of +/-3 (Kim, 2013).

5.5.10 Experience in using a smartphone by non-users of e-Government

Table 5- 15: Experience in using a smartphone by non-users of e-Government

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	3.89	112	1.538	.145	-.664	-.453
Zimbabwe	3.53	131	1.742	.152	-.298	-1.269
Other	3.75	4	2.062	1.031	-.713	1.785
Total	3.70	247	1.660	.106	-.464	-.982

Respondents were asked to reveal their levels of experience with using smartphones. Findings in Table 5-15 discovered respondents for the case study had relatively moderate experience with smartphone usage. This was confirmed by mean values between 3.5 and 3.8. According to the 6 points likert scale used for analysing participants' experience in using smartphones, these mean values obtained indicate that respondents had more than 6 months, but less than 2 years of experience. Further measures of normality exposed realistic and relatively acceptable levels of skewness and kurtosis in-line with Kim (2013). However, the histogram of skewness for all values shown in Table 5-15 had asymmetric tail extending towards the left of the normal distribution graph; but still within acceptable ranges of normality. Similarly, kurtosis values for respondents of 'other' nationalities had a leptokurtic distribution (high peak); whilst for Zambia and Zimbabwe had indicated a platykurtic distribution (flat-topped curve). However, all the kurtosis values were with an acceptable range of normality +/-3 (Kim, 2013).

5.5.11 Frequency of internet use by non-users of e-Government

Table 5- 16: Frequency of internet use by non-users of e-Government

Nationality	Mean	N	Std. Deviation	Std. Error of Mean	Skewness	Kurtosis
Zambia	2.14	112	1.114	.105	.270	-1.428
Zimbabwe	2.02	131	1.137	.099	.512	-1.305
Other	2.75	4	1.500	.750	-.370	-3.901
Total	2.09	247	1.132	.072	.391	-1.382

Van der Meer, Gelders, and Rotthier (2014) suggest that for developing nations, it is a common scenario to discover that a large number of individuals using the internet may not be aware of or using e-government systems. The analysis of means procedure revealed a relatively higher frequency in terms of internet usage as evidenced by higher mean values (Alsaif, 2013), just above 2.0 for all countries (see Table 5-16). According to the 4 points likert scale used to define the frequency of internet usage by respondents; likert point number 2 = "daily" usage and 3 = "once or more times per week". Therefore, all mean values obtained for all the countries were between 2 and 3; indicating a higher frequency of internet use. Moreover, Table 5-16 revealed reasonable and acceptable levels of data normality. This is evidenced by skewness and kurtosis

values falling within the recommended ranges, +/-3 (Kim, 2013). Negative kurtosis values obtained in Table 5-20 indicate a platykurtic distribution (flat-topped curve); however, all values within acceptable data ranges. For skewness, all values were very close to zero, indicating the normal distribution of the responses.

5.5.12 Preferred e-Gov systems by non-users of e-Government

Non-users of e-government systems were asked to indicate services they would prefer to be put online for accessing government services. A wide range of e-government systems pertinent to Zimbabwe and Zambia were listed in the questionnaire (see Appendix 2 and 11) for respondents to tick. A 5 point Likert scale was used for each service ranging from 1 (not important) to 5 (very important). The analysis of means procedure revealed a relatively high frequency in terms of e-government usage as evidenced by the high mean values (ranging from 2.07 for e-tendering and e-procurement systems to 4.38 for those wanting to use electronic application of personal documents like birth certificates, ID, passport at Home Affaires) for all countries. The results revealed reasonable and acceptable levels of normality; i.e. all skewness and kurtosis values were within the +/-3 recommended ranges.

5.6 Chapter Summary

This chapter presented descriptive statistical data analysis for the study to explore the characteristics of quantitative data collected using questionnaires on e-government adoption and utilisation by citizens in the SADC region. The chapter presented an overview of the core procedures undertaken by the researcher of data screening and cleaning to eliminate errors and omissions to ensure accuracy; dealing with missing data in respondents' feedback; dealing with univariate and multivariate normalities before presenting demographic analysis data of e-government users and non- users of e-government systems. This chapter contributes towards answering the research question and objective on the factors that were affecting citizens in their desire to adopt and capacity to use e-government systems.

The overall response rate for this study was very high (92%) and this is considered more than adequate in-line with the recommended acceptable response rate for any survey of 30% by

Alshehri (2012) and Sekaran (2003). Furthermore, the analysis in this chapter dealt with univariate and multivariate normalities to eliminate any data outliers that could distort further advanced data analysis like factor and regression analysis. This was achieved through the assessment of the means of standard deviations, skewness and kurtosis of the entire variable constructs for the study.

The next chapter builds on issues raised in this chapter by performing advanced analysis and calculations; reliability and validity of the data. The chapter will also establish the model fit and suitability of critical variable factors that significantly influence citizens' adoption and utilisation of e-government systems.

Chapter 6: Advanced Statistical Analysis

Chapter Overview

This chapter presents advanced statistical analysis and calculations testing the reliability and validity of the study constructs of the PDEGAUM conceptual model proposed in Figure 3-9 in Chapter 3. Major aspects addressed cover reliability testing, content and construct validity testing, followed by inferential analysis to establish the correlation between the investigated variables. To start with, Pearson's Chi-square test (χ^2) was used for establishing the statistical significance of cross-tabulations. The strength of association between e-government adoption, utilisation, and demographic variables was tested using Phi and Cramer's V. Exploratory factor analysis (EFA) was used to remove duplicated data for the correlated variables and to establish the existence of patterned relationships between measurement scales making up the study constructs. The method of Factor Extraction was used for identifying significant construct variables for inclusion in multiple regression analysis. ANOVA was used for analysing variance and covariance as well as assessing the goodness of Fit of the final study model. Regression and structural equation modelling were used as final analysis to establish the significance of relationships between dependent and independent variables and the model fit.

6.0 Defining e-Government Adoption and Utilisation

E-Government adoption refers to citizens' acceptance of ICTs to access government systems (Ashaye, 2014). Following the cue from Sufna and Fernando (2015), the frequency of e-government use was used as a proxy for e-government system utilisation. As indicated earlier on in Chapter Two and Three of this thesis, the focus of the study is to understand two integral aspects of e-government (adoption and utilisation) in the context of Zambia and Zimbabwe within the SADC region.

In the G2C domain (focal-point of this study) governments in the SADC have to anticipate e-service demand since the majority of e-government systems are not compulsory and determine how citizens make decisions to adopt and utilise such technological innovations. The study postulate that moderator variables such as level of education, experience in using the internet

and computers, and availability of the vernacular language option had an influence on the acceptance and utilisation of e-government systems. Alzahrani (2011) recommend that these variables should be assessed and validated to establish their overall fit into the measurement and structural model (PDEGAUM conceptual framework).

For easier interpretation of results, the adoption and utilisation of e-government variables were split into two as defined in Figure 6-1. In this study e-government adoption and acceptance refers to a citizen's intentions to use any e-government system. Therefore, citizens' behavioural intention (dependent variable) to use is associated with e-government adoption. On the contrary, the frequency of use of e-government systems is used as a proxy measure for measuring e-government utilisation by citizens. For that reason, this study posits that use behaviour (dependent variable) correlates to e-government utilisation.

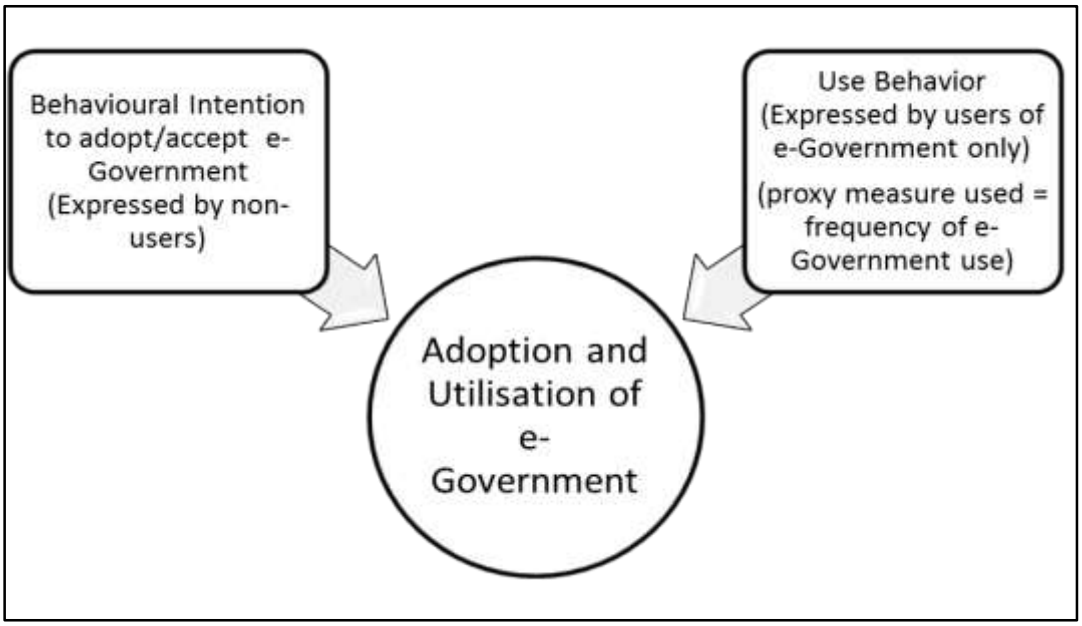


Figure 6- 1: Defining E-Government Adoption and Utilisation

For this reason, the statistical analysis of demographic differences in adoption and utilisation of e-government systems were split into two as follows: demographic differences in e-government adoption/acceptance (non-users) and demographic differences in e-government utilisation (users).

6.1 Effect of moderating factors on e-Government Adoption

The study hypothesised that the intention to use e-government systems was moderated by demographic differences characterising the potential users. In this study citizens' intentions to use e-government systems were associated with their plans for adopting computers and smartphones with internet connectivity which allowed them to access e-government systems. The Pew Research Center (2015:1) suggests that the proliferation of computers and smartphones amongst citizens in developing nations is good news for the adoption and utilisation of e-government systems since most people if create awareness about the existence and benefits of such services, are bound to express some interest. Several demographic attributes were expected to moderate the intention to use e-government systems as outlined in the next section.

Within the quantitative methods spectrum, there are several measures of fitness that could be used to establish the extent to which the collected data fits the proposed model. According to Kenny (2015), measures of the overall fit of the model can be classified into two categories: absolute fit and incremental fit. Absolute-fit measures how well the collected data fit the conceptual model using acceptable threshold values. Typical examples include the Chi-Square Test (χ^2), RMSEA, AGFI and TLI.

In contrast, the incremental fit (comparative fit indices) "evaluates the fit of a user-specified solution in relation to a more restricted, nested baseline model" (Wentzel, 2012:96) and is presented in Section 6.5 of this thesis. A Pearson's Chi-Square Test (χ^2) for the independence of association was conducted for this purpose and the results are presented in sections 6.1 and 6.2.

Since the Pearson's Chi-Square Test (χ^2) is a significant statistic for hypothesis testing in nominal variables, McHugh (2013) recommend that it should be used in conjunction with other strength statistic measures. For that reason, *Phi* and *Cramer's V* tests were used to establish the strength of association between e-government utilisation and demographic variables. According to Kotrlik, Williams and Jabor (2011), the *Phi* measurement should be used to approximate the degree of association in a dichotomous relationship (2 by 2 contingency tables). In addition, Kotrlik et al., (2011:137) posit that the *Cramer's V* coefficient describes the extent of relationship amid categorical variables for any 'contingency table larger than 2 by

2.' For this study, both *Phi* and *Cramer's V* coefficient measurement of association are relevant since both dichotomous relationships and contingency tables greater than 2 by 2 exist for associativity evaluation. A level of significance of '*p*-values < 0.05' both *Phi* and *Cramer's V* coefficient is adopted in this study.

This study adopted Kotrlik's et al., (2011:138) six-degrees of descriptors for measuring and interpreting the *Phi* and *Cramer's V* coefficient scales: negligible-association (0.00 and below 0.10); weak-association (above 0.10 and below 0.20); moderate-association (above 0.20 and below 0.40); relatively-strong-association (above 0.40 and below 0.60); strong-association (above 0.60 and below 0.80) and very-strong-association (above 0.80 and below 1.00). All *Phi* and *Cramer's V* values that fall below 0.20 (negligible to weak associations) in this study were neglected as a weak association. Before the results were accepted, the sample size requirement for a chi-square test for independence was checked for adequacy. The next section uses Pearson's Chi-Square, *Phi* and *Cramer's V* Tests to establish the extent to which the collected data fit the proposed model (demographic variables against 'intention to use' and 'use behaviour' dependent variables).

6.1.1 Chi-Square Test: Level of Education versus Intention

Table 6- 1: Chi-Square Test - level of education versus intention to adopt e-Gov

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	92.902[a]	25	.000
Likelihood Ratio	88.615	25	.000
Linear-by-Linear Association	58.693	1	.000
N of Valid Cases	247		

a. 19 cells (52.8%) have expected count less than 5. The minimum expected count is .03.

Table 6-1 provides the Pearson's Chi-Square Test result for the effect of one's level of education on his/her intention to adopt e-government. The results tell us that '19 cells have expected count less than 5 and the minimum expected count is 0.03'. The sample size requirement for the chi-square test of independence is satisfied. The probability of the chi-

square test statistic ($\chi^2 = 92.902$) was $p = 0.000$, less than the alpha level of significance of 0.05. The supposition holding that differences in the 'intention to use e-government' correlates to differences in 'the level of education' is supported by this analysis. Moreover, values for both *Phi* and *Cramer's V* as shown in Table 6-2 are relatively large and significant (p-values < 0.05) suggesting a strong association between the level of education and intention to use e-government.

Table 6- 2: Phi and Cramer's V Tests for Association for moderating variables of intention to adopt e-government

		Education	Vernacular Language
Nominal by Nominal	*Phi* Value	.613	.576
	Approx. Sig.	.000	.000
	Cramer's V	.274	.332
	Approx. Sig.	.000	.000
N of Valid Cases		247	247

6.1.2 Chi-Square Test: Vernacular language versus intention to adopt

Table 6-3 provides the Chi-Square Test results for the effect of the availability of vernacular language options on e-government systems on citizens' intention to adopt e-government systems. The results tell us that '14 cells have expected count less than 5 and the minimum expected count is 0.29'. Therefore, the sample size requirement for the chi-square test of independence is satisfied. The probability of the chi-square test statistic as presented in Table 6-4 ($\chi^2 = 81.817$) was $p = 0.000$, less than the alpha level of significance of 0.05. The research hypothesis that the 'intention to adopt e-government systems' correlate to the 'availability of vernacular language options' is supported by this analysis. Values for both *Phi* and *Cramer's V* are relatively large and significant (p-values < 0.05), thus suggesting a high strength of association between availability of vernacular language options and citizens' intention to adopt e-government, as shown in Table 6-2.

Table 6- 3: Chi-Square Test results for the availability of vernacular language options versus intention to adopt e-Government

	Value	of	Asymp. Sig. (2-sided)
Pearson Chi-Square	81.817[a]	15	.000
Likelihood Ratio	64.335	15	.000
Linear-by-Linear Association	32.196	1	.000
N of Valid Cases	247		

a. 14 cells (58.3%) have expected count less than 5. The minimum expected count is .29.

6.2 Effect of moderating factors on e-Government Utilisation

This section evaluates various demographic variables against e-government utilisation to establish the significance of any differences and for testing hypothesis.

6.2.1 Chi-Square Test: level of Education versus e-Government utilisation.

Table 6- 4: Chi-Square Test - Level of Education versus e-Government utilisation

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square (χ^2)	98.934[a]	15	.000
Likelihood Ratio	94.447	15	.000
Linear-by-Linear Association	69.871	1	.000
N of Valid Cases	489		

a. 10 cells (41.7%) have expected count less than 5. The minimum expected count is .06.

Table 6-4 provides the result for the effect of one's level of education on the level of usage of e-government systems. The results tell us that '10 cells have expected count less than 5 and the minimum expected count is 0.06'. This indicates that the sample size requirement for the chi-square test of independence is satisfied. In addition, the probability of the chi-square test measurement ($\chi^2 = 98.934$) was $p = 0.000$, less than the alpha level of significance of 0.05. The

supposition that differences in 'e-government utilisation' is related to differences in 'the level of education' is supported by this analysis. Finally, Table 6-5 shows relatively large and significant (p-values = 0.000) values of both *Phi* and *Cramer's V*. This suggests a high strength of association between the level of education and e-government utilisation.

Table 6- 5: Phi and Cramer's V Test for Association for moderating variables of e-Gov utilisation

		Education	Experience in using the internet
Nominal by Nominal	*Phi* Value	.450	.487
	Approx. Sig.	.000	.000
	Cramer's V	.260	.381
	Approx. Sig.	.000	.000
N of Valid Cases		489	489

6.2.2 Chi-Square Test: Experience in using the internet) versus e-Government utilisation

Table 6- 6: Chi-Square Test results for experience in using the internet versus e-Gov utilisation

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	333.285[a]	15	.000
Likelihood Ratio	60.086	15	.000
Linear-by-Linear Association	39.551	1	.000
N of Valid Cases	489		

a. 10 cells (41.7%) have expected count less than 5. The minimum expected count is .65.

Table 6-6 shows the Chi-Square Test results for the effect of experience in using the internet on a user's utilisation levels of e-government system. The results show that '10 cells have expected count less than 5 and the minimum expected count is 0.65'. In this regard, the sample size requirement for the chi-square test of independence is satisfied. The chi-square test value

(χ^2 = 333.285) was p = 0.000, less than the alpha level of significance of 0.05. The research supposition that one's experience in using the internet has a positive effect on their utilisation of e-government systems is supported by this analysis. Table 6-6 presents values for both *Phi* and *Cramer's V* are large and significant (P-values < 0.05).

6.3 Measurement Scale Analysis: Reliability and Validity Analysis

It is a statistical requirement that before any meaningful analysis is made; the identified constructs of the proposed PDEGAUM model need to be interrogated to ensure its validity and unidimensionality (Giannakos, 2014). For this reason, the measurement scales used for assessing adoption and utilisation of e-government were tested for reliability and validity. Alshehri (2012) posit that a reliability measure is concerned with ensuring that research instruments for the study (questionnaires) are free from random errors, have internal consistency and that they have stability. Furthermore, Giannakos, (2014) states that internal consistency relates to the extent to which responses of participants are dependable and steady across construct variables of a single data gathering instrument.

The two dependent scales used in this study are Behavioural Intention and Use Behaviour. Details of such statistical processes and results are given below.

6.3.1 Measuring Internal Consistency associated with users of E-Government (N=489)

Reliability analysis was performed using Cronbach's Alpha (Cronbach, 1951). Reliability is important to any study because in its absence it is impossible to have any validity associated with the scores of the scale. According to Alshehri (2012), high values of Cronbach's Alpha are desirable and signify the reliability of measures. Moreover, Kline (2013) suggested that each construct should have a minimum of three items to overcome technical problems that arise in quantitative data analysis due to few items per construct. Therefore, this study adopts Kline's (2013) recommendation of having a minimum of three variables for all the study constructs. Table 6- 7 shows the number of valid items per each construct after some of them was knocked off due to low reliability.

Hair, Black, Babin and Anderson (2014) have suggested a four-point-likert scale measure of reliability: excellent-reliability (0.90 and below 1.0); high-reliability (0.70 and below 0.90); moderate-reliability (acceptable) (0.50 and below 0.70) and low-reliability (0.50 and below). This study adopts Hair's et al., (2014) recommended Cronbach's Alpha score of above 0.70 (high-reliability) as a true indicator of convergence and anything far below 0.70 was unacceptable and discarded. Findings of this study showed that Cronbach's Alpha values for all variable constructs ranged between 0.679 for Use Behaviour and 0.843 for Social Influence and Habits. However, the Cronbach's Alpha values for Effort Expectancy (0.689) and Use Behaviour (0.679) were returned because they were just very close to the recommended cut-off value (0.70). Overall and in line with Hair et al.'s (2014) recommendation, the Cronbach's Alpha results for this study indicated that the study instrument was reliable with most values above 0.70 – thus indicating proper internal construct-reliability as shown in Table 6-7.

Table 6- 7: Cronbach's Alpha Reliability Results (Item-total correlations) - e-Gov users

Constructs	**No. of valid items**	**Cronbach's Alpha (α)**	**Comments** *(based on Hair's et al., (2014) four degrees of reliability scale)*
Performance Expectancy (PE)	4	0.812	High Reliability
Effort Expectancy (EE)	4	0.689	Moderate Reliability
Social Influence and Habits (SIH)	2	0.843	High Reliability
Privacy, Security and Trust (PST)	6	0.837	High Reliability
Service Quality & Information (SQI)	4	0.798	High Reliability
E-Government Awareness (EA)	3	0.712	High Reliability
Facilitating Condition (FC)	2	0.763	High Reliability
Behavioural Intention (BI)	2	0.823	High Reliability
Use Behaviour (USE)	2	0.679	Moderate Reliability

6.3.2 Validity Analysis using Factor Analysis

Construct validity refers to the appropriateness of a measurement instrument in ensuring that it is effectively evaluating a particular construct(s) being investigated (Mohamad, Sulaimanb, Sern, & Sallehd, 2015). In order to verify construct validity, Factor Analysis was conducted utilising Principal Factor Analysis (PFA) with varimax rotation method. An assessment of validity and unidimensionality of scales was done using Exploratory Factor Analysis (EFA) and an examination of the correlation coefficients for all instrument scales of the PDEGAUM conceptual framework. Papadomichelaki and Mentzas (2012:103) posit that the rule of thumb for using Factor Analysis is that there should be "at least five times as many observations as there are variables to be analysed." The study utilised EFA as a theory generating procedure (rather than theory testing procedure) to determine the number and nature of factors that accounted for the covariation between variables.

Furthermore, the study examines multicollinearity of variables; which entails "…searching for evidence that the variation in one variable coincides with variation in another variable" (Bryman, 2012:339). Albesher (2015) recommends that multicollinearity should always be established since its existence reduces the predictive power of any regression model.
Pallant (2013) suggests that one way to measure multicollinearity is by using the absolute values of Pearson correlation coefficients (r). This value ranges between -1 and 1. Moreover, Cohen (2013) proposed a mechanism to interpret coefficient values: zero (0) indicate a lack of relationship between variables; -1 or 1 implies perfect correlation and suggest that the coefficient value of one variable is obtainable from the analysis of the associated variable being investigated. Finally, Albesher (2015) outlines that when the relationship between two independent variables is $r \geq 0.9$; then it shows the existence of multicollinearity and further analysis is needed before such variables are excluded from the regression analysis.

6.3.2.1 Analysis of Performance Expectancy Scale

Five questionnaires statements were used to assess the effect of performance expectancy (PE) on the utilisation of e-government by citizens. The correlation coefficients matrix calculated for the five items revealed that the correlation coefficients between items were generally greater than 0.3, indicating that they were suitable for factor analysis (Baglin, 2014; Mukaka, 2012). Alshehri (2012) has argued that if the item-total correlation value is below 0.30 it shows that

the variable under investigation is evaluating something entirely dissimilar to the entire construct. Moreover, Young and Pearce (2013) argue that variables that have a large number of the low correlation coefficient (r < +/- .30) should be removed from the analysis as they indicate a lack of patterned relationships. Variable PE5 was therefore removed from the analysis for this reason. Young and Pearce (2013) further argue that correlations that are above r = +/- 0.90 indicate that data may have a problem of multicollinearity. The determinant-score is an additional measure which is used to detect the problem of multicollinearity and should be above the rule of thumb of 0.00001. A determinant-score of 0.245 for PE indicates the absence of multicollinearity (see Appendix 9).

In addition, the researcher has used the Kaiser-Meyer-Olkin (KMO) test (Kaiser, 1974) to evaluate sampling adequacy. KMO assisted in further scrutinising the findings of factor analysis. According to Bai, Hira, and Deshpande (2016), the KMO and Bartlett's tests of sphericity are statistical procedures used to define the factorability of the output matrix. Acceptable KMO statistical measure should generally be greater than 0.50. The KMO statistic for PE was 0.790 and above the minimum acceptable level of 0.50, thus, demonstrating sampling-adequacy.

The Bartlett's test of sphericity was (χ^2 = 684.156), with ($p < 0.001$). Consequently, this demonstrates the existence of adequate relationships among the variables included in this analysis; thus rendering the data suitable for factor analysis as distinct and reliable factors could be produced (see Table 6-8)

This study adopted the recommended factor loading of 0.40 and above to ensure that all variables had practical significance (Yong & Pearce, 2013; Field, 2013; Hair et al., 2006). Factor loading values of all the four PE items exceed the cut-off level (see Appendix 9). To determine the number of factors to retain per construct the Scree-Test results in conjunction with the Eigenvalues as suggested by Field, (2013) and Alsaif (2013) were used. Eigenvalues and scree test (scree plot) are generally used to determine how many factors to retain. Kaiser's criterion; which is a rule of thumb recommends holding all factors which have an eigenvalue value greater than 1 (Kaiser, 1960). Using Kaiser's criterion and the resultant screen test results as depicted in Figure 6-2, it can be discerned that the performance measurement scale has one underlying factor - which in this analysis is performance expectancy.

Table 6- 8: KMO and Bartlett's Test for Performance Expectancy Scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.790
Bartlett's Test of Sphericity	Approx. Chi-Square	684.156
	Df	6
	Sig.	.000

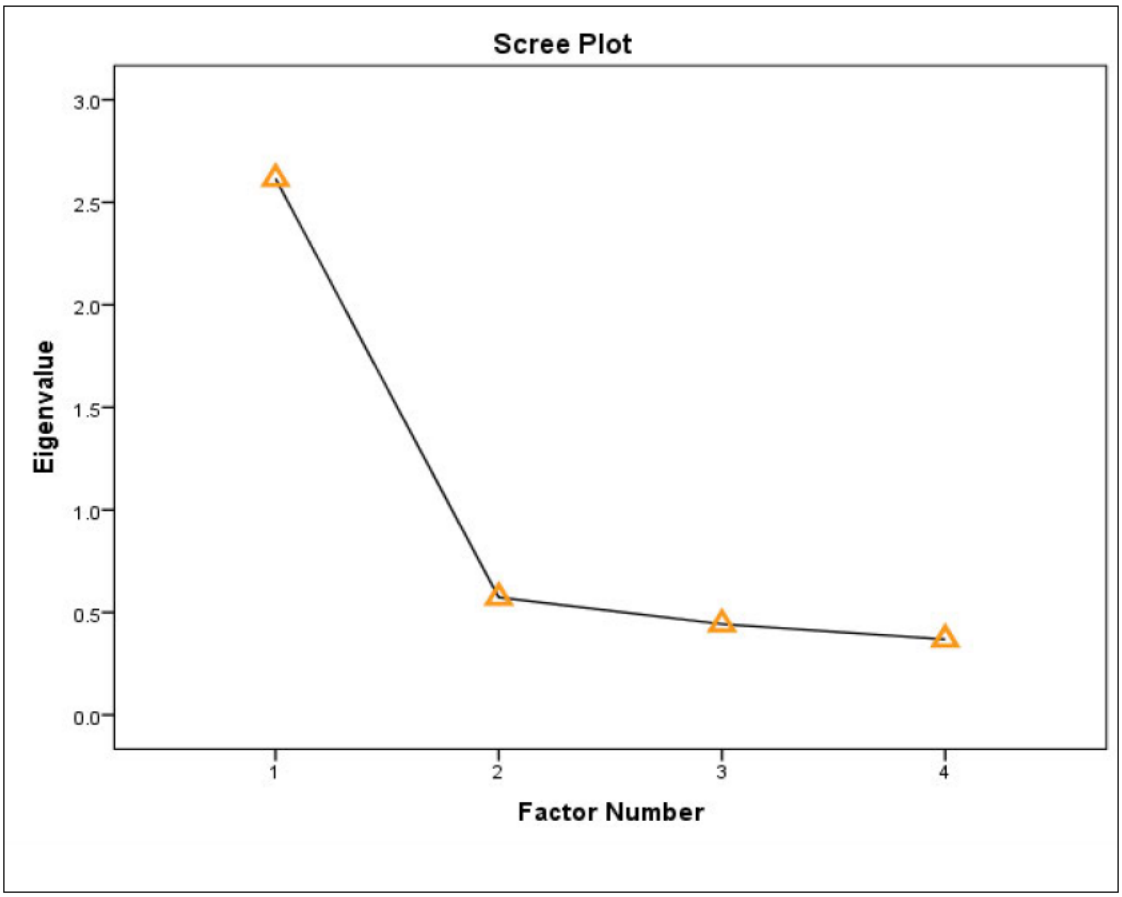


Figure 6- 2: Scree Plot for Performance Expectancy with 1 underlying factor

6.3.2.2 Analysis of Effort Expectancy Scale

Four questionnaires statements were used to assess the effect of effort expectancy on the utilisation of e-government by citizens (see Appendix 7). The correlation coefficient matrix for the four items show that the majority of correlation coefficients between items were generally

greater than 0.3; thus revealing their appropriateness for factor analysis (Hadia, Abdullah & Sentosa, 2016). The computed *determinant score* (i.e. 0.359) was above the rule of thumb of 0.00001, thus indicating the absence of multicollinearity (see Appendix 9). The KMO statistic for Effort Expectancy was 0.604 and the minimum acceptable level of 0.50, indicating sampling adequacy. In addition, Bartlett's test of sphericity was ($\chi^2 = 497.720$), with ($p = 0.000$) – thus indicating adequate relationships among the variables included in this analysis (see Table 6-9). The factor loading values of all four items exceeded the cut-off level of 0.40, at least for factor 1. Figure 6-3 shows a Factor Plot in rotated factor space attempting to extract two factors and was terminated indicating the existence of one factor.

As revealed in Figure 6-3 two variables are grouped highly on factor 1 while the same group is loaded low on factor 2. The size of factor loadings in conjunction with the analysis of eigenvalues and the scree test results justifies the earlier decision to draw one factor – which in this analysis is effort expectancy.

Table 6- 9: KMO and Bartlett's Test for of Effort Expectancy scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.604
Bartlett's Test of Sphericity	Approx. Chi-Square	497.720
	Df	6
	Sig.	.000

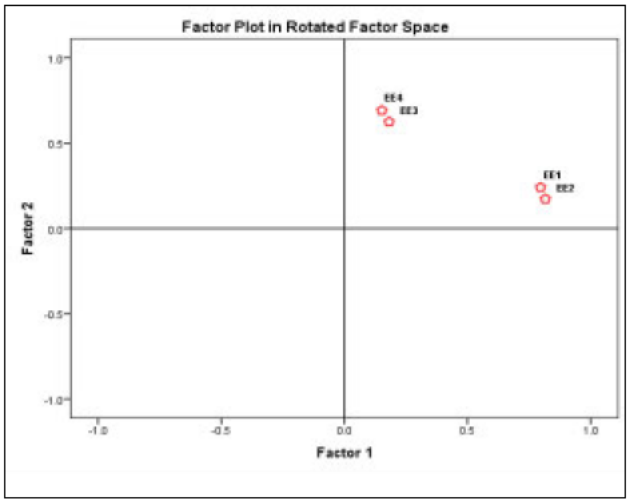


Figure 6- 3: Factor Plot in rotated factor space

6.3.2.3 Analysis of Social Influence and Habits Construct

Four questionnaires statements were used to measure the effect of Social Influence and Habits (SIH) on the utilisation of e-government systems by citizens (Appendix 7). The correlation coefficients matrix for the two items (SIH2 and SIH3) were generally greater than 0.3 and below r = +/- 0.90, thus indicating the absence of the problem of multicollinearity. The computed *determinant score* of 0.468 indicates the absence of multicollinearity (see Appendix 9). Items SIH1 to SIH4 were omitted from further analysis since they did not meet these two minimum screening criteria. As shown in the Table 6-10 the computed KMO statistic is 0.50 ($p < 0.001$), which meets the minimum acceptable level and shows sampling adequacy. In addition, Bartlett's test of sphericity was ($\chi^2 = 369.351$), with ($p < 0.001$) indicating the existence of adequate relationships between the variables included in the analysis. Therefore, it can be concluded that only SIH2 and SIH3 are unidimensional and appropriate for factor analysis as distinct and reliable factors can be produced that depict a patterned relationship. Finally, factor loading values for SIH2 and SIH3 exceed the cut-off level of 0.40 and were loaded, (see Appendix 9).

Table 6- 10: KMO and Bartlett's Test for Social Influence and Habits scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	369.351
	Df	1
	Sig.	.000

6.3.2.4 Analysis of Privacy, Security and Trust Construct

Nine questionnaires statements were used to measure the effect that privacy, security, and trust in citizens' utilisation of e-government systems (Appendix 7). The correlation coefficients matrixes between items were generally greater than 0.3, indicating that they are suitable for factor analysis. Hence the variables were measuring what the construct seeks to measure (Baglin, 2014). The correlations were below r = +/- 0.90 indicating that the data does not have a problem of multicollinearity. The computed *determinant score* (i.e. 0.190), further indicates the absence of multicollinearity (see Appendix 9). The computed KMO statistic is 0.768 (Table 6-11), which reveals sampling adequacy. Moreover, Table 6-11 indicates that Bartlett's test of

sphericity was (χ^2 = 805.772), with (p = 0.000). This indicates the existence of adequate relationships between the variables included in the analysis (Field, 2013). For that reason, it can be concluded that the data is appropriate for factor analysis since distinctive and trustworthy factors can be created. Six items (PST1, PST2, PST3, PST4, PST7 and PST8) with values exceeding the practical cut-off level of 0.40 were loaded (see Appendix 9).

Table 6- 11: KMO and Bartlett's Test for Privacy, Security and Trust Scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.768
Bartlett's Test of Sphericity	Approx. Chi-Square	805.772
	Df	9
	Sig.	.000

6.3.2.5 Analysis of Service Quality and Information scale

Seven variable scales were used to investigate the effect of service quality and information (SQI) of e-government portals on the utilisation of e-government systems by citizens (Appendix 7). The correlation coefficients matrix for the seven items showed that the correlation coefficients between items were generally greater than 0.3, thus indicating their suitability for factor analysis. In addition, the correlations were below r = +/- 0.90 indicating the absence of multicollinearity. Items SQI to SQI3 were excluded from further analysis since they did not meet these two minimum screening criteria. The computed *determinant score* was above the rule of thumb of 0.00001 (i.e. 0.241); which further confirm the absence of multicollinearity (see Appendix 9). The KMO value for SQI was 0.709 and above the minimum acceptable level, thus, indicating sampling adequacy. In addition, Bartlett's test of sphericity was (χ^2 = 691.514), with (p < 0.001) indicating that there were adequate relationships between the variables included in the analysis (see Figure 6-12). Therefore, it was concluded that the data was appropriate for factor analysis as distinct and reliable factors could be produced. The factor loading values of all four items exceeded the practical cut-off level of 0.40 (see Appendix 9).

Table 6- 12: KMO and Bartlett's Test for Service Quality and Information scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.709
Bartlett's Test of Sphericity	Approx. Chi-Square	691.514
	Df	6
	Sig.	.000

6.3.2.5 Analysis of E-Government Awareness scale

Eight major questionnaires statements were used to evaluate the effect of e-government awareness on the utilisation of e-government systems (Appendix 7). The correlation coefficients matrix results for the eight variables revealed that a large number of correlation coefficients between items were generally less than 0.3, which indicates that they were not suitable for factor analysis. In line with Alshehri (2012) and Yong and Pearce's (2013) recommendations, the researcher has the discretion of not removing all variables with low correlation coefficients (as nonexistence of patterned relationships) as further statistical evidence from the anti-correlation matrix table (see Appendix 9) revealed that distinct and reliable factors could be produced from the construct. It is argued generally that if the diagonal element of the anti-correlation matrix that has the 'a*' superscripts* (see Appendix 9) *exceed* the cut-off value of 0.50, and then distinct and reliable factors can still be produced (Yong & Pearce, 2013). This requirement was met and four elements (EA1 – EA4) were extracted.

Furthermore, the correlations shown in Table 6-13 are below r = +/- 0.90, which demonstrate that data did not have the problem of multicollinearity. Finally, the computed *determinant score* was also above the rule of thumb of 0.00001 (i.e. 0.592); thus further substantiating the absence of multicollinearity (see Appendix 9). The computed KMO statistic was 0.659, which is above the minimum acceptable level and demonstrate sampling adequacy. In addition, Bartlett's test of sphericity was (χ^2 = 254.991), with (p = 0.000) (see Figure 6-13), demonstrating adequate relationships between the variables of the awareness construct. Therefore, the four items exceeded the recommended practical cut-off level appropriate for factor analysis and were loaded (see Appendix 9).

Table 6- 13: KMO and Bartlett's Test for e-Government Awareness scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.659
Bartlett's Test of Sphericity	Approx. Chi-Square	254.991
	Df	6
	Sig.	.000

6.3.2.6 Analysis of Facilitating Conditions Scale

Four questionnaires statements (see Appendix 7) were used to assess the effect of facilitating conditions (FC) on the utilisation of e-government by citizens. The correlation coefficients matrix results between the two items (FC2 and FC3) were generally greater than 0.3; thus indicating their suitability for factor analysis. The computed *determinant score* for the Facilitating Conditions scale (0.619) was also above the rule of thumb of 0.00001 indicating the absence of multicollinearity (see Appendix 9).

The KMO value of 0.50 ($p < 0.001$) for the FC met the minimum acceptable level; thus indicating sampling adequacy. Moreover, Bartlett's test of sphericity was ($\chi^2 = 233.013$), with ($p < 0.001$) and substantiated the existence of adequate relationships between the variables involved in this analysis (see Table 6-14). For that reason, two items (FC2 and FC3) with values exceeding the cut-off level of 0.40 were loaded; thus making the facilitating conditions a valid construct (see Appendix 9).

Table 6- 14: KMO and Bartlett's Test for Facilitating Conditions scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	233.013
	Df	1
	Sig.	.000

6.3.2.7 Analysis of Behavioural Intention scale

Three questionnaire statements were used to measure the correlation of behavioural intention to continue using e-government (see Appendix 7). The correlation coefficients matrix results for (BI1 and BI2) were greater than 0.3 and below (r = +/- 0.90), thus suggesting the absence of multicollinearity problems in the data and rendering them suitable for factor analysis. In addition, the *determinant score* for the two items were above the rule of thumb of 0.00001 (i.e. 0.504) - indicating the absence of multicollinearity. Item BI3 was eliminated from the analysis since it could not meet these two screening criteria (see Appendix 9).

The KMO score of 0.504 for the behavioural intention construct showed sampling adequacy. In addition, Bartlett's test of sphericity was (χ^2 = 333.285), with ($p < 0.001$) showing the existence of adequate relationships between the variables contained within this analysis (see Table 6-15). As a result, it can be established that the data was right for factor analysis as different and consistent factors (one factor in this case) was produced depicting patterned relationship. Lastly, the two items (BI1 and BI2) were loaded with values above the cut-off level. Therefore, it can be concluded that the two item-scales measuring behavioural intention are unidimensional and BI is a valid construct as a single factor (see Appendix 9).

Table 6- 15: KMO and Bartlett's Test for Behavioural Intention Scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	333.285
	Df	1
	Sig.	.000

6.3.2.8 Analysis of Use Behaviour (Actual Utilisation) Scale

Three questionnaire statements were used to investigate the actual utilisation of e-government systems by citizens (see Appendix 7). The correlation coefficients matrix for the two items (USE1 and USE2) revealed that they were greater than 0.3; whilst USE3 was below this cut off point and was dropped. The correlations between the two variables were below *r* = +/- 0.90, indicating that the absence of multicollinearity problem in the data.

The computed determinant-score (i.e. 0.838) was also above the rule of thumb of 0.00001, thus further indicating the absence of multicollinearity (see Appendix 9). The computed KMO analysis was 0.50 ($p < 0.001$) which met the minimum acceptable level. This indicates sampling adequacy for the construct. In addition, Bartlett's test of sphericity for the construct was ($\chi^2 = 85.921$), with ($p < 0.001$) indicating that there were adequate relationships between the variables included in the analysis (see Table 6-16). For that reason, it can be concluded that the data was appropriate for factor analysis. Thus, two items (USE1 and USE2) were loaded with values exceeding the cut-off level of 0.40, making the Use Behaviour a valid construct with unidimensional item scale (see Appendix 9).

Table 6- 16: KMO and Bartlett's Test for Use Behaviour (Actual Utilisation) Scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	85.921
	Df	1
	Sig.	.000

6.3.3 Measuring Internal Consistency - non-users of e-Gov (N = 247)

6.3.3.1 Cronbach's Alpha Reliability Results (Item-total correlations) – e-Gov non-users

Table 6-17 provides an analysis of the internal consistency reliability for the six construct scales used to evaluate citizens' intention to adopt e-government systems. Findings of this study showed that Cronbach's Alpha values for all the constructs ranged between 0.694 for Facilitation Condition (FCn) and 0.811 for Behavioural Intention (BIn). Overall and in line with Hair's et al. (2014) recommendation, the Cronbach's Alpha results for this study indicated that the study instrument was reliable with five constructs having their values above 0.70 – thus indicating proper internal construct-reliability. However, the only exception was Facilitation Conditions (0.694). The researcher decided to retain the FCn construct since its alpha value was very close to the recommended minimum value of 0.70.

Table 6- 17: Cronbach's Alpha Results: non-users of e-Government systems

Constructs	**No. of Items**	**Cronbach's Alpha (α)**	**Comments** *(based on Hair's et al., (2014) four degrees of reliability scale)*
Effort Expectancy (EEn)	2	0.720	High Reliability
Facilitation Condition (FCn)	2	0.694	Moderate Reliability
Privacy, Security and Trust (PSTn)	3	0.715	High Reliability
Price Value (PVn)	3	0.726	High Reliability
E-Government Awareness (EAn)	2	0.708	High Reliability
Behavioural Intention (BIn)	2	0.811	High Reliability

"**n**" after every construct variable indicates that the construct is associated with non-users of e-Gov/ Behavioural intention to adopt dependent variable

6.3.3.2 Analysis of Effort Expectancy (EEn) Scale

Three questionnaire statements were used to evaluate the effect of effort expectancy on citizens' intention to adopt e-government systems (see Appendix 7). The correlation coefficients matrix for the two items revealed coefficients less than 0.3, which indicates that they are not suitable for factor analysis as they indicated lack of patterned relationship (Baglin, 2014). However, the *determinant score* was above the rule of thumb of 0.00001 (i.e. 0.94) indicating the absence of multicollinearity (see Appendix 9). The KMO statistics score of 0.50 for the EE met the minimum acceptable level of 0.5, but it is not significant (p = 0.223). Bartlett's test of sphericity ($\chi^2 = 1.488$), with ($p > 0.05$) indicates that there were inadequate relationships between the variables included in the analysis (see Table 6-18). Furthermore, factor loading values for the two items (EEn1 and EEn2) did not exceed the cut-off level of 0.40 (Yong & Pearce, 2013) - thus making Effort Expectancy an invalid construct as a single factor (see Appendix 9).

6.3.3.3 Analysis of Facilitating Conditions (FCn) Scale

The Facilitating Conditions construct used three questionnaire statements to evaluate the impact of facilitating conditions on citizens' intention to adopt e-government systems (see

Appendix 7). Results showed that the correlation coefficients between the two items (FCn1 and FCn2) were greater than 0.3, which indicated that they were suitable for factor analysis.

Table 6- 18: KMO and Bartlett's Test for Effort Expectancy scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	1.488
	Df	1
	Sig.	.223

Because item FCn3 generated correlations less than 0.3; resulting in un-patterned relationships, it was discarded. The correlations for FCn1 and FCn2 were below r = +/- 0.90, indicating that the data did not have the problem of multicollinearity. The *determinant score* for FC was above the rule of thumb of 0.00001 (i.e. 0.869) indicating the absence of multicollinearity (see Appendix 9). The computed KMO statistic was 0.50 ($p < 0.001$), meeting the minimum acceptable level of 0.5 and thus indicating sampling adequacy. Also, Bartlett's test of sphericity was ($\chi^2 = 34.329$), with ($p < 0.001$) indicating that there were adequate relationships between the variables included in this analysis (see Table 6-19). Therefore, it can be concluded that the data was appropriate for factor analysis as distinct and reliable factors could be produced that depicted patterned relationship. The factor loading values of all the two items exceed the cut-off level of 0.40 making the Facilitating Conditions a valid construct (see Appendix 9).

Table 6- 19: KMO and Bartlett's Test for Facilitating Conditions scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	34.329
	Df	1
	Sig.	.000

6.3.3.4 Analysis of Privacy, Security, and Trust (PSTn) Scale

Three questionnaire statements were used to study the effect of Privacy, Security and Trust (PSTn) on citizens' intention to adopt e-government systems (see Appendix 7). The correlation

coefficients matrix results for PSTn items were generally less than 0.3 and this indicated that they were not suitable for factor analysis. Additional analysis however from anti-image correlation table (see Appendix 9 revealed that diagonal element of the anti-correlation matrix that has the **'a'** superscript is above the cut-off value of 0.50. Meeting this minimum requirement means distinct and reliable factors could be produced (Yong & Pearce, 2013). The correlations depicted were however below r = +/- 0.90 indicating that the data did not have a problem of multicollinearity. The computed *determinant score* was above the rule of thumb of 0.00001 (i.e. 0.939) indicating the absence of multicollinearity (see Appendix 9).

Moreover, the KMO statistic of 0.557 ($p < 0.005$) met the minimum acceptable level of 0.5. In addition, Bartlett's test of sphericity was ($\chi^2 = 15.316$), with ($p < 0.005$) indicating that there were adequate relationships between the variables included in the analysis (see Table 6-20). Therefore, the data is suitable for factor analysis as distinctive and reliable factors can be produced that depict a patterned relationship. Finally, factor loading values for the three items were examined and item PSTn2 did not exceed the recommended cut-off level of 0.40 – thus leaving the Privacy, Security and Trust construct a valid construct with only two items (PSTn1 and PSTn3) to consider for further analysis (see Appendix 9).

Table 6- 20: KMO and Bartlett's Test for Privacy, Security and Trust scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.557
Bartlett's Test of Sphericity	Approx. Chi-Square	15.316
	Df	3
	Sig.	.002

6.3.3.5 Analysis of Price Value Scale

The Price Value (PVn) construct used four questionnaires statements to measure the effect of the price value of data bundles and ICT devices on citizens' intention to adopt e-government systems (see Appendix 7). The correlation coefficients matrix for (PVn2, PVn3 and PVn4) revealed that a large number of correlation coefficients between items were generally greater than 0.3 and below r = +/- 0.90, thus indicating that the data did not have a problem of

multicollinearity and were suitable for factor analysis. Moreover, the *determinant scores* (i.e. 0.445), above the rule of thumb showed the absence of multicollinearity (see Appendix 9). Complementary evidence from the KMO statistics (KMO = 0.691) showed that the chosen sample was adequate to warrant the extraction of distinct and reliable factors. In addition, Bartlett's test of sphericity was (χ^2 = 197.825), with (p = 0.000) indicating that there were adequate relationships between the variables included in the analysis (see Table 6-21). Therefore, it can be concluded that the data is appropriate for factor analysis as distinct and reliable factors could be produced. The factor loading values of all three items exceeded the practical cut-off level of 0.40. This makes the Price Value a valid construct for regression analysis (see Appendix 9).

Table 6- 21: KMO and Bartlett's Test for Price Value scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.691
Bartlett's Test of Sphericity	Approx. Chi-Square	197.825
	Df	3
	Sig.	.000

6.3.3.6 Analysis of E-Government Awareness Scale

Three questionnaire statements were used to assess the effect of citizens' awareness of e-government on their intentions to adopt such systems (see Appendix 7). The correlation coefficients matrix results for EAn revealed that the correlation coefficients between the two items (EAn2 and EAn3) were greater than 0.3 and below r = +/- 0.90, which indicates that they were suitable for factor analysis. Item EAn1 was discarded for not meeting this criterion. The computed *determinant score* of EA2 and EAw3 (i.e. 0. 609) is acceptable and showed the absence of multicollinearity (see Appendix 9. Also, the KMO test value was 0.681 ($p < 0.001$), which meets the minimum acceptable level of 0.5, indicating sampling adequacy. In addition, Bartlett's test of sphericity was (χ^2 = 121.302), with ($p < 0.001$) indicating that there were adequate relationships between the variables included in the analysis (see Table 6-22). Therefore, it can be established that the data was appropriate for factor analysis as distinct and reliable factors. Furthermore, it was established that the two measurement scales of e-

government awareness construct were unidimensional. Lastly, factor loading values for the two items exceed the cut-off level of 0.40 and make the e-government awareness a valid construct (see Appendix 9).

Table 6- 22: KMO and Bartlett's Test for E-Government Awareness scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		. 681
Bartlett's Test of Sphericity	Approx. Chi-Square	121.302
	Df	1
	Sig.	.000

6.3.3.7 Analysis of Behavioural Intention (BIn) Scale

Three questionnaires statements were used to study the influence of Behavioural Intention on e-government adoption (see Appendix 7). Through EFA the correlation coefficients matrix was calculated for the two items (BIn1 and BIn2) and the results revealed that the coefficients between items were greater than 0.3 and below r = +/- 0.90, indicating that they were suitable for factor analysis and that the data did not have a problem of multicollinearity. An acceptable *determinant score* of 0.445 indicates the absence of multicollinearity (see Appendix 9. KMO test statistic was 0.691, indicate sampling adequacy and that the chosen sample is adequate to warrant the extraction of distinct and reliable factors. In addition, Bartlett's test of sphericity (χ^2 = 197.825) with (p = 0.000) (see Table 23) indicate that there were adequate relationships between the variables included in the analysis. Hence the data was appropriate for factor analysis as distinct and reliable factors can be produced. BIn1 and BIn2 were all loaded for factor analysis as they exceeded the practical cut-off level of 0.40, thus making behavioural intention a valid construct (see Appendix 9.

Table 6- 23: KMO and Bartlett's Test for Behavioural Intention scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.681
Bartlett's Test of Sphericity	Approx. Chi-Square	289.584
	Df	2
	Sig.	.000

6.4 Regression Analysis: E-Government Users

Overall, 489 e-government users (cases) were analysed. Regression analysis was used to test the relationship between the use behaviour dependent variable and several predictor variables. Regression analysis was selected as an appropriate statistical procedure for investigating the factors that influenced the utilisation of e-government systems by citizens in Zimbabwe and Zambia. Estimating the residual relationship between one dependent variable with one or more independent variables is the key assumption of regression analysis (Field, 2013). It is argued that "the residual scatter's plot provides a test of the assumptions of normality, linearity, and homoscedasticity between predicted dependent variable scores and errors of prediction" (Tabachnik & Fidell, 2013:119). In statistical terms, the residual refers to the difference between obtained and predicted dependent variables. For such reason and its usefulness, the residual was plotted, which reveals a straight line relationship with a normal distribution of dependent variable scores, and the variance of the residual is the same for all the predicted scores.

6.4.1 Regression Analysis: Dependent variable – Use behaviour

This study hypothesised that the user behaviour dependent variable correlates with the facilitating conditions; effort expectancy; e-government awareness; service quality and information; privacy, security and trust; intention to use, and usage dependent variables. In this study use behaviour was defined as the continuous usage of e-government services by citizens. A correlation matrix was first computed to depict relationships between independent variables likely to compromise the explanatory power of the overall model.

Variables (SQI4; PE1,3-4; EE3-4; EA1,3; BI2 and PST2-3, PST5-7) were removed from the analysis as they posed problems of compromising the predictive power of the model (owing to high correlation values between them and other variables) (see Appendix 10). According to Albesher (2015), the problem of multicollinearity between any two independent variables exists when the correlation coefficient (r) value is equal to or above 0.90. The correlation coefficients, significant at 0.05 level (2-tailed) ranged between -0.055 to 0.731. Therefore, the findings of this study confirm the absence of the problem of multicollinearity.

The incremental fit measure *R Square* (usually written as R^2) denotes the ratio of the difference in the response variable and adopts the null model to compare the study results against the hypothesised/baseline model (Alexopoulos, 2010; Al-Shafi, 2009). The higher the value of R^2 (closer to 1), the better is the evidence of good-fit of the tested model. To assess the incremental fit, this study had adopted the R^2 measure in the regression model to discover the magnitudes of disparities in the participants' response variables. Values for R^2 always lie between (0) and (1). Results of this study revealed that the independent variables explain 18.3 percent of the dependent variable (use behaviour) with R-Square equal to 0.183, and to which this result made a significant contribution (see Table 6-24).

The ANOVA test (Table 6-25) confirmed that the model is significantly better at predicting the outcome than the mean (best fit of the model) with F = 11.072 as the improvement ratio when predicting the outcome with p-value equalling 0.000 ($p < 0$ .05). The relationship between the dependent variable, which is use behaviour of the government system and the independent variables, was revealed through the β-value and the level of significance of the T-test values (Table 6-26). A significant relationship between the intentions to use associated with computer usage and the user behaviour was confirmed by this model with β-value equal to 0.311 with ($p < 0.05$). Other construct variables that were found to have a positive effect on citizens' use behaviour of e-government systems were PST1, PST4, PST8, EA2, EA4, EE1, EE2, SQI5, SIH2, BI1 and USE1; at $p < 0.05$. Furthermore, Table 6-26 indicate that both facilitating conditions and service quality and information variables were however found to have no correlation with the user behaviour dependent variable.

Table 6- 24: Regression Analyses - Use Behaviour Model Summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.428[a]	.183	.161	.557	.183	11.072	17	482	.000

a. Predictors: (Constant), SQI7, FC3, BI1, SQI6, PST1, PST4, PST8, FC2, SQI5, EA2, EA4, EE1, EE2, USE1, SIH2, SIH3, PE2

Table 6- 25: Regression Analysis - e-Government Use Behaviour ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.603	17	3.434	11.072	.000[b]
	Residual	149.487	482	.310		
	Total	170.090	488			

a. Dependent Variable: USE

b. Predictors: (Constant), SQI7, FC3, BI1, SQI6, PST1, PST4, PST8, FC2, SQI5, EA2, EA4, EE1, EE2, USE1, SIH2, SIH3, PE2

No correlation was supported by the findings of the Performance Expectancy and Facilitating Conditions variables. As shown in Table 6-26, all these two predictor variables on citizens' use behaviour of e-government have their significance levels ranging from (p-value = 0.521) for FC3 to (p-value = 0.756) for PE2 – thus not significant at (p<.05) level. In the context of developing countries; especially in the SADC region (with Zimbabwe and Zambia being the subjects) where the digital divide is common (Bwalya & Mutula, 2014) even in cities, could suggest that governments are not giving enough support to citizens to encourage the use of e-services. Moreover, the high cost of internet access may be a prohibiting factor to lack of use. Furthermore, local travelling costs for urban dwellers, as opposed to those travelling long distances to urban areas for accessing services, could be another factor contributing to the performance expectancy was not a significant factor for them.

Table 6- 26: Regression Analysis Coefficients of independent variables of Use Behaviour[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta (β)			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.530	.222		15.899	.000					
	BI1	.161	.023	.311	6.892	.000	.333	.300	.294	.093	5.120
	FC2	.007	.041	.010	.175	.861	.046	.008	.007	.509	1.642
	FC3	-.027	.042	-.035	-.643	.521	.037	-.029	-.027	.502	1.660
	PST1	.432	.043	.446	5.747	.000	.321	.297	.290	.494	4.026
	PST4	.182	.041	.197	2.948	.003	.256	.248	.239	.002	1.993
	PST8	.339	.041	.354	3.748	.000	.283	.277	.271	.014	2.628
	SQI5	.312	.036	.297	2.479	.001	.275	.267	.263	.428	2.336
	SQI6	.016	.034	.031	.482	.630	-.113	.022	.021	.448	2.230
	SQI7	-.026	.031	-.041	-.849	.396	-.116	-.039	-.036	.501	1.248
	EA2	.086	.031	.123	2.766	.002	.246	.232	.227	.012	1.096
	EA4	.059	.043	.113	.314	.009	.321	.298	.285	.035	1.070
	EE1	.276	.067	.244	4.120	.000	.377	.186	.171	.092	2.032
	EE2	.206	.066	.183	3.118	.002	.357	.142	.129	.099	2.004
	PE2	-.022	.070	-.013	-.311	.756	.040	-.014	-.013	.638	1.066
	SIH2	.283	.042	.261	4.256	.000	.316	.139	.128	.432	2.316
	SIH3	.073	.067	.052	.192	.955	.087	.009	.008	.451	2.216
	USE1	.307	.045	.320	6.795	.000	.381	.218	.396	.033	5.365

a. Dependent Variable: USE

As indicated earlier in this chapter, the presence of multicollinearity between variables adversely disturbs the predictability of any regression model (Winship & Western, 2016). IBM SPSS package offers two diagnostic factors to detect multicollinearity: the *tolerance* and *variance inflation factor* (VIF). The tolerance factor "measures the correlation between the predictor variables" and varies between (0) and (1) (Al-Shafi, 2009:164). The rule of thumb, according to Al-Shafi (2009) is that the closer the tolerance factor is to (0), the more robust is the association between the investigated variable with the rest of the studied variables. In-line with tolerance factor for use behaviour of e-government systems, the results of this study, as presented in Table 6-26 generally shows stronger relationships with all values within the recommended range.

According to Morrow (2011:1), VIF "indicates the magnitude of the inflation in the standard errors associated with a particular beta weight that is due to multicollinearity." In addition, Myers (1990) suggests that VIF values should range between 1 and 10. Any values outside this range indicate the problem of multicollinearity. Moreover, Myers (1990) has proposed a three-degree measurement scale to interpret VIF values: VIF = 1 (no correlation); 1 < VIF < 5 (moderately-correlated) and VIF > 5 to 10 (highly-correlated). As presented in Table 6-26, VIF values for use behaviour of e-government systems varies from 1.066 for PE2 to 5.365 for USE1 (i.e. all ranging from moderately correlated to highly correlated).

6.4.2 Regression Analysis: Dependent variable –Behavioural Intention

A total of 247 non-users of e-government system (cases) were analysed. Regression analysis was used to test the relationship between the behavioural intention dependent variable and the independent variables (e-Government Awareness, Price Value, Facilitating Conditions; and Privacy, Security and Trust). Two variables (EEn1 and PSTn2) were knocked out of the analysis as they were compromising the predictive power of the model (owing to high correlation values between them and other variables). The correlation coefficients (r) values, significant at 0.05 levels (2-tailed), ranged from -0.687 to 0.737 (see Appendix 10). Therefore, the findings confirm the absence of the problem of multicollinearity in this study. Regression tests, as shown in Table 6-27 revealed that the model of independent variables explained about

46% percent of the variance in the dependent variable with R-square equal to 0.457, and to which this result made a significant contribution equalling 0.000 ($p < 0.05$).

The ANOVA test, as presented in Table 6-28 confirmed that the model is significantly better at predicting the outcome than the mean (best fit of the model) with F = 28.722 as the improvement ratio when predicting the outcome and with a significant value equalling 0.000 ($p < 0.05$). The relationship between the dependent variable, which is behavioural intention to adopt e-government and the independent variables (FCn, PSTn, PVn, EAn), was revealed through the β-value and the significance of the T-test at ($p < 0.05$) (Table 6-29). A negative (β = -0.390) and significant relationship ($p < 0.01$) between lack of relevant skills and the intention to use e-government was discerned. Results indicate that the intention to use e-government was significantly constrained by lack of relevant skills. A significant relationship ($P < 0.05$) between lack of security and intention to use e-government was also established with (β = 0.443). Such results revealed that a considerable number of citizens had no intention to use e-government fearing security-related issues. Also, a positive (β = 0.197) and significant association between intention to use e-government and unallowable ICT infrastructure were discerned. Results revealed that a significant proportion of citizens were unable to use e-government owing to the high price associated with procuring ICT facilities. Related findings, as shown in Table 6-29 revealed a negative (β = -0.114) and non-significant relationship ($p > 0.05$) between the non-availability of ICT infrastructure facilities (such as computers, smartphones, tablets, personalised assistance among others) and the intention to use e-government.

Awareness of e-Government was also found to have a significant effect ($p < 0.05$) in explaining the behavioural intention of non-users of e-government as indicated by a negative (β = -0.169). Such results indicate that citizens were failing to use e-government because of lack of knowledge of the existence of e-government systems and access to ICT facilities.

In-line with tolerance factor for citizens' behavioural intention to use e-government systems, the results of this study, as presented in Table 6-29 generally shows stronger relationships with all values within the recommended range (Al-Shafi, 2009). The tolerance factor ranged between 0.098 (FCn1) and 0.969 (EAn2). Additional analysis of the variance inflation factor, as presented in Table 6-29, shows that all the VIF values of behavioural intention to use e-government system ranged from 1.032 for EAn2 to 5.120 for BIn2 (i.e. being moderately correlated to highly correlated).

Table 6- 27: Regression Analysis of Behavioural Intention to use e-Government

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.676[a]	.457	.441	1.241	.457	28.722	8	239	.000

a. Predictors: (Constant), EAn2, EAn3, FCn1, PSTn1, FCn2, PVn2, BIn1, Bin2.

Table 6- 28: Regression Analysis - Behavioural Intention to use e-Government ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	309.871	8	44.267	28.722	.000[b]
	Residual	368.356	239	1.541		
	Total	678.227	246			

a. Dependent Variable: BIn

b. Predictors: (Constant), EAn2, EAn3, FCn1, PSTn1, FCn2, PVn2, BIn1, Bin2.

Table 6- 29: Regression Analysis Coefficients of independent variables of Behavioural Intention[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta (β)			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	6.287	.763		8.238	.000					
	FCn1	-1.294	.188	-.390	-6.875	.000	-.589	-.406	-.328	.098	4.413
	PVn2	-.671	.202	-.197	3.323	.001	-.501	-.210	-.158	.146	3.548
	PSTn1	.443	.169	.134	2.615	.009	.342	.167	.125	.170	2.149
	FCn2	-.186	.101	-.114	-1.832	.068	-.452	-.118	-.087	.592	1.690
	EAn2	.108	.347	.015	.310	.757	.055	.020	.015	.969	1.032
	EAn3	-.253	.190	-.169	-2.331	.018	-.231	-.086	-.063	.154	2.171
	BIn1	.008	.034	.014	.242	.809	.195	.108	.092	.669	1.532
	BIn2	.161	.023	.311	6.892	.000	.333	.300	.294	.083	5.120

a. Dependent Variable: BIn

6.5 Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) is a powerful technique used to analyse the entire model at once using a series of equations, identical to multiple regression equations; but focused on scrutinising the structure of interrelationships between latent construct variables and testing the hypotheses (Albesher, 2015). In this study, SEM was done to increase the precision and reliability of the findings of this study by treating all constructs as independent entities and allowing them to correlate with each other freely. In SEM, the rule is that all indicators (measured items) should only load on one construct. Alshehri (2013) suggest the use of SEM as a multivariate technique used for testing theoretical models involving causal relationships between the investigated variables and usually consists of the measurement and structural models.

In this study, IBM AMOS 24 was used to test the proposed PDEGAUM framework using SEM techniques. The SEM commenced by conducting a Confirmatory Factor Analysis (CFA) to establish the measurement model and to determine how the model fits the collected data. This is an essential step in SEM because the empirical data should provide an acceptable fit to the proposed conceptual model (Hair et al., 2014).

6.5.1 Confirmatory Factor Analysis

In this study, Confirmatory Factor Analysis (CFA) was also used for testing the discriminant and convergent validity of the measurement scales. Hair et al., (2014) recommends three tests for evaluating convergent validity in SEM which are Standardised Factor Loadings (SFL) also called Standardized Regression Weights (SRW), Construct Reliability (CL) and Average Variance Factor (AVF).

6.5.1.1 Convergent Validity

The Standardised Loadings or Regression Weights (SRW) shows the level of association between scale items and an individual latent variable. Yong and Pearce (2013) recommend that the standardised regression weights should range between -1.0 and +1.0; and that the minimum

acceptable value for loadings should be 0.50 (Hair et al., 2014). Only valid SRW meeting the minimum rule of thumb were presented in Table 6-30 and Table 6-31. Construct reliability was done to ensure that latent variables of each construct were internally consistent. As indicated in Table 6-30, the reliability coefficients of all the constructs for the e-government users ranged between 0.774 and 0.874. Therefore, the results demonstrate that the constructs were internally consistent since all of them were above the widely accepted minimum level of 0.70 (Hair et al., 2014). Similarly, the constructs used for the non-users of e-government (Table 6-31) ranged from 0.714 to 0.823 – thus indicating that the constructs are internally consistent.

The Average Variance Extracted (AVE) "measures the level of variance captured by a construct versus the level due to measurement error, values above 0.70 are considered very good, whereas, the level of 0.50 is acceptable" (Alarcon & Sanchez, 2015: 5). The AVE values for this study for e-government users ranged from 0.527 to 0.733 - thus surpassing the minimum recommended threshold of 0.50. All AVE values for the constructs used for the non-users of e-government (Table 6-31) were above the minimum acceptable level of 0.50 (i.e. ranging from 0.555 to 0.700). Therefore, based on the values obtained in Tables 6-30 and Table 6-31 for the standardised regression weights, construct reliability and average variance extracted, it can be discerned that the results confirmed the convergent validity of the constructs of the measurement model.

Table 6- 30: Construct Reliability and Average Variance Extracted (AVE): e-Gov users (N = 489)

Construct Items	**Standardized Loadings**	**Construct Reliability**	**AVE**
Significant Level	≥ .50	≥ .70	≥ .50
Performance Expectancy (PE)		.815	.527
PE1	.79		
PE2	.80		
PE3	.63		
PE4	.67		
Effort Expectancy (EE)		.816	.689
EE1	.83		
EE2	.83		

(continues)

Social Influence and Habits (SIH)		.846	.733
SIH2	.90		
SIH3	.81		
Privacy, Security and Trust (PST)		.853	.595
PST1	.79		
PST2	.88		
PST3	.69		
PST4	.71		
Service Quality and Information (SQI)		.874	.636
SQI4	.73		
SQI5	.88		
SQI6	.82		
SQI7	.75		
E-Government Awareness (EA)		.844	.646
EA1	.91		
EA2	.73		
EA3	.76		
Facilitating Conditions (FC)		.774	.636
FC2	.68		
FC3	.90		
Behavioural Intention (BI)		.801	.670
BI1	.89		
BI2	.74		
E-Government Use Behaviour (USE)		.832	.555
USE2	.70		
Exp	.69		
Edu	.74		

Table 6- 31: Construct Reliability and Average Variance Extracted (AVE): non-users of e-Gov (N = 247)

Construct Items	Standardised Regression Weights	Construct Reliability	AVE
Significant Level	≥ .50	≥ .70	≥ .50
Privacy, Security and Trust (PSTn)		.714	.555
PSTn1	.73		
PSTn3	.76		
E-Government Awareness (EAn)		.778	.639
EAn2	.71		
EAn3	.88		
Facilitating Conditions (FCn)		.715	.557
FCn1	.79		
FCn2	.70		
Price Value (PVn)		.823	.700
PVn2	.78		
PVn4	.89		
Behavioural Intention (BIn)		.714	.555
BIn1	.74		
BIn2	.75		

6.5.1.2 Discriminant Validity

Discriminant validity (DV) is a crucial building block for model evaluation which is carried out to establish and ensure that each construct of the study instrument is empirically unique from the rest of the other constructs and characterises phenomena of interest in the structural equation model (Hair et al. 2014). AlKhatib (2013:276) suggest a rigorous method for computing discriminant validity in which the "absolute values of correlations between the constructs" are compared with the square root of the AVE for that specific construct. The rule of thumb according to AlKhatib (2013) is that the square root of the AVE for that specific

construct should always be greater than the AVE and all the correlations with all the other constructs.

As illustrated in Table 6- 32 and Table 6-33, the square roots (shaded in grey colour) were greater than the associated correlations for all the other constructs; thus there were no concerns with the discriminant validity. Based on the obtained results, it can be deduced that CFA results provided acceptable discriminant and convergent validity for the construct scales of the questionnaire.

Table 6- 32: Standardized Construct Correlation Matrix- E-Government users

	SIH	FC	BI	PE	EE	PST	SQI	EA	USE
SIH	.86								
FC	-.058	.80							
BI	.149**	-.180**	.82						
PE	.008	.252**	.099*	.73					
EE	.154**	-.068	.455**	.223**	.83				
PST	.380**	-.195**	.150**	-.104*	.086	.77			
SQI	.277**	-.112*	.247**	.088	.365**	.341**	.80		
EA	.257**	-.010	.106*	.005	.168**	.182**	.211**	.80	
USE	.124**	-.087	.261**	.027	.104*	.131**	.104*	.039	.74

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

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

NB. Diagonal values in grey boxes show the Square Roots of AVE for each construct; all values below this diagonal line are correlation estimates for the constructs.

Table 6- 33: Standardised Construct Correlation Matrix, non- users of e-Government

	FCn	PSTn	PVn	EAn	Bin
FCn	.75				
PSTn	-.303**	.74			
PVn	.639**	-.283**	.84		
EAn	.280**	-.147*	.330**	.80	
BIn	-.569**	.405**	-.544**	-.277**	.74

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

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

NB. Diagonal values in grey boxes show the Square Roots of AVE for each construct; all values below this diagonal line are correlation estimates for the constructs.

6.5.2 Structural Model Analysis – Testing the Hypotheses

Assessment of the structural model is the last stage of the SEM decision-making process which is achieved by comparing the confirmatory factor analysis model fit with the structural model fit. This process assists in determining the extent to which the fit indices obtained in the CFA model have improved in the structural model after several iterations (Albesher, 2015; Hooper, Coughlan & Mullen, 2008).

Hair et al. (2014) suggest that the value of χ^2 obtained in the recursive structural model should always be greater than that obtained in the CFA model since no further relationships between constructs can be deduced in the final structural model. For that reason, if the value obtained for the structural model fit index is lower than that obtained for the CFA model, then the results show a lack of validity (Hair et al., 2014). Before running and establishing the model fit, the researcher laid out the nature and extent of associations between various latent constructs (either exogenous or endogenous). Exogenous constructs are associated with exogenous variables which show the association (using either single or double-headed arrow) between latent constructs. Table 6-34 shows the 17 hypotheses testing paths used to test the associations between latent constructs of the model.

Table 6- 34: Hypotheses Testing Associations

Construct Code	Construct	Hypotheses	Statistically Significant Hypothesised Associations (+/-)
EDU	Level of Education	H1(a0) & H1(a1) H1(b0) & H1(b1)	EDU → BI EDU → USE
EXP	Experience of use	H1(c0) & H1(c1)	EXP → USE
VL	Vernacular Language	H1(d0) & H1(d1)	VL → BI
EA	E-government Awareness	H2(a0) & H2(a1) H2(b0) & H2(b1)	EA → BI EA → USE
EE	Effort Expectancy	H3(a0) & H3(a1)	EE → USE
PE	Performance Expectancy	H4(a0) & H4(a1)	PE → USE
SIH	Social Influence and Habits	H5(a0) & H5(a1) H5(b0) & H5(b1)	SIH → BI SIH → USE
BI	Behavioural Intention	H6(a0) & H6(a1)	BI → USE
PV	Price Value	H7(a0) & H7(a1)	PV → BI
PST	Privacy, Security and Trust	H8(a0) & H8(a1) H8(b0) & H8(b1)	PST → BI PST → USE
FC	Facilitating Conditions	H9(a0) & H9(a1) H9(b0) & H9(b1)	FC → BI FC → USE
QSI	Quality of services and information	H10(a0) & H10(a1)	QSI → USE

6.5.2.1 Assessment of the Overall Model Fit

To measure the overall model fit, several standards and indices were used in this study: goodness-of-fit index (GFI), normed-fit index (NFI) and relative-fit index (RFI) – all should be equal to or greater than 0.90 (Albesher, 2015); adjusted-goodness-of-fit index (AGFI) – the rule of thumb is that it should be equal to or greater than 0.80 (Albesher, 2015); index of fit (IFI) and Tucker-Lewis index (TLI) which should have a value of 0.95 and above (Ugulu, 2013); comparative fit index (CFI), (CFI-value >= 0.90) (Ugulu, 2013); and root-mean-square-error of approximation (RMSEA), (RMSEA < 0.08, shows a good fit) and (RMSEA < 0.05, shows excellent fit) (Steiger & Lind, 1980; Henseler et al., 2015). Steiger and Lind (1980) recommend that RMSEA should be used to measure some discrepancies per degree of freedom in confirmatory factor analysis, whilst CFI is regarded as a reliable and steady measure for describing the model fit. Moreover, Albesher (2015:170) recommends the use of three additional measures (CFI, TLI and GFI) to "compare the absolute fit of a specified model to the absolute fit of the independent model."

Furthermore, Hooper, Coughlan and Mullen (2008) suggest that at least three fit tests should be used to evaluate the overall fit of the model. To increase the reliability and accurateness of the measurement model fit, this study has used and reported more indices-results. The assessment of the overall model fit was done along two streams: e-government users and non-users of e-government as below:

For e-government users, the overall value of the Chi-Square (χ^2) for this study was 572.622 with 360 degrees of freedom and with (*p*-values < 0.05). Since the use of Chi-Square (χ^2) value and p-value for assessing the absolute model fit are too sensitive to sample sizes, Hooper et al., (2008) recommend the use of Chi-Square (χ^2) over degrees-of-freedom, since it is considered to be more robust and a satisfactory measurement. The recommended value of Chi-Square over degrees-of-freedom should range between 1 and 3 (Kenny, 2015) and the values obtained for this study meet this rule of thumb, with CMID/DF equal to 1.591.

The rest of the model fit indices of the e-government user measurement model revealed excellent average scores: GFI-value = 0.930, NFI-value = 0.959; RFI-value = 0.900; AGFI-value = 0.910, TLI-value = 0.950, IFI-value = 0.959 and RMSEA-value = 0.035. However, the comparative fit index (CFI) value (0.898) obtained for this study was very close to the minimum acceptable value of 0.90 and the researcher decided to adopt it as acceptable. Table 6-35 shows that two iterations (revisions for the structural model, i.e. (1) and (2)) were done and Structural Model 2 was adopted as the acceptable final model for e-government users with all indices above the minimum recommended values – thus demonstrating a good fit of the proposed model.

Table 6- 35: Comparison of the CFA Model to the Structural Model (Revised Model): e-Gov users

Assessment Fit Index	Retention Model (CFA)	Revised Model Structural Model: 1	Revised Final Structural Model: 2
χ^2	572.622	469.693	416.283
Degree of Freedom	360	308	282
Probability Level	0.003	0.000	0.000
CMIN/DF	1.591	1.525	1.476
GFI	0.930	0.938	0.942
AGFI	0.910	0.918	0.923
NFI	0.959	0.967	0.973
RFI	0.900	0.912	0.920
TLI	0.950	0.959	0.965
IFI	0.959	0.967	0.972
CFI	.0898	0.911	0.920
RMSEA	0.035	0.033	0.031

Table 6-36 provides a summary of the measurement model fit indices for non-users of e-government system. The overall value of the Chi-Square (χ^2) was 49.873 with 25 degrees of freedom and with (p-values < 0.05). The value of CMID/DF was 1.995 and within the recommended range. The rest of the measurement model fit indices for non-users of e-government system were as follows: GFI-value = 0.961, NFI-value = 0.929; AGFI-value = 0.914, TLI-value = 0.932, IFI-value = 0.963, CFI-value = 0.962 and RMSEA-value = 0.064, thus supporting the findings.

For the non-users of e-Government (Table 6-36) several iterations were done to come up with the revised final structural model (1) with all indices above the minimum recommended values – thus demonstrating a good fit of the proposed model.

Table 6- 36: CFA Model versus Structural Model (Revised Model) for non-users of e-Gov

Assessment Fit Index	Retention Model (CFA)	Revised Final Structural Model: (1)
χ^2	49.873	38.113
Degree of Freedom	25	24
Probability Level	0.002	0.000
CMIN/DF	1.995	1.588
GFI	0.961	0.969
AGFI	0.914	0.930
NFI	0.929	0.946
RFI	0.89	0.910
TLI	0.932	0.960
IFI	0.963	0.979
CFI	0.962	0.978
RMSEA	0.064	0.049

Ugulu (2013) recommend that after confirming the validity of the structural model in SEM, researchers should evaluate individual path coefficients of the variable constructs for significance. Following Ugulu's (2013) suggestion, the next section assesses the individual path coefficients of the latent variables for both users and non-users of e-government. The examination of individual path coefficients for e-government users (Figure 6-4) revealed that the education level and experience of use regression weights exerted a significant effect on use behaviour of e-government. Similarly, e-government awareness; privacy, security and trust; social influence and habits; and behavioural intention were found to have a significant influence on USE (use behaviour of e-government). However, facilitating conditions and performance conditions were found to have no significant effect on USE. Moreover, latent variables with lesser item-to-total correlation (EE2, EE4, PST7, PST8 and EA4) were dropped from the analysis in Figure 6-4.

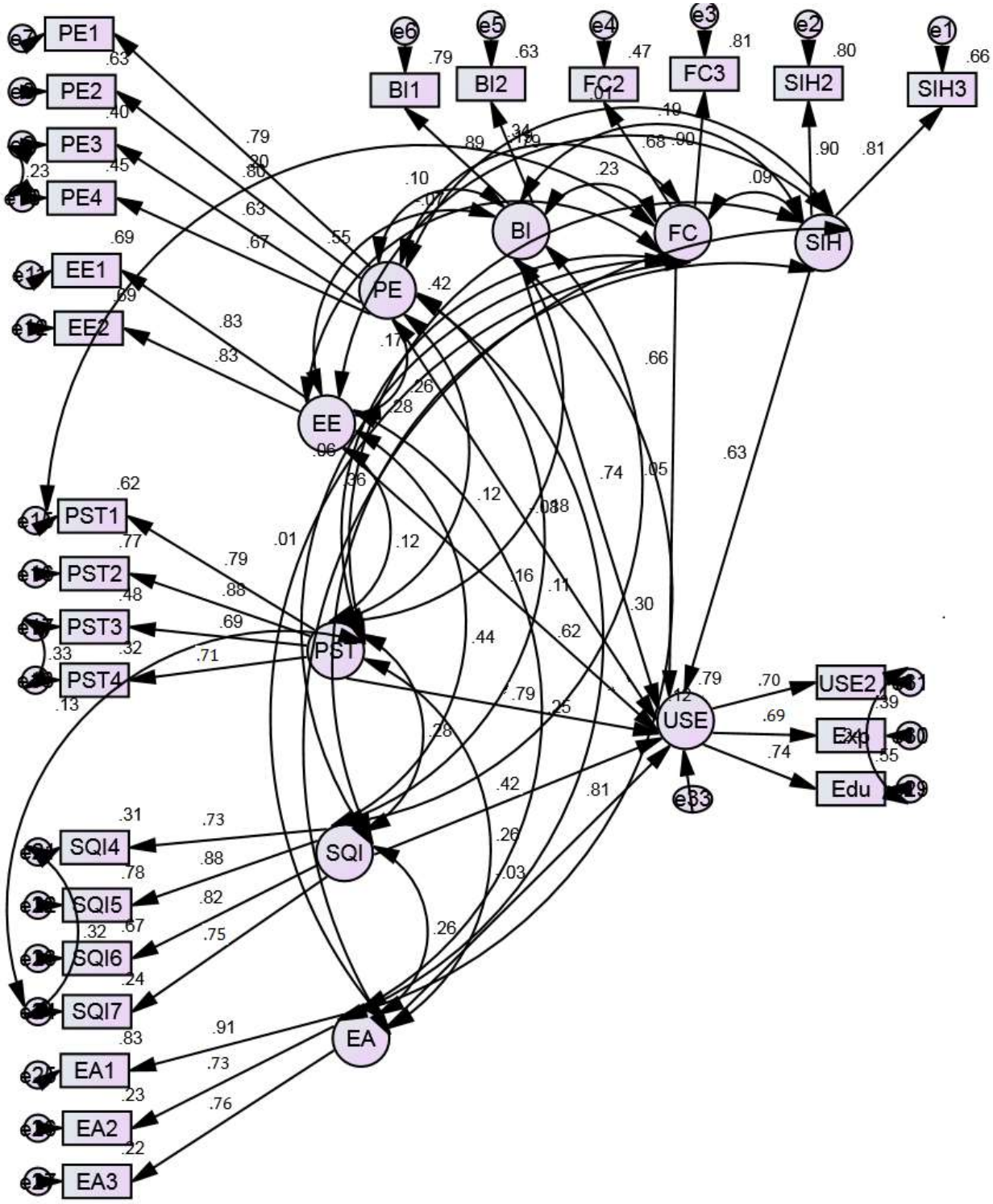


Figure 6- 4: Final model for e-Government users with standardised path coefficients

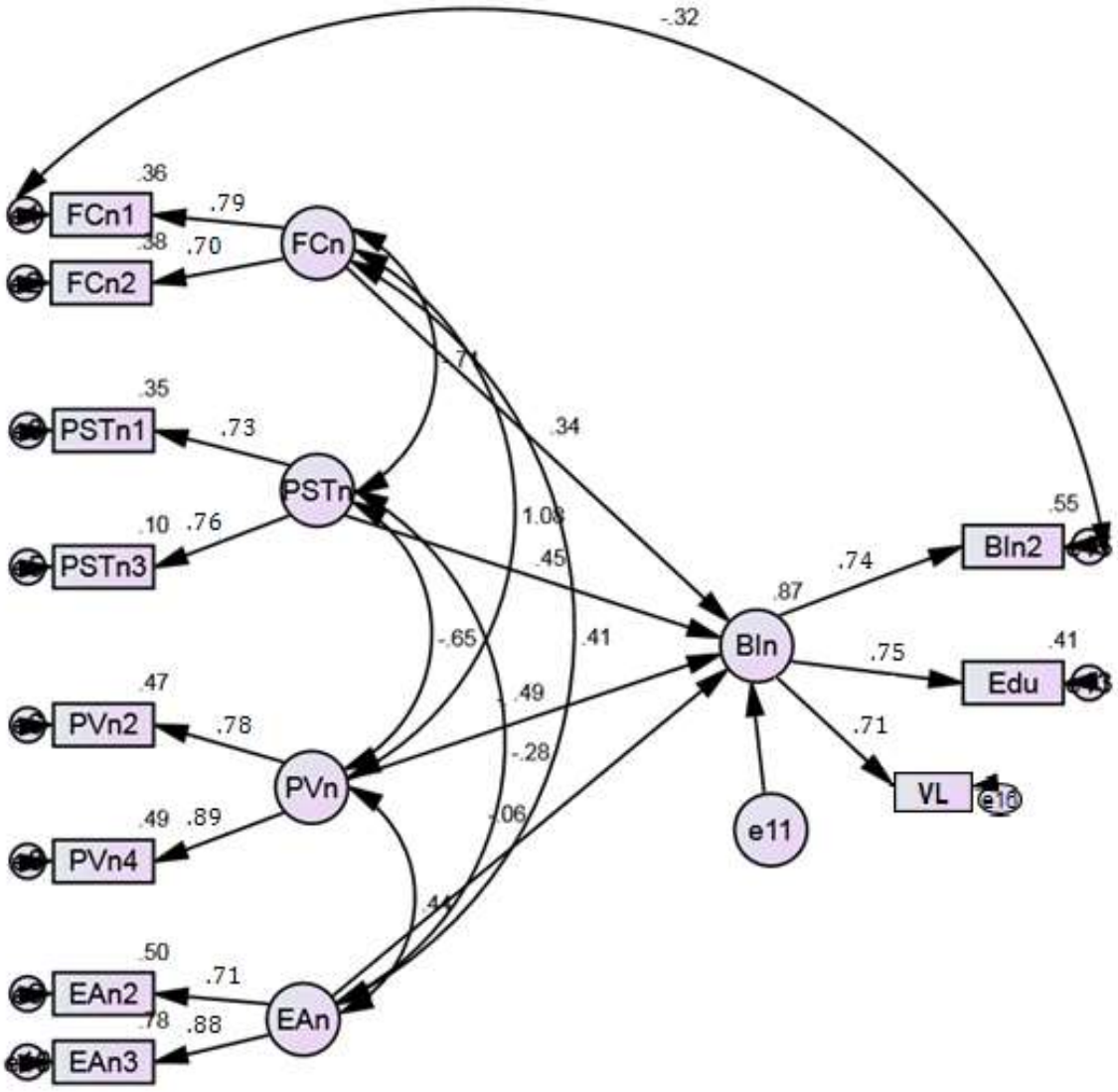


Figure 6- 5: Final model for non-users of e-Gov with standardised path coefficients

Figure 6-5 shows a summary of the valid latent variables with standardised loadings generally above the minimum recommended value of 0.5 (Yong & Pearce, 2013). To overcome Heywood case (Byrne, 2016) (situation were latent variables have less than three observed variables), each of the latent variables in Figure 6-5 were drawn with a minimum of three observed variables. However, those indicator variables with low loadings and adding no value to the final model (i.e. PSTn1, PVn3 and EAn1) were eliminated from the final analysis as they were not adding any value to the model. Furthermore, facilitating conditions, price value, e-government awareness, education level; and privacy, security and trust were found as good predictors of citizens' behavioural intention to adopt e-government systems in SADC.

6.5.2.2 Testing the Hypotheses

After validating the structural models for e-government users (use behaviour) and non-users (behavioural intention), seventeen hypotheses paths were tested. To validate and test the structural models, covariance matrixes between the hypothesised associations (See Table 6-34 and Table 6-37) were used. To test the hypotheses, this study adopts Hair's et al., (2014) recommendation: the parameter coefficient value is statistically significant (at $p < 0.05$ level) when it's critical ratio (C.R.)/t-value for a standardised regression weight is greater than 1.96. In the IBM AMOS 24, the CR is automatically calculated; but in practice, it is obtained by dividing the standardised regression weight by its standard error (S.E). Fourteen out of the seventeen hypothesised paths were statistically significant in this study (see Table 6-37 and Table 6-39). For the e-government users structural model, two hypothesised paths; first one between performance expectancy and use behaviour (H4) with CR value of -1.53 (less than 1.96), β = -0.11and (*p*-value (0.126) > 0.05); and the second one between facilitating conditions and use behaviour (H9 (b)) with CR value of 0.91 (< 1.96), β = 0.66 and (*p*-value (0.361) > 0.05); were all not statistically significant. Therefore, hypotheses H4 and (H9 (b)) were both rejected.

Eight hypothesised paths associated with the e-government use structural model between education level and use behaviour; experience in use and use behaviour; e-government awareness and use behaviour; effort expectancy and use behaviour; social influence and habits, and use behaviour; privacy, security and trust, and use behaviour; service quality and information, and use behaviour; behavioural intention and use behaviour; were all statistically significant at *p*-value < 0.05 with critical ratios above 1.96 (see Table 6-37). The results in Table 6-37 shows that use behaviour was positively influenced by one's level of education, thus the null hypothesis H1(b0) was rejected. Hence, the alternative hypothesis (H1 (b1)) was supported ($\beta = 0.74$; *p*-value < 0.05). Experience of using the internet had a positive influence on one's use behaviour of e-government systems. Therefore, the alternative hypothesis (H1 (c1)) was supported ($\beta = 0.74$; *p*-value < 0.05), while the null hypothesis, (H1 (c0)) was rejected.

The results established that e-government awareness positively influenced the use behaviour of an e-government system. In this context, the null hypothesis (H2 (b0)) was rejected. As a result, the alternative hypothesis (H2 (b1)) was accepted ($\beta = 0.81$; *p*-value < 0.05).

The path coefficient between effort expectancy and use behaviour is $\beta = 0.62$ with p-value < 0.05. Therefore, the alternative hypothesis (H3 (a1)) was supported. Similarly, citizens' use behaviour on e-government system is positively influenced by social influence and habits. For that reason, the alternative hypothesis (H3 (b1)) was accepted with $\beta = 0.63$ and a p-value < 0.05. Use behaviour is positively influenced by behavioural intention. Consequently, the alternative hypothesis (H6 (a1)) cannot be rejected ($\beta = 0.74$ with a significant p-value < 0.05). The results in Table 6-37 shows that privacy, security and trust has a significant positive influence on use behaviour in e-government systems with a path coefficient of ($\beta = 0.79$ and a significant p-value < 0.05). Thus, the alternative hypothesis (H8 (b1)) is accepted at the expense of the null hypothesis (H8 (b0)). A significant positive relationship between service quality and information and use behaviour was discerned, with a path coefficient of ($\beta = 0.42$ and a p-value < 0.05). Therefore, the alternative hypothesis (H10 (a1)) is supported.

Table 6- 37: Path Coefficient for the Structural Model (Revised Model): e-Gov users

Hypothesised Path			Estimate	S.E.	C.R.	β	*P*-Value
Use Behaviour	<---	Education Level	.75	.07	10.71	.74	***
Use Behaviour	<---	Experience in use	.61	.06	10.17	.69	.010**
Use Behaviour	<---	E-Government Awareness	.84	.11	7.64	.81	***
Use Behaviour	<---	Effort Expectancy	.52	.04	12.48	.62	.010**
Use Behaviour	<---	Performance Expectancy	-.08	.05	-1.53	-.11	.126
Use Behaviour	<---	Social Influence and Habits	.65	.06	10.83	.63	.043*
Use Behaviour	<---	Privacy, Security and Trust	.21	.02	10.50	.79	***
Use Behaviour	<---	Facilitating Conditions	.48	.52	.91	.66	.361
Use Behaviour	<---	Service Quality and Information	.26	.07	3.71	.42	***
Use Behaviour	<---	Behavioural Intention	.74	.09	8.24	.74	***

Note: Estimate = standard regression weights/path estimates; S.E. = standard error; C.R. = critical ratio/t-value; p-value = significance level.
*$p < .05$; ** $p < .01$; *** $p < .001$

Table 6-38 presents the squared multiple correlations R^2 for the eight endogenous constructs associated with e-Gov Users (use behaviour). The squared multiple correlations are statistical measures (ranging between 0 and 1) for establishing how well regression-lines estimates actual data points (Hair et al., 2014). Moreover, Hair et al., (2014) posit that R^2 is a measure of how well a model is in predicting another or a trend; and the closer the R^2-value is to one, the better the predictive power. Table 6-38 shows that 79 percent of the discrepancy among the seven endogenous factors (effort expectancy; e-government awareness; education level; experience in use; social influence and habits; service quality and information; privacy, security and trust) were explained by the use behaviour of e-government systems.

Table 6- 38: Proportion of Variance Accounted for by Predictors of Endogenous Constructs: e-Gov users

Endogenous Construct	R^2
Use Behaviour (USE)	.79
Privacy, Security and Trust (PST)	.57
Effort Expectancy (EE)	.69
Service Quality and Information (SQI)	.78
Social Influence and Habits (SIH)	.80
E-Government Awareness (EA)	.53
Experience in use (Exp)	.39
Education Level (EDU)	.56

Table 6-39 shows that six of the seven hypothesised paths associated with the non-users of e-government system structural model between education level and behavioural intention; vernacular language and behavioural intention; e-government awareness and behavioural intention; price value and behavioural intention; facilitating conditions and behavioural intention; privacy, security and trust, and behavioural intention; were all statistically significant at p-value < 0.05 with critical ratios above 1.96 (see Table 6-39).

Table 6-39 shows that the level of education possessed by an individual has a positive significant influence on one's behavioural intention to use e-government systems. Therefore, the alternative hypothesis (H1 (a1)) was supported (β = 0.64; p-value < 0.05). Similarly, the availability of vernacular language options on e-government systems had a positive influence on one's behavioural intention to use such systems. Hence, the alternative hypothesis (H1 (d1)) was supported (β = 0.64; p-value < 0.05) at the expense of the null hypothesis (H1 (d0)).

Considering e-government adoption, however, the findings revealed that e-government awareness had a positive significant influence on one's behavioural intention to adopt such systems. As a result, the alternative hypothesis (H2 (a1)) was supported (β = 0.44; p-value < 0.05).

The path coefficient between price value and behavioural intention to use e-government systems is (β = -0.49 with p-value < 0.05). Therefore, the alternative hypothesis (H7 (a1)) is accepted. The negative significant path coefficient implies that as the price (PV) for accessing the internet increases, citizens' behavioural intention to use e-government systems decreases. Also, privacy, security and trust, had a positive influence on citizens' behavioural intention to use e-government systems. For that reason, the alternative hypothesis (H8 (a1)) could not be rejected (β = 0.45; p-value < 0.05). Facilitating conditions had a positive significant influence on behavioural intention to use e-government systems. Hence, the alternative hypothesis (H9 (a1)) was accepted (β = 0.71; p-value < 0.05). However, one hypothesised path (H5 (a)) between behavioural intention and, social influence and habits with a CR value of 1.52 (< 1.96) and a beta value of 0.27 was not statistically significant (p-value (0.235) > 0.05). Hence, hypothesis (H5 (a)) was rejected.

Table 6- 39: Path Coefficient for the Structural Model (Revised Model): non- users of e-Gov

Hypothesised Path			Estimate	S.E.	C.R.	β	*P*-Value
Behavioural Intention	<---	Education Level	.64	.07	8.86	.64	***
Behavioural Intention	<---	Vernacular Language	.45	.06	7.50	.71	***
Behavioural Intention	<---	E-Government Awareness	.71	.13	5.46	.44	***
Behavioural Intention	<---	Social Influence and Habits	.32	.21	1.52	.27	.235
Behavioural Intention	<---	Price Value	-.68	.07	-9.71	-.49	***
Behavioural Intention	<---	Privacy, Security and Trust	.59	.17	3.47	.45	***
Behavioural Intention	<---	Facilitating Conditions	.60	.08	7.70	.71	***

Note: Estimate = Standard Regression Weights/Path Estimates; S.E. = Standard Error; C.R. = Critical Ratio/t-value; p-Value = Significance Level.

Hypothesised Path	Estimate	S.E.	C.R.	β	*P*-Value
*$p < .05$; ** $p < .01$; *** $p < .001$					

Table 6-40 shows that 87 percent of the discrepancies among the six endogenous constructs (price value; e-government awareness; education level; vernacular language; facilitating conditions; privacy, security and trust) were explained by the behavioural intention to adopt e-government systems.

Table 6- 40: Proportion of Variance Accounted for by Predictors of Endogenous Constructs: non-users of e-Gov

Endogenous Construct	R^2
Behavioural Intention (BIn)	.87
Education Level (Edu)	.41
E-Government Awareness (EAn)	.78
Price Value (PVn)	.47
Privacy, Security and Trust (PSTn)	.35
Vernacular Language (VLn)	.52
Facilitating Conditions (FCn)	.36

Note for Figure 6-6:

Only standardized path coefficients that were significant are displayed.

β = standardized coefficients; **C.R.** = critical ratio/*t*-value; R^2 = squared multiple correlations

*$p < .05$; ** $p < .01$; *** $p < .001$

Effort Expectancy (EE), e-Government Awareness (EA), Social Influence and Habits (SIH), Service Quality and Information (SQI), and Privacy, Security and Trust (PST), Level of Education (EDU), Experience in use (EXP) and Behavioural Intention (BI) were found to have positive influence on use behaviour of e-government systems (USE) (see Figure 6-6). The standardised coefficients (Beta-values) of the e-Government Use weights range from 0.42 (SQI) to 0.81 (EA), and with *t*-values (C.R) ranging from 3.71 (SQI) to 12.48 (EA) (see Figure 6-6). Moreover, Facilitating Conditions (FCn), e-Government Awareness (EAn), and Privacy, Security and Trust (PSTn), Social Influence and Habits (SIH), Level of Education (EDU) and Vernacular language option (VL) positively influenced citizens' behavioural intention (BI) to adopt e-government systems. The standardised beta coefficient weights (β) for BI ranged between 0.44 (EAn) and 0.71 (FCn), and with *t*-values (C.R) ranging from 3.47 (PSTn) to -9.71 (PVn) (see Figure 6-6). However, Price Value (PVn) had a negative effect on behavioural intention.

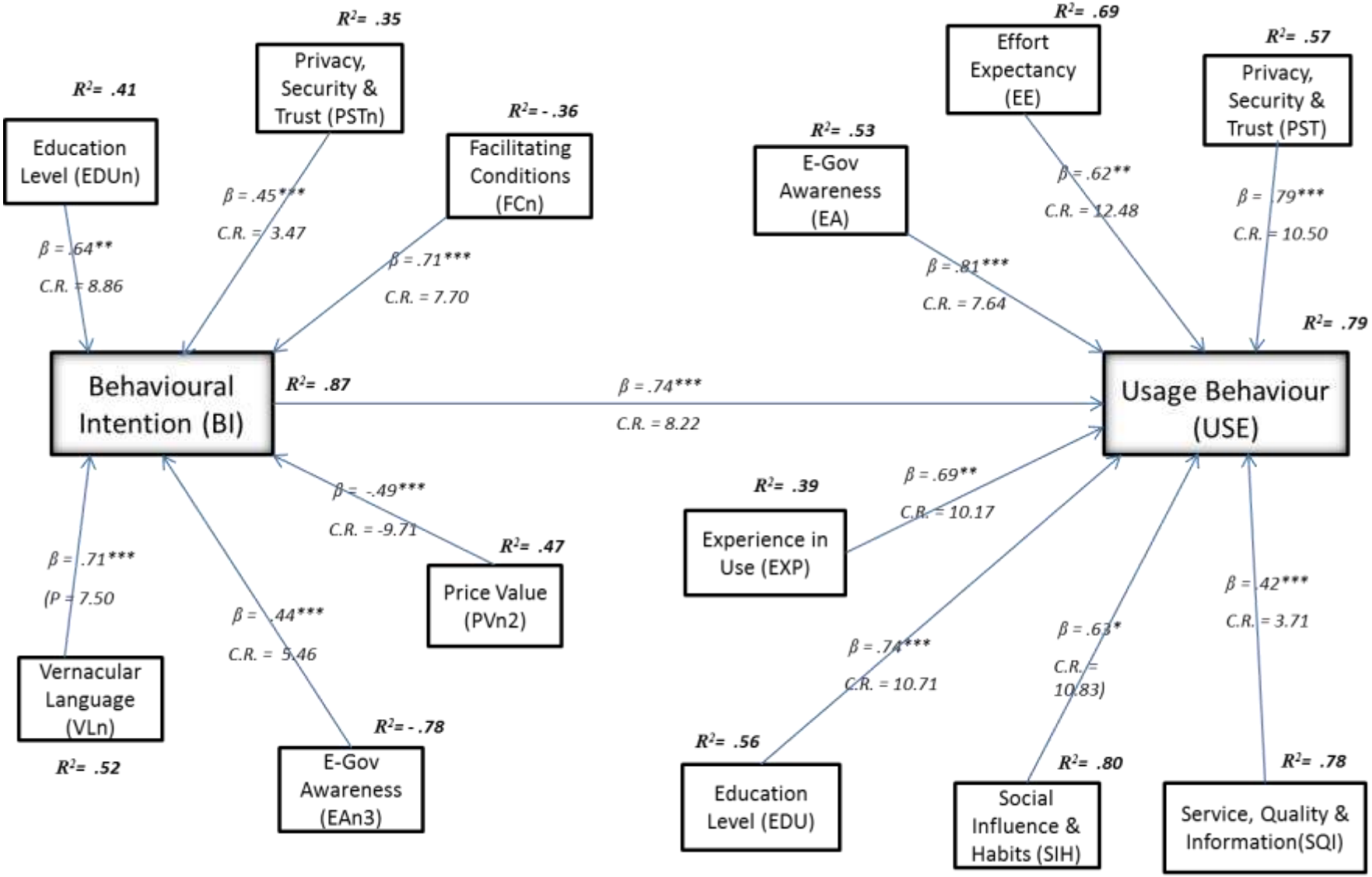


Figure 6- 6: Refined e-Government Adoption and Utilisation Conceptual Model with Standardised Coefficient Paths

6.6 Summary of Hypotheses Testing

Table 6-41 summarises the seventeen research hypotheses established in Chapter three for this study. All the hypotheses were tested to establish the extent to which the independent variables meaningfully described the two dependent variables (intention to use and use behaviour) used in this analysis. As confirmed in Table 6-41, fourteen of the seventeen hypothesised paths were significant (p-value < 0.05) and hence supported.

Table 6- 41: Summary of Hypotheses Testing for the Structural-Model

Hypothesis No.		Research Hypothesis Statement	Results	β	Sig.
H1	(a1)	Level of education influences behavioural intention to adopt e-government systems.	Accepted	.64	***
	(b1)	Level of education influences use behaviour in an e-government system.	Accepted	.74	***
	(c1)	Experience of using the internet influences use behaviour of e-government systems.	Accepted	.69	.010**
	(d1)	Availability of vernacular language option influences behavioural intention to adoption e-government systems.	Accepted	.71	***
H2	(a1)	Awareness of e-government influences behavioural intention to adopt e-government systems.	Accepted	.44	***
	(b1)	Awareness of e-government influences uses behaviour of e-government systems.	Accepted	.81	***
H3(a1)		Effort Expectancy influences use behaviour of e-government systems.	Accepted	.62	.010**
H4		Performance Expectancy positively influences citizen's use behaviour of e-government systems.	Rejected	-.11	.126
H5	(a)	Social influence and habits positively influence citizen's behavioural intention to adopt e-government systems.	Rejected	.27	.235
	(b1)	Social influence and habits influences use behaviour of e-government systems.	Accepted	.63	.043*
H6(a1)		Citizens' behavioural intention to adopt e-government systems influences use behaviour of such systems.	Accepted	.74	***
H7(a1)		Price value associated with internet access influences citizens' behavioural intention to adopt e-government systems.	Accepted	-.49	***

(continues)

H8	**(a1)**	Citizens' perceived privacy, security and trust influence their behavioural intention to adopt e-government systems.	Accepted	.45	***
	(b1)	Privacy, security and trust influences citizens' use behaviour of e-government systems.	Accepted	.79	***
H9	**(a1)**	Facilitating conditions influences citizens' behavioural intention to adopt e-government systems.	Accepted	.71	***
	(b)	Facilitating conditions positively influences citizens' use behaviour of e-government systems.	Rejected	.66	.361
H10(a1)		Quality of services and information influences citizens' use behaviour of e-government systems.	Accepted	.42	***

6.7 Chapter Summary

This chapter sought to answer research questions two, four and objective number two, regarding ascertaining the usefulness (in-line with adoption and utilisation) of e-government services in the SADC region from the citizens' perspective. In-line with research question four, this chapter sought to identify and confirm factors affecting the adoption and utilisation of e-government. To answer the research questions, several mathematical models were employed to ascertain the seventeen hypotheses proposed in Chapter 3.

The first step involved defining the two dependent variables of e-government adoption and utilisation, which are behavioural intention to use and use behaviour. Then all the other constructs of the model were mathematically evaluated to establish how they best fit and explain the two dependent variables. The Pearson's Chi-Square Test (χ^2) for the independence of association was conducted to establish the extent to which the hypothetic-model fits the collected data. Various demographic variables were tested against e-government adoption and utilisation to establish the significance of any differences and for testing hypothesis. Findings illustrated that the goodness of fit of all demographic variables for both e-government users and non-users were tested and the hypotheses confirmed at the alpha level of significance of 0.05. The strength of association between e-government adoption, utilisation, and demographic variables was tested and confirmed using Phi and Cramer's V tests.

Reliability analysis to establish the internal consistency and reliability of all measurement scales associated with e-government adoption and utilisation was performed using Cronbach's Alpha. Overall, the Cronbach Alpha's results for this study confirmed that the study instruments were reliable with all values above the minimum rule of thumb of 0.50 accepted in the Information Systems field – thus indicating proper internal construct-reliability.

Construct validity of measurement instruments was conducted using Principal Factor Analysis (PFA) with varimax rotation method. In addition, assessment of validity and unidimensionality of scales was done using Exploratory Factor Analysis (EFA) together with the correlation coefficients of all instrument-scales of the adopted conceptual framework of the study (PDEGAUM). Five different measures were used to establish construct validity in line with PFA and EFA: the correlation matrix measure using the average determinant score values of variable scales of constructs were all above the rules of thumb of 0.0001. The Kaiser-Meyer-Olkin test was used to evaluate sampling adequacy – and thus further assisted in scrutinising the study findings of factor analysis. Overall, findings showed good sampling adequacy with KMO values for all construct variables for the study above the 0.50 minimum values. Those construct variables with insignificant Bartlett's Test of sphericity (p-value > 0.05) and (KMO-value < 0.50) were dropped from Factor loading. Furthermore, the findings showed that there were no cross-loading and factors with at least a score of 0.40 were loaded and extracted. In addition, factor plots in rotated factor space and scree plots were used to further validate the constructs.

In addition, multiple regression analysis using ANOVA test and structural equation modelling (SEM) using confirmatory factor analysis were used to test the study model. Both methods suggested that Facilitating Conditions, Price Value, e-Government Awareness; and Privacy, Security, and Trust (independent-variables) meaningfully explained behavioural intention (dependent variables) of citizens to adopt e-government systems. The moderating factors of Level of Education and Vernacular Language options were found to have a positive effect on citizens' behavioural intention to use e-government systems. In-line with the Use behaviour dependent variable, six independent variables (Effort Expectancy; Privacy, Security and Trust; e-Government Awareness; Service Quality and Information; Social Influence and Habits; and Behavioural Intention) had a positive influence on the actual utilisation of e-government systems by citizens.

Again, the results showed that two moderators (education level and experience in using computer/smartphone and the internet) significantly moderated Use Behaviour in e-government systems.

Finally, the analysis of results in this chapter was concluded by revisiting and refining the PDEGAUM framework proposed in Chapter 3 by incorporating only significant path coefficients as presented in Figure 6-6 and summing up the tested hypotheses in Table 6-41.
The next Chapter (7) provides the qualitative data analysis for the qualitative strand of the sequential mixed methods approach adopted in this study. Therefore, Chapter 7 is used to confirm the findings of the quantitative data analysis (done in Chapter 6).

Chapter 7: Qualitative Analysis

Chapter Overview

This chapter presents further and deeper analysis, supplementing those presented in Chapters 5 and 6. Chapter five provided detailed procedures for data cleaning, validity, reliability and descriptive statistics to establish the levels of e-government adoption and utilisation by citizens in Zambia and Zimbabwe. Chapter six presented advanced statistical analysis, testing the reliability and validity of constructs; using regression analysis and structural equation modelling to establish their significance in the proposed People-Driven e-Government Adoption and Utilisation (PDEGAUM) conceptual model. In this chapter, the empirical qualitative data collected from respondents who previously participated in the quantitative data survey was analysed using Nvivo Plus version 11 Qualitative Software Package and thematic data analysis to deeply explore the effect of variables on citizens' intention to adopt and utilise e-government systems. As indicated in the Literature Review (Chapters 2 and 3), there are few studies on e-government adoption and utilisation in the context of the SADC. Furthermore, and as acknowledged in many studies on e-government, there is a need for empirical studies that evaluate both adoption (citizens' intention to use) and utilisation (actual and continuous usage) of e-government systems and thus contributing new insights and context to the body of knowledge in this field. It should be clarified at this juncture and as already explained in Chapter 4 that the adoption of explanatory sequential mixed methods design (encompassing both quantitative and qualitative methodologies and their methods) were not specifically for comparative analytical (data triangulation) purposes, but strengthening the study through utilisation of multiple methods that compliment on one another.

This chapter starts by outlining the profile of the respondents of the study, followed by the theoretical grounding underpinning the qualitative data analysis.

7.1 Profile of the Respondents

Semi-structured interviews were used to collect data from the eight respondents, who were purposively selected, one participant from each of the eight identified economic regions of the case study (as shown in Table 4-6 and Table 4-7 in Chapter 4). Since the purpose of this qualitative inquiry was to "follow up the quantitative results and explore the results in more depth," (Creswell, 2014:274), the interviewees were composed of the same respondents who previously participated in the quantitative study. The interviewees for the study were purposively selected by the researcher using the contact details provided on consent forms by respondents during quantitative data collection. In the first round of communication, sixteen participants were identified and communicated regarding their willingness to participate in the interviews. Only seven participants volunteered to take part in the interview process in the first round of communication. The researcher had to reach out to the other five participants to ensure that if others failed to participate, there will be extra four participants to pick from for the interviews. Table 7-1 summarises the characteristics and demographic information of the interviewees.

Table 7- 1: Demographic information of the interviewees

Demographic Aspect	Demographic Details of Participants
Gender	• 4 male • 4 females
Age	• Ranged between 18 to 75
Highest Educational Qualifications	• 1 PhD • 1 master degree • 2 Bachelor's • 2 Diploma • 2 High School leaving certificate or less
Experience in Using e-Government	• 0 months to 13 years

7.2 Theoretical Basis for the Qualitative Data Analysis

The researcher adopted the Total Quality Framework (TQF) (Roller & Lavrakas, 2015) as a theoretical basis for executing the qualitative data analysis for this study. The Total Quality Framework offered a comprehensive tool that used for generating, organising and interpreting this qualitative analysis. The TQF was found most suitable for this study because it allowed the researcher to determine the efficacy of the qualitative research design, integrate "design features that maximise the credibility of the data they gather, the accuracy of the analyses they conduct, and the usefulness of the outcomes from" the audience's perspectives (Roller & Lavrakas, 2015: vi). Figure 7-1 illustrates the four phases of the TQF that guided this study.

7.2.1 Credibility

Credibility focused on data collection procedures; specifically, issues related to the completeness and accuracy of the qualitative data collected. Two critical aspects were sought under credibility: scope and data gathering as illustrated in Figure 7-1.

7.2.1.1 Scope

Firstly, under the scope, the researcher focused on outlining and achieving the following aspects: representation, coverage, sampling technique adopted, and sample size and unit nonresponse. In line with coverage, participants for the interviews were drawn from each of the eight identified residential areas in Harare and Lusaka provinces. Since the purpose of the qualitative data gathering was to gain further insights and in-depth understanding of the quantitative findings from both non-users and users of e-government systems using purposive sampling technique; representation was not much sought. The researcher used the contact details provided by participants during the quantitative data collection process to purposively sample the eight interviewees for this study – four from each country and comprised of two interviewees who have used e-government systems and two non-users. In addition to determining the most appropriate sample size, Onwuegbuzie and Collins (2007) suggest that the number of interviewees for a case study research design should range from 3 to 12 participants and the 8 participants selected for this study are in line with this recommendation.

Moreover, Onwuegbuzie and Collins (2007:289) noted that sample sizes for qualitative strand of the mixed methods approach "should not be so small as to make it difficult to achieve data saturation, theoretical saturation, or informational redundancy," or too big so "that it is difficult to undertake a deep, case-oriented analysis."

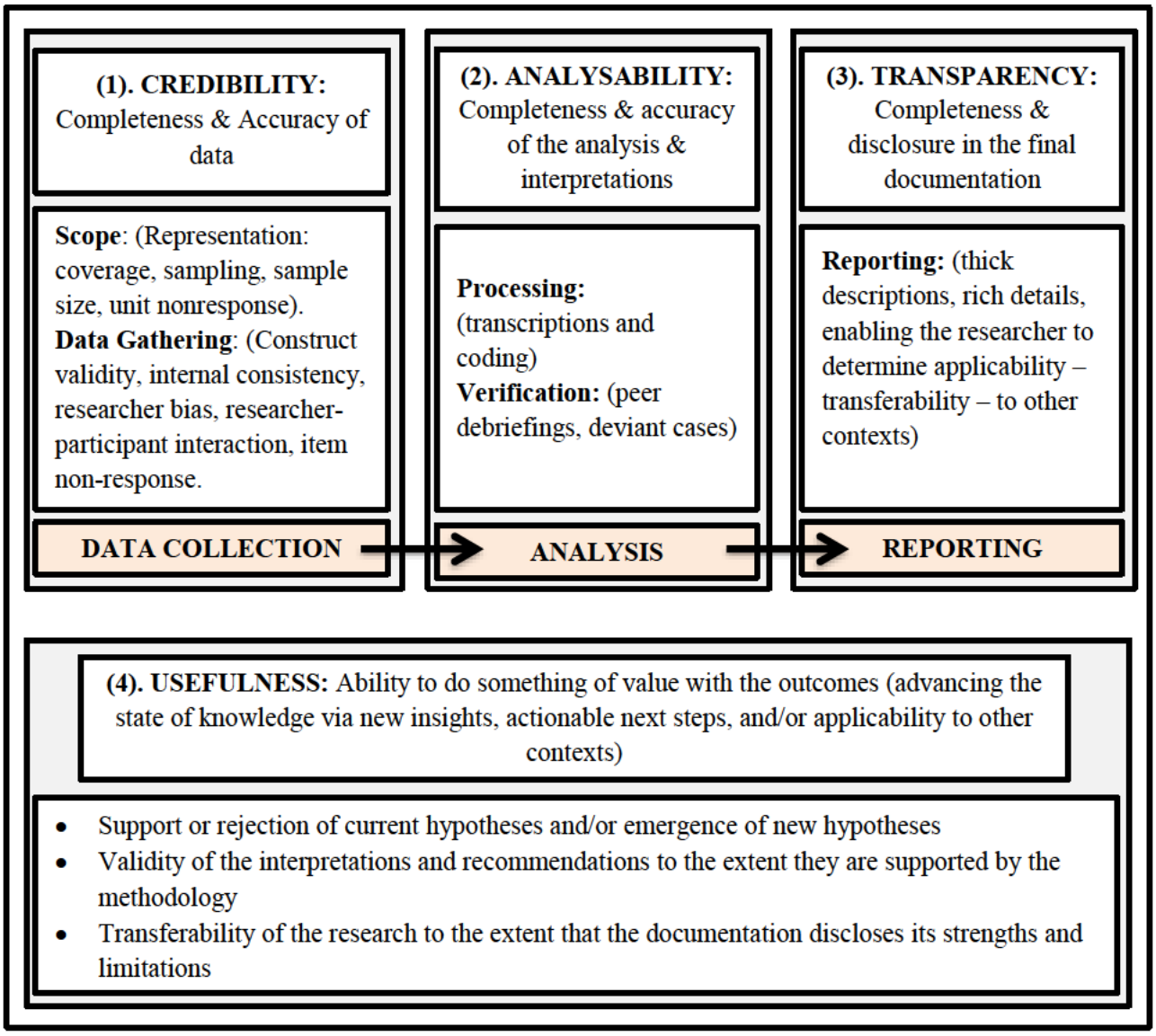


Figure 7- 1: Total Quality Framework for Executing Qualitative Data Analysis (Roller & Lavrakas, 2015)

Unit nonresponse errors is an inherent feature of all survey and case-study based research that occurs when an eligible sample member could not be contacted, refuse to participate for some reasons or decides to participate; but provides inadequate information that could not be used to reach a decision (Cobben, 2009). Two major unit nonresponse errors encountered in this study related to non-contact and refusal. In-line with non-contact error, the researcher initially faced

some challenges with reaching out to two of the selected sample members, one from each country. Precautionary measures were already in place, in anticipation of such problems – two lists of interviewees were compiled (one with eight participants as the primary target and the other group with four as a back-up) and the respondents were notified about the purpose of the interview, data and time. The researcher also faced refusal nonresponse errors in which some of the eligible sample members refused to either answer or provide adequate responses that could permit meaningful data analysis. The researcher addressed this error by handing out cover letters and consent forms (with contact details of both the researcher and the promoter) approved and endorsed by the UKZN Ethics Committee to all sample members. These documents assisted in demonstrating the seriousness of the survey. Furthermore, the researcher had to use succinct semi-structured questions to permit sticking to the maximum 30 minutes allocated and promised for each interview session.

7.2.1.2 Procedures adopted for Data Gathering

Prior to conducting the interviews, the researcher made appointments with all interviewees who were purposively selected and arrangement for the venues with minimal disruptions done. Face-to-face interviews were conducted for both e-government users and non-users of e-government systems by the researcher. The researcher used the face-to-face interviews in order to gain broader picture, understanding, emotions, and reactions of respondents' lived experience and viewpoints regarding e-government adoption and utilisation. Based on Almalki's (2016) suggestion that adequate insights, knowledge, and sentiments of participants can only be gained by using face-to-face interviews as compared to any other forms of interviews like telephonic or electronic; the researcher has employed face-to-face interviews in this study.

The researcher commenced interviews by introducing himself to all interviewees. This was followed by a succinct overview of the purpose of the study and clarification of major terms and concepts underpinning the study. Furthermore, the researcher emphasised major ethical issues encoded in the consent forms that were given to all respondents, that their participation in this study was invaluable to the successful completion of the study and that all collected information was treated confidentially and with a high degree of anonymity. Additionally, the researcher informed interviewees to feel free and let the interview be a two-way open

discussion forum in which either party could gain in-depth insights. Also emphasised was the fact that there were no financial payments given for participation since this was a purely and non-funded academic research.

Probyn, Howarth, and Maz (2016) encourage researchers to capture interview data in an orderly manner for future reference and analysis using different data capturing mechanisms. In this study, the researcher used notes writing and audio recordings to collect data from interviewees after being granted the permission to capture the conversation. Therefore, the data corpus for this study comprised of interview audio tapes and interview scripts. Creswell (2014) suggests that once the saturation point of data collection has been reached, the researcher should simply stop and proceed with qualitative data analysis. This brings us to the major question raised by Albesher (2015:188): "what is the saturation point" of qualitative data gathering? Creswell (2014:239) suggest that the saturation point is reached "when gathering fresh data, no longer sparks new insights or reveals new properties."

In this study, the data gathering process was terminated when the researcher felt that all themes were saturated. Once all interviews were concluded, audio recorded data were transcribed and verified with jotted notes; the researcher sent back to respective interviewees the transcribed version of data for verification and validity purposes before final adoption. The researcher adopted this validity check approach to eliminate possible discrepancies in the responses (Markle, West & Rich, 2011).

7.3 Tools and Methods employed for Qualitative Data Analysis

According to Roller and Lavrakas (2015:19), data analysis constitutes the biggest obstacle to researchers who utilise the qualitative research methods because "qualitative data are typically complex, multifaceted, and not easily herded into neat meaningful silos." To overcome these challenges, qualitative data analysis software (QDAS) tools have created endless opportunities for researchers in the twenty-first century to carry out qualitative content analysis (Kaefer, Roper & Sinha, 2015). Moreover, Schreier (2012) argues that QDAS' searching and modelling capabilities offer new insights, opportunities, and visibility to qualitative data in numerous

ways that were "not possible with manual methods" (Kaefer et al., 2015:5) - thus permitting the researcher to reflect deeper on the findings.

7.3.1 Selecting and Learning to use the QDAS

In this study the researcher used Nvivo Plus version 11 QDAS package for qualitative data analysis as it provided a wider range of tools essential for handling thick rich qualitative data records. These rich data records were built up from interviews, jotted field notes and audio sources. Nvivo QDAS was selected for use in this study because the license fees were covered by our institution and the learning resources like training book guides and video tutorials were readily available. High license fees could be serious drawbacks for many researchers intending to adopt and use QDAS. Open source QDAS solution like QCAMAP was an alternative option to licensed software, however, the "initial effort required to learn and master the tools offered by QDAS can pose a difficult hurdle in conducting software assisted qualitative research," (Kaefer, Roper & Sinha, 2015:5). In line with Hilal and Alabri's (2013) recommendation, Nvivo software was found ideal for this study because it allowed the execution of the following qualitative data analysis tasks:

- Managing data – it allowed the organising of muddled data documents (interview transcripts, audio and observation notes into specific nodes.
- Managing ideas – Nvivo offered the tools for extracting and organising ideas based on the defined themes for querying.
- Query data – Nvivo permitted the researcher to create questions (queries) for inferring desired meaning, save the queries for ongoing interrogation, searching and referencing.
- Modelling visually – the researcher used Nvivo for creating graphs demonstrating existing associations between conceptual and collected data.
- Reporting – extrapolating and narrating the discourse was easier since data at this point were already grouped into themes.

Refer to Section 7.4.3 for detailed procedures adopted in this study for coding interview data for Nvivo analysis.

7.4 Analysability

According to Roller and Lavrakas (2015), analysability is concerned with the completeness and accuracy of processes involved in the analysis of qualitative data, interpretation, and verification of results. In line with processing, the researcher scrutinised and synthesised the responses from interviewees typed against each question for missing or incomplete responses. For all responses that appeared to be incomplete, the researcher flagged them for verification and triangulation with audio recordings. In line with the transformation process, the researcher uploaded the original audio transcripts into the Nvivo software package without transcription. This was done to preserve the original audio source and to capitalise on the transformation and transcription power of Nvivo software to avoid the introduction of any human errors by transcriptionists.

Verification was the second integral process of the TQF Analysability component after processing, that was utilised throughout the course of this qualitative research process to ensure the reliability and validity (rigour) of the entire study. Verification contributed heavily towards the overall quality and robustness (trustworthiness) of the entire qualitative research design by looking at alternative data sources or evidence that were either contradicting or substantiating the findings. The researcher employed three major verification strategies in this study; peer debriefing, deviant cases, and member checking as narrated below:

- Member Checking, also referred to as participant validation technique explored the credibility of the collected interview data by returning the data and results back to the participants for verification "for accuracy and resonance with their experience" (Birt, Scott, Cavers, Campbell & Walter, 2016:1802).

  In this study, a member check was carried out by all eight interviewees. After the interviews, the researcher summarised the respondents' feedback on each asked question and follow-up questions and emailed them to each respective interviewee for validation for accuracy and resonance. Interviewees incorporated their input, making corrections where they found some discrepancies in the researcher's data capturing. All respondents validated data was returned within two weeks and the final version of the data compiled.
- Peer Debriefing was applied in this study by the researcher through distributing the collected data together with the interview questions and procedures used to two independent professors with a speciality in the field of ICT adoption and qualitative

research. The professors provided additional perspectives and impartial views on the methodology employed by the researcher, the transcripts and uncover any possible researcher biases. The researcher set down with the two professors to discuss the highlighted issues before incorporating them into the final report.

- Deviant Cases verification technique also referred to as negative cases (Roller & Lavrakas, 2015) was employed in this study by the researcher to actively discover outlier instances in the collected interview data which contradicted the prevailing evidence from the majority of interviewees and interpretations. The researcher used deviant cases verification technique in this study for incorporating rigour into the study design by raising a case and point of comparison between prevailing sentiments (normal cases) and responses that did not fit the dominant interpretations. All cases were presented for trustworthiness (see Section 7.5).

7.4.1 Procedures for Conducting Thematic Analysis

Thematic analysis is a technique for finding, analysing, organising and recording some identifiable patterns, commonly referred to as themes within the dataset (Braun & Clarke, 2006). According to Braun and Clarke (2006), there are two primary ways in which themes can be deduced from the thematic analysis for any data scopus, inductive (also referred to as 'bottom-up' approach) and theoretical (also referred to as deductive or 'top-down' approach). In the inductive approach, derived themes are strongly linked to the collected data (data-driven) and in most cases, they have little association with the actual questions asked to participants during the interviews or focus group, just like in the grounded theory (Javadi & Zarea, 2016). Therefore, in the inductive analysis, coding of the data is done without fitting it into preexisting coding frames. In contrast, the deductive thematic analysis approach is driven by the researcher's theoretical underpinnings and is thus, analyst-driven (Javadi & Zarea, 2016). Researchers adopt a deductive thematic analysis when they want to provide a detailed analysis of some aspects of the data set. The deductive thematic analysis was found to be most appropriate for this study since the qualitative data analysis strand of the explanatory sequential mixed methods approach adopted in this study was done to confirm and provide a deeper understanding of those factors found to be significantly influencing e-government adoption and utilisation in SADC.

Another essential decision that the researcher had to make regards the level at which themes were to be identified: semantic/explicit level versus latent/interpretative level. Javadi and Zarea (2016) recommend that thematic analysis should exclusively focus on one of these two levels for any specific study. In the semantic approach, the researcher identifies themes at the explicit or surface meaning of the data without focusing beyond the responses given by the participants. Therefore, the analysis process involves the progression from the description of data that has been structured in some patterned or summarised way in which the researcher theorises the meaning and implications of such patterns. In contrast, the latent level of analysis goes beyond the semantic by "scrutinising the underlying ideas, assumptions, conceptualisations of ideologies shaping up the semantic content of the data" (Braun & Clarke, 2006:13). This research adopts latent analysis in order to gain in-depth insights and understanding of the effect of factors affecting citizens' intentions for utilising e-government systems in the SADC region. Moreover, the latent analysis offered the advantage of discovering hidden meaning in data sets and insinuations of specific patterns.

Braun and Clarke, (2006) prescribed six steps for conducting thematic analysis, which are: familiarisation by the researcher with the qualitative data, transcription of interview data; generating of initial codes; searching for themes; reviewing the identified themes; defining and naming themes, and producing the report. In line with familiarising with the qualitative data, the researcher had to transcribe the audio data into notes and then re-confirm it through recursive listening to the recordings to gain an in-depth understanding of the data. The other five steps involved the practical implementation of the data in the Nvivo software and are illustrated and explained in section 7.4.3 of this chapter.

7.4.2 Major Themes for the Study

Bengtsson (2016) suggest that before outlining major themes for any qualitative data analysis, researchers should define their unit of analysis; which basically entails specifying 'the basic unit of text' that should be used for classifying content analysis. In qualitative analysis, gathered data or messages should first be unitised before coding to ensure consistency in coding and comparability with similar studies (Vieira Jr. & Grantham, 2016). Therefore, one of the most fundamental and decisive decisions in the qualitative content analysis is concerned with defining the 'coding unit' for the study. This study uses individual themes as the unit of

analysis, which is compatible and in-line with the already adopted deductive thematic analysis approach. By using individual themes as coding units in this study, the researcher was primarily focusing on identifying 'expressions of ideas' from the data set. Figure 7-2 summarises the themes of this study that were theoretically or deductively deduced, in-line with the top-down thematic analysis approach adopted. Each of the identified sub-theme in Figure 7-2 has got numerous sub-sub-themes that could not be shown here for clarity purpose. Refer to Figure 7-5 for a full view of the Nvivo tree nodes (themes, sub-themes, and sub-sub-themes) structure. Since this qualitative study was a follow up to the quantitative study (deductive); the researcher followed up only on those constructs that had significant values (as listed under sub-themes in Figure 7-2). This was justified on the grounds of saving time by not investigating the entire constructs established for the study.

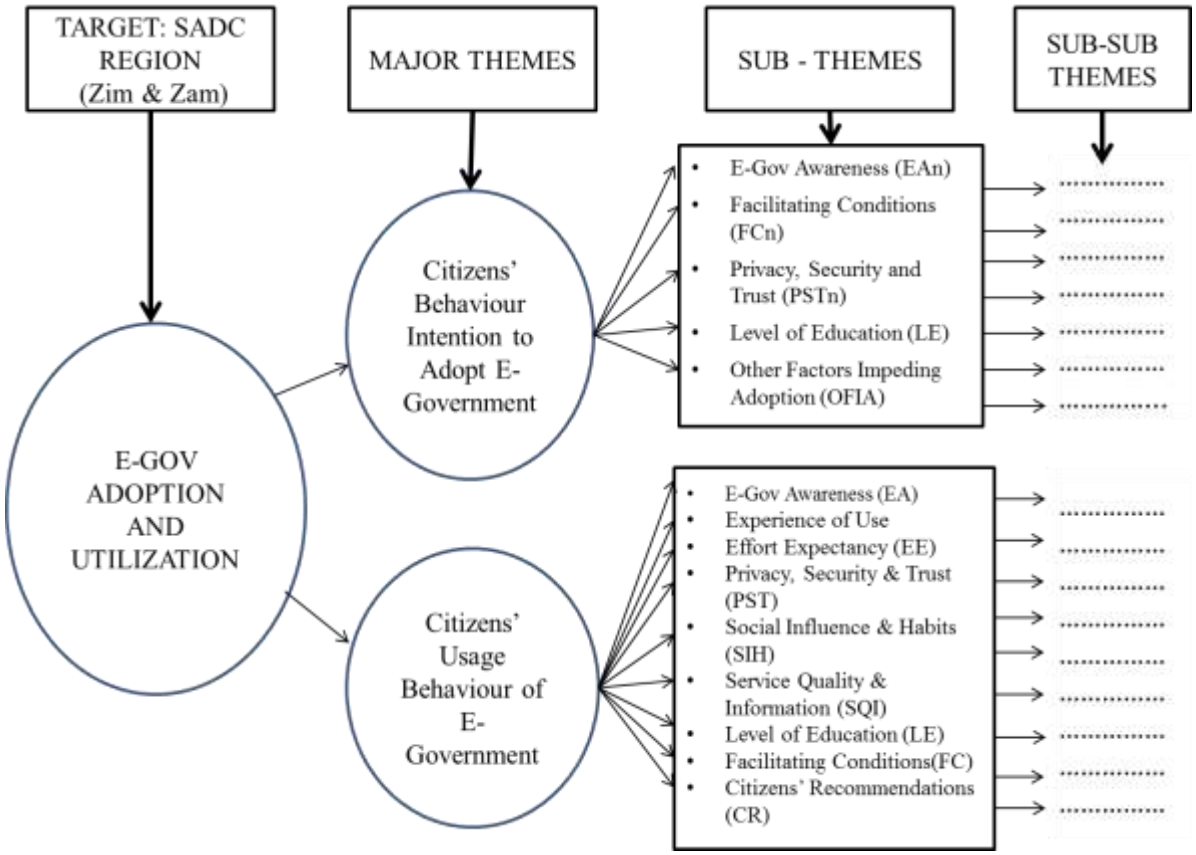


Figure 7- 2: Themes used for the study

7.4.3 Procedures Adopted for Coding Interview data for Nvivo Analysis

This study adopts Hilal and Alabri's (2013) five steps for applying thematic data analysis using Nvivo software (see Figure 7-3). These steps of qualitative data analysis cover the three phases of analysability, transparency, and usefulness of the Total Quality Framework for executing qualitative data analysis adopted for this study and outlined in Figure 7-1. In section 7.5, the researcher outlines how each of these steps was practically applied to thematic data analysis using Nvivo screenshots in this study.

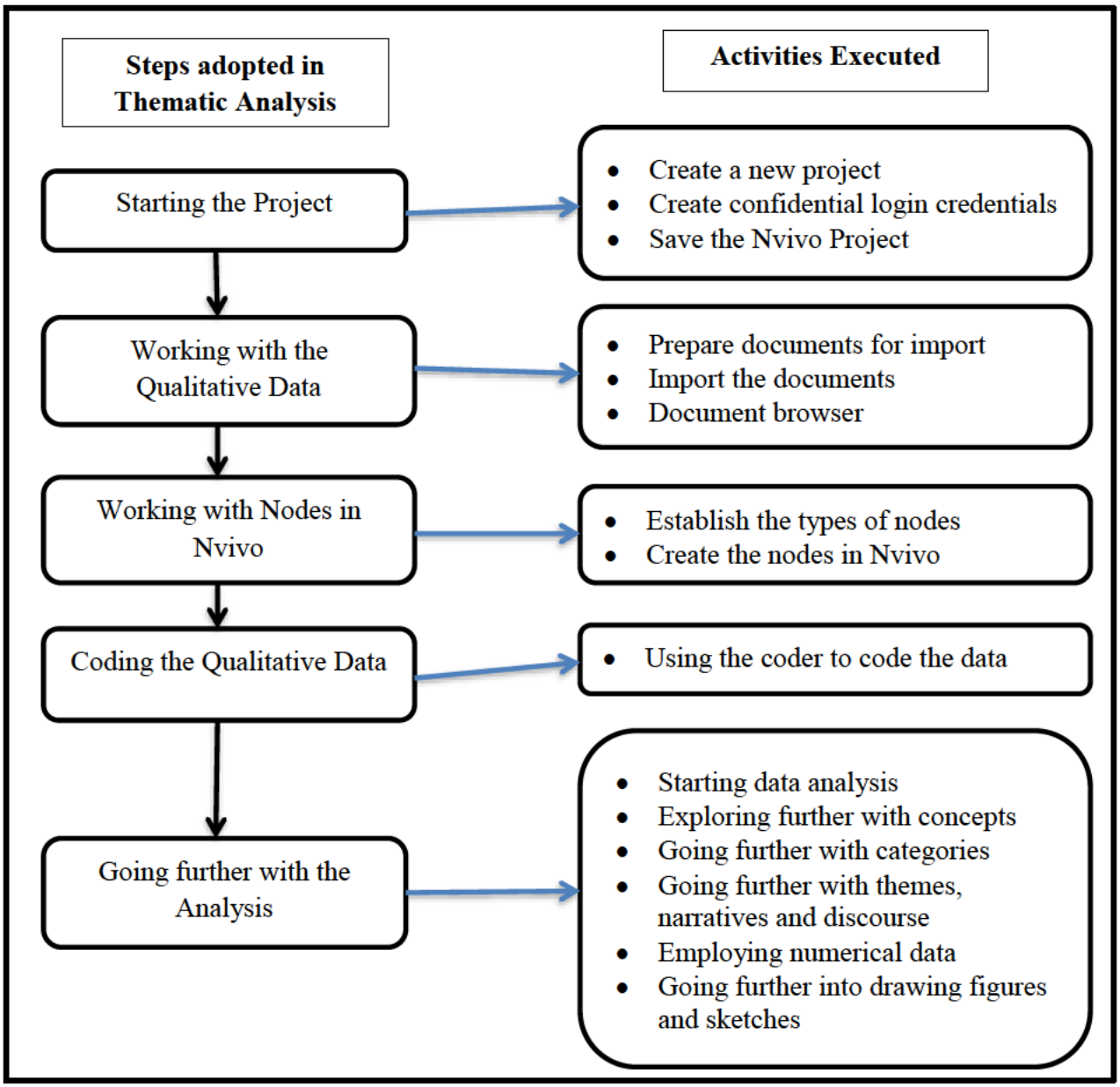


Figure 7- 3: Procedures Followed in Applying NVivo Software (Hilal & Alabri, 2013)

7.5 Thematic Interview Data Analysis

The next section presents the qualitative findings of this study. As indicated earlier on in this chapter, the analysis of interview data was along the themes identified in Figure 7-2. However, it should be noted in this study and in line with Creswell's (2014) recommendation that it is to the discretion of the researcher to determine which of the major constructs discussed in the quantitative data analysis (Chapter 6) deserved a follow-up with interviews.

7.5.1 Starting the Nvivo Project

This study adopted the steps outlined in Figure 7-3 as guidelines for thematic data coding and analysis. This first stage involved creating a new Nvivo project titled 'E-Government Adoption and Utilisation Quali.nvp'. Moreover, the project encompassed all the relevant documents, coding data sets, and information required during the data analysis phase. Furthermore, the researcher created a confidential log-on credential for securing the project and recorded data from unauthorised access.

7.5.2 Working with Qualitative Data

The researcher started by transcribing all audio interview data and stored it into two MS-Word documents in-line with the two major themes outlined in Figure 7-2: 'e-Gov Use Behaviour (Users)' and 'Behavioural Intention to Adopt e-Gov (Non-Users)'. Original audio tapes for each interviewee were also kept for future reference when the need arises during the data analysis process. The researcher then imported the two transcribed MS-Word documents and the audio files as internals into the 'E-Government Adoption and Utilisation Quali.nvp' Nvivo project. Refer to Figure 7-4 for the imported data documents (internals).

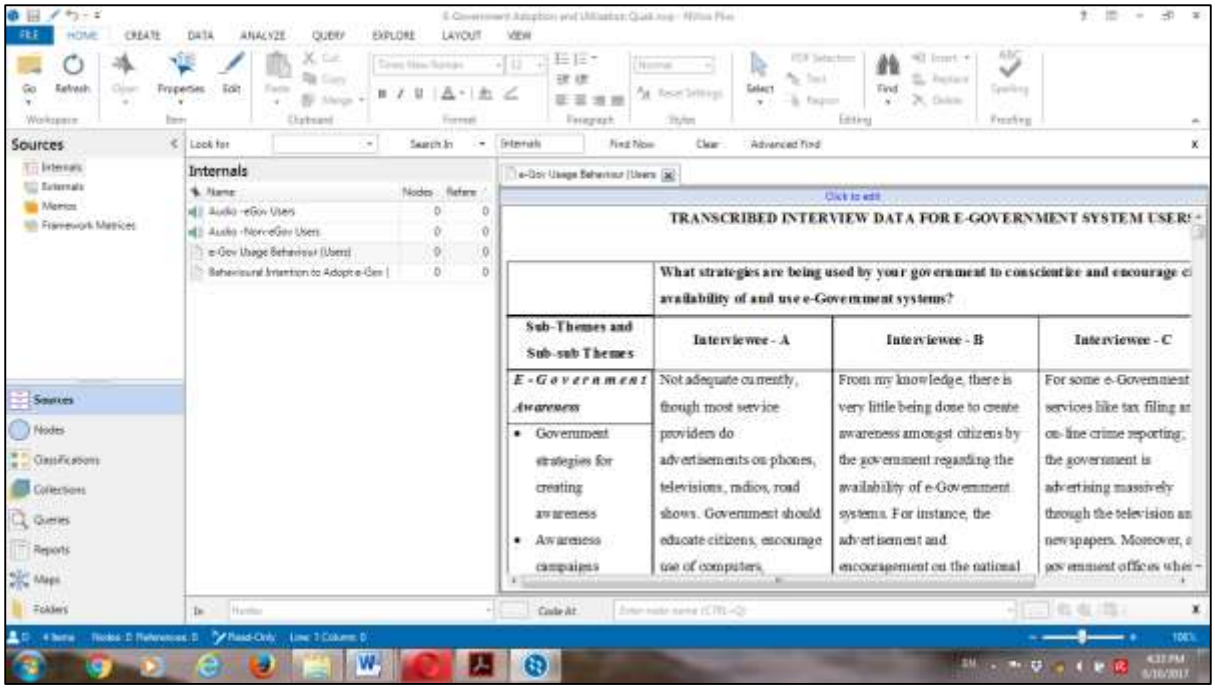


Figure 7- 4: Qualitative Data Internals used in the project

7.5.3 Working with Nodes in Nvivo

In Nvivo QDAS, nodes represent containers for coding the Nvivo project and denote some aspects of the qualitative data, like themes, references, and concepts that identify emerging ideas and patterns (Souza & Souza, 2016). In this study, the researcher used hierarchical coding to code tree nodes (parent and child nodes) to represent the 14 major sub-themes and 55 sub-sub-themes associated with e-government adoption and utilisation of data sets. After several iterations of analysis and querying, the 9 candidate sub-sub-themes had no sufficient data to support them and were dropped off, leaving only 46 final sub-sub-themes for this study. As indicated earlier on in Section 7.4.2 of this chapter, the coded nodes in Figure 7-5 were based on the themes identified in Figure 7-2.

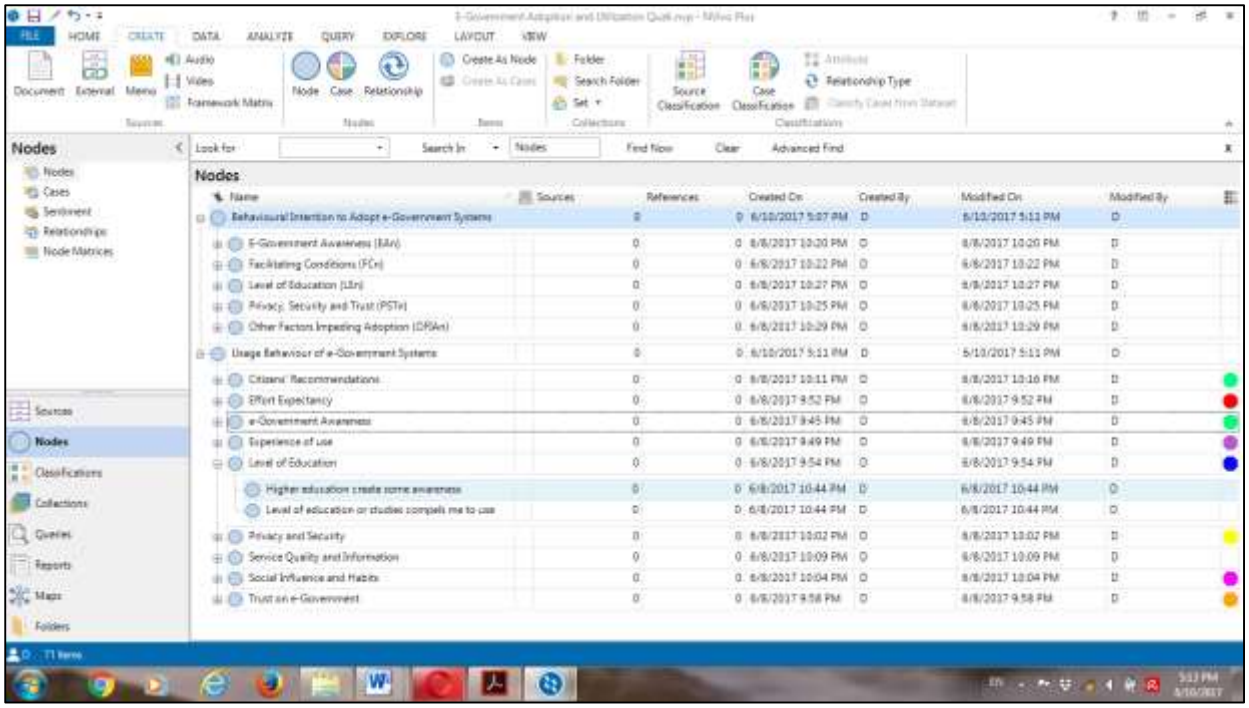


Figure 7- 5: Tree Nodes for the Project

After creating the nodes in Nvivo, the researcher had to define and create relationships existing between and amongst project items (major themes, sub-themes, and sub-sub-themes). Nvivo Project defines relationships in three ways, Associative (e.g. Jacob *knows* Rajesh, and is shown by the symbol '— '); One way (e.g. UKZN *employs* Prof Dick, and is denoted by the symbol '→') and Symmetrical (e.g. Janie *is married to* Hendricks, and is represented by the symbol '↔').

This study used the 'one-way' relationships because all major themes are informed by sub-themes, which in turn are informed by sub-sub-themes. Refer to Figure 7-6 for the visual presentation of the relationships between nodes and internals of the data used in this project.

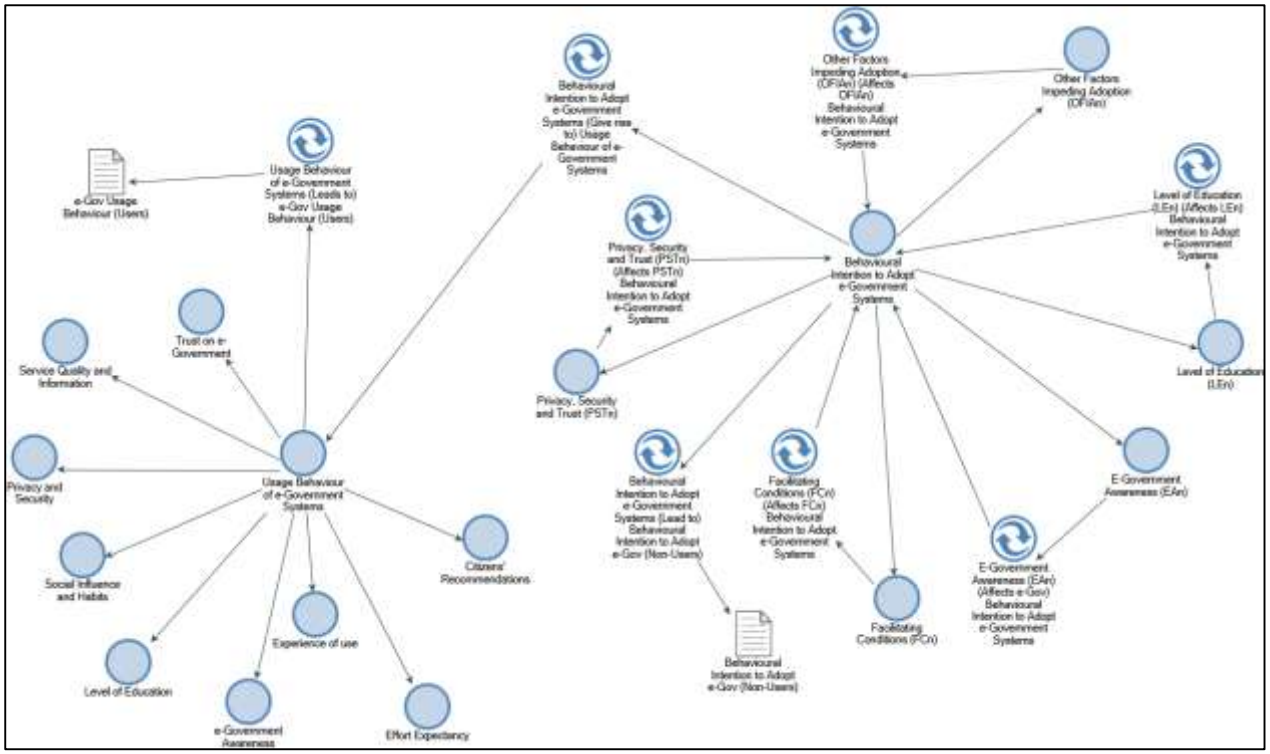


Figure 7- 6: Project Map showing Nodal Relationships

7.5.4 Coding the Qualitative Data

The process of coding qualitative data in Nvivo project involves associating specific chunks of data in the imported documents in the internals with particular nodes. In this study, the researcher coded the data by highlighting interview data for specific interviewee in the two internals and then dragging it into specific nodes. The moment the highlighted interviewee text was the specific node, it changed its colours and coding stripes were automatically created to the far right side of each browser as shown in Figure 7-7 below. The researcher recursively coded the data for the entire nodes, relationships and node classifications using the same approach. Once this process was completed, all respective interviewee responses were associated with respective nodes (which in turn were associated with themes and questions asked).

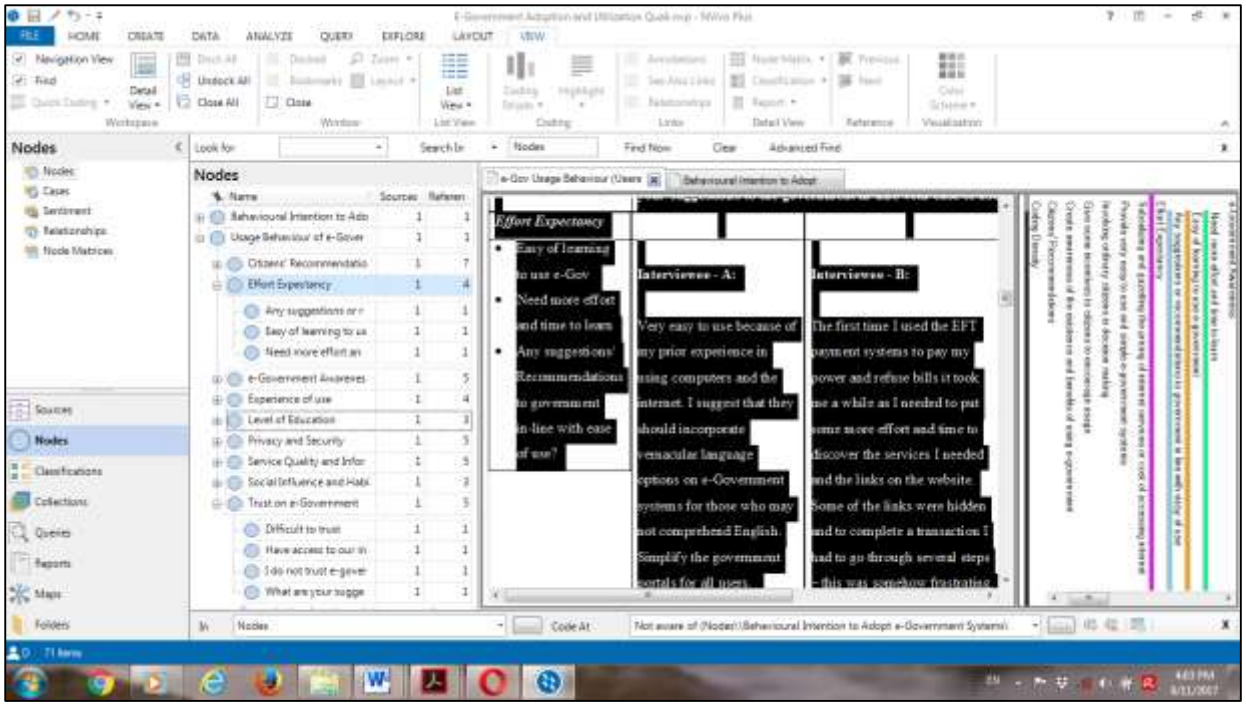


Figure 7- 7: Nvivo Coding Process for the Project

7.5.5 Going further with the Analysis

At this stage, the researcher commenced analysing the qualitative data, paying particular attention to creativity, rigour, flexibility, and awareness of imaging concepts, themes, and surprises. The researcher relied heavily on Nvivo Query options for creating the compound query coding schemes used in this study. The compound query works by discovering text content in the data set (nodes, internals, and relationships) that was closer to the established themes. Therefore, the researcher found the compound queries most suitable for this study because they were more rigour in searching since they combine text search and coding queries. Moreover, this was the best query for analysing interview data sets stored in numerous internals from participants. Creation of the compound query was achieved in three steps as illustrated in Figure 7-8. Step one involved specifying "subquery 1" (i.e. Run a Text search query) and its associated "criteria" (i.e. specified sub-sub-theme text e.g. 'assistance given to citizens, unaware of anything, not aware of anything, the government must do more,' for e-Government Awareness sub-theme). In step two and three the researcher specified the node that was associated with Subquery 2 (Coding Query). In this study, the 'NEAR Content' coding search

operator was used for all queries to search for proximity text in the interview data set to the sub-sub-themes.

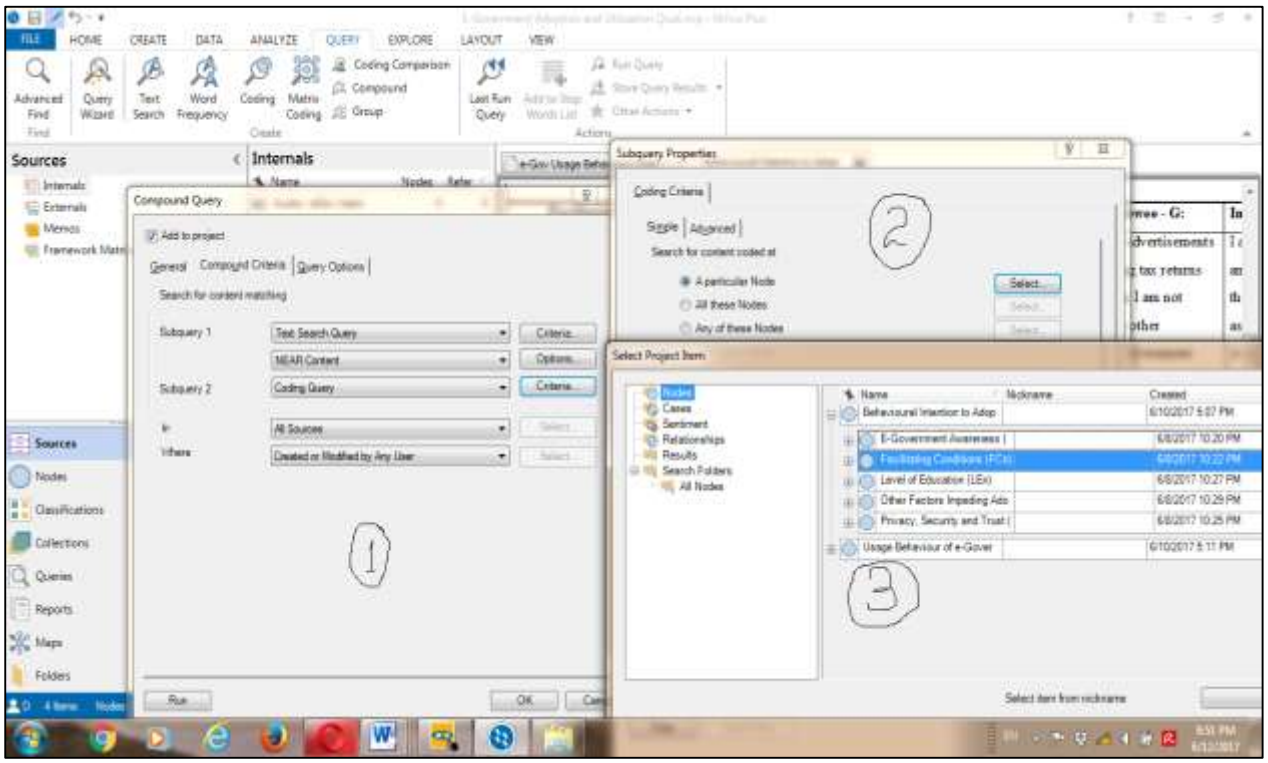


Figure 7- 8: Steps Adopted in Creating Compound Query

7.6 Major Findings of the Study

Findings of this study are discussed along two broad categories, starting with behavioural intention to adopt e-government followed by use behaviour of e-government systems as discussed below.

7.6.1 Behavioural Intention to Adopt e-Government Results

Behavioural Intention to adopt e-government services refers to an individual's motive to accept and adopt a specific e-government service. As already theorised in the PDEGAUM conceptual model (Chapter 3) and mentioned in Chapter 6, behavioural intention to adopt e-government comprises of five core constructs: facilitating conditions, e-government awareness, the level of education; privacy, security, and trust; and other factors. This study sought to establish, based

on interviewees' responses, the effect of these five construct variables on their decisions to adopt e-government services in Zimbabwe and Zambia. Participants P1 to P4 represent interviewees who were not using e-government systems.

Consistent with UTAUT and UTAUT2, citizens' behavioural intentions to adopt e-systems leads to continued utilisation of that e-system. In this regard and in-line with the quantitative results of this study, the next section discusses the qualitative empirical findings.

7.6.1.1 E-Government Awareness (EAn)

E-Government awareness refers to the state of the mind of the general public of being conscious of the existence of public services and products online. Al-Jaghoub et al., (2010) suggest that e-government awareness is a prerequisite for e-government adoption and utilisation; and as such governments should devise effective outreach mechanisms through various media to conscientious and engage citizens on e-government matters. In general, "citizens' awareness of e-government systems and services is notoriously low" and the engagement of e-government intermediaries with on-the-ground tactics to stimulate adoption has been proposed (Dombrowski et al., 2014:4).

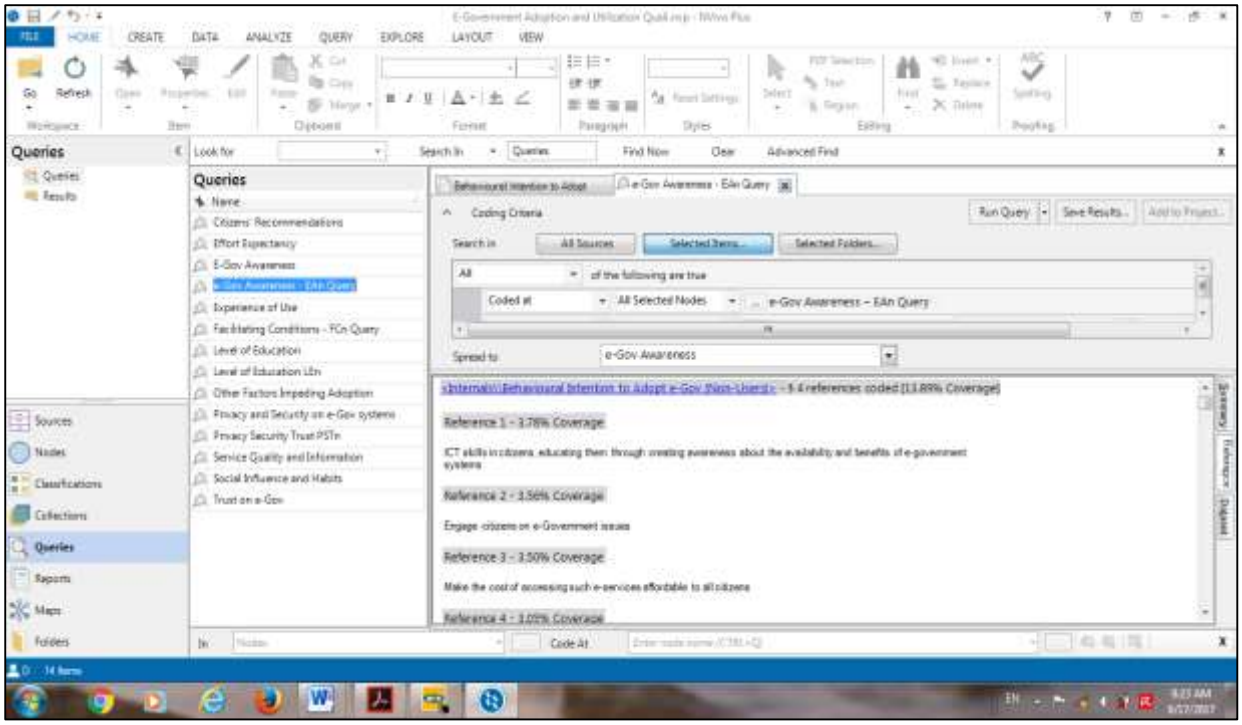


Figure 7- 9: Results related to e-Government Awareness

Consistent with quantitative findings, most interviewees concurred that e-government awareness played a significant role in influencing their behavioural intention to adopt e-government systems.

They cited the lack of government efforts in empowering citizens with ICT skills and conscientisation of citizens about the availability and benefits of adopting e-government systems as illustrated in the queried results in Figure 7-9. For instance, participant P1 suggests that government should develop "…*ICT skills in citizens, educating them through creating awareness about the availability and benefits of*…," of adopting such e-systems. Yet another one said that "…*government should engage citizens*…," on e-government related matters. Moreover, there were resonating concerns regarding the failure to accessing such e-services by some respondents who were using the internet.

7.6.1.2 Facilitating Conditions (FCn)

Facilitating conditions is "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh, et al., 2003:453). Consistent with earlier studies, Venkatesh, et al., 2012 theorised that facilitating conditions have a direct effect on both individual's behavioural intention to use and the actual usage of a system. From the quantitative data analysis, facilitating conditions were found to have a significant effect on citizens' intentions to adopt and utilise e-government services. Based on the qualitative empirical data analysis, the majority of non-users of e-government acknowledged that facilitating conditions played a major role in their intentions and decisions to adopt e-government systems, especially for first-time and very little was being done by the government in this regard. When asked about what actions were being taken or mechanisms put in place by the government to facilitate the smooth adoption of e-government systems, nearly all of the interviewees cited that they were not aware of any initiatives. Participant P2 indicated that: "… *I am not aware of anything being done by the government to assist citizens to use* …" such e-services. Moreover, the majority of the respondents suggested that the government should take initiatives to assist, motivate and equip citizens with the right skills required to adopt and use e-government systems. Figure 7-10 outlines the queried results for the facilitating conditions node.

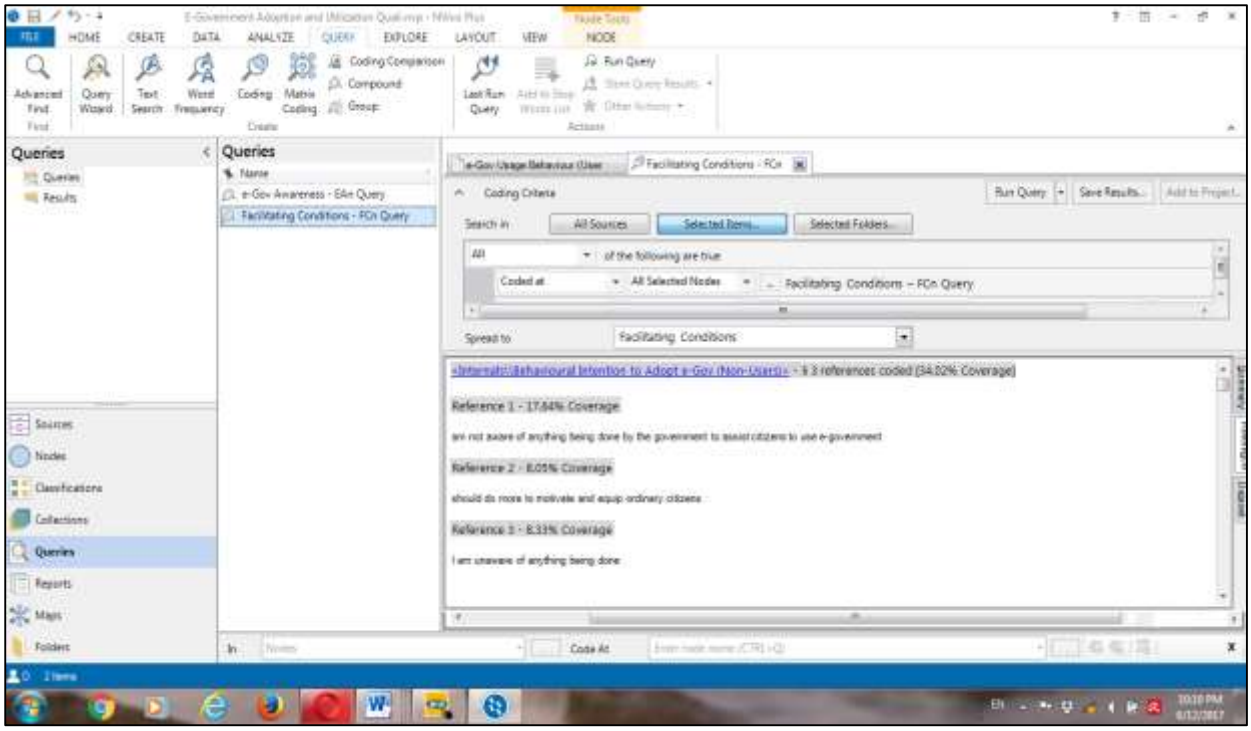


Figure 7- 10: Results related to Facilitating Conditions (FCn)

7.6.1.3 Privacy, Security and Trust (PSTn)

As already indicated in Chapter 3, the construct of privacy, security, and trust is a compound construct measuring three related aspects. According to Papadomichelaki and Mentzas (2012), trust is a combination of privacy and security. It measures the confidence that citizens have on government websites concerning the lack of restrictions, the absence of risk and any doubts about information censoring (Zhao & Zhao, 2010). Privacy is concerned with safeguarding the personal information of e-government users, ensuring that no unauthorised dissemination of personal information takes place, guarding anonymity, safe "archiving of personal data, and providing informed consent" (Papadomichelaki and Mentzas, 2012:101). Lastly, security is the safeguarding of transactions of e-government users against fraudulent activities that may lead to citizens lacking trust in e-government services (Shalhoub, 2006).

This is an essential construct that affects both users and non-users of e-government and according to the UN E-Government Survey (2016); this is exacerbated by a government's track record of governance. The quantitative results revealed that privacy, security, and trust significantly influenced citizens' behavioural intentions to adopt e-government systems in Zimbabwe and Zambia.

The qualitative results revealed some mixed sentiments between those interviewees who had used e-government before and those that had not used. Interviewee P4 echoed that since they had not used e-government in their lives, privacy, security and trust "… *had no effect on intention to adopt*" such e-systems. Similarly, one of the respondents who had used the internet cited the perceived "*... lack of security and privacy…*" on transactions and personal information as major factors affecting their intentions to adopt e-government systems. See Figure 7-11 for a summary of the queried Nvivo results. Such disparities in opinions between users and non-users show that deviant impact that privacy, security and trust had on citizens, and suggests that governments should strive to secure e-government systems to gain their trust.

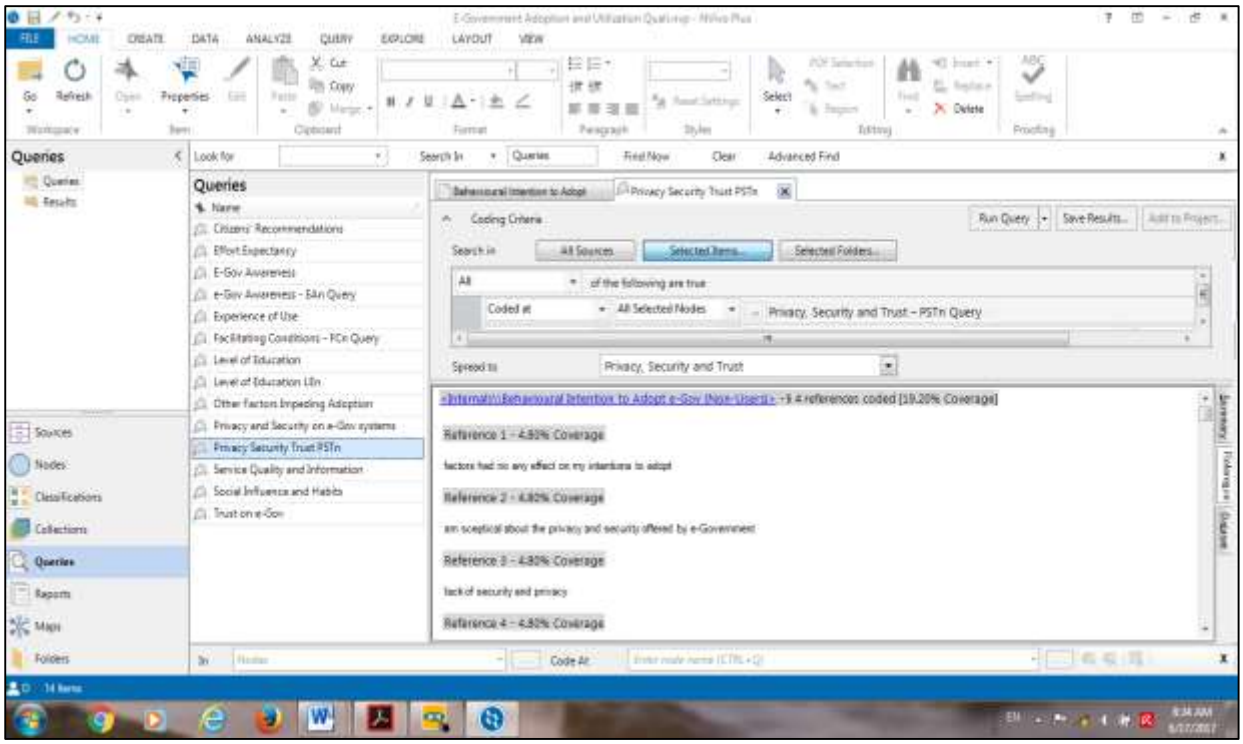


Figure 7- 11: Results related to Privacy, Security, and Trust (PSTn)

7.6.1.4 Level of Education (LEn)

As already been noted in chapter 2 and emphasised by Venkatesh, Sykes, and Venkatraman (2013), the adoption and utilisation of e-government systems demand some level of education and internet skills. Fernández-i-Marín (2011) however, cautioned that the rise in internet access by numerous citizens does not necessarily lead to increased adoption and utilisation of e-government system because some internet users may find e-government systems more complex to use and thus, slowly adopts or shun such systems. The majority of the interviewees in this

study acknowledged that their level of education had an impact on the intentions to adopt e-government. Interviewees P3 said *"... my level of education had some influence..."* on his intention to adopt *"... since it creates some level of awareness"* of the existence of e-government systems. This means that the usage of e-government systems requires some certain level of knowledge.

7.6.1.5 Other Factors Impeding Adoption

The participants for this study were asked to outline any other factors that could be dramatically hampering their intentions to adopt e-government systems and numerous factors resonated as illustrated in the Nvivo queried results in Figure 7-12. The analysis of results from the interviewees revealed widespread sentiments that there was little awareness amongst citizens regarding the existence of e-government systems, lack of knowledge of the benefits derived from using e-government, lack of relevant technical skills to use the internet and e-government systems, the high cost of acquiring ICT devices and that of accessing the internet. Importantly, many non-users participants voiced the absence of vernacular language options on the internet and e-systems to facilitating accessibility by the wider citizenry.

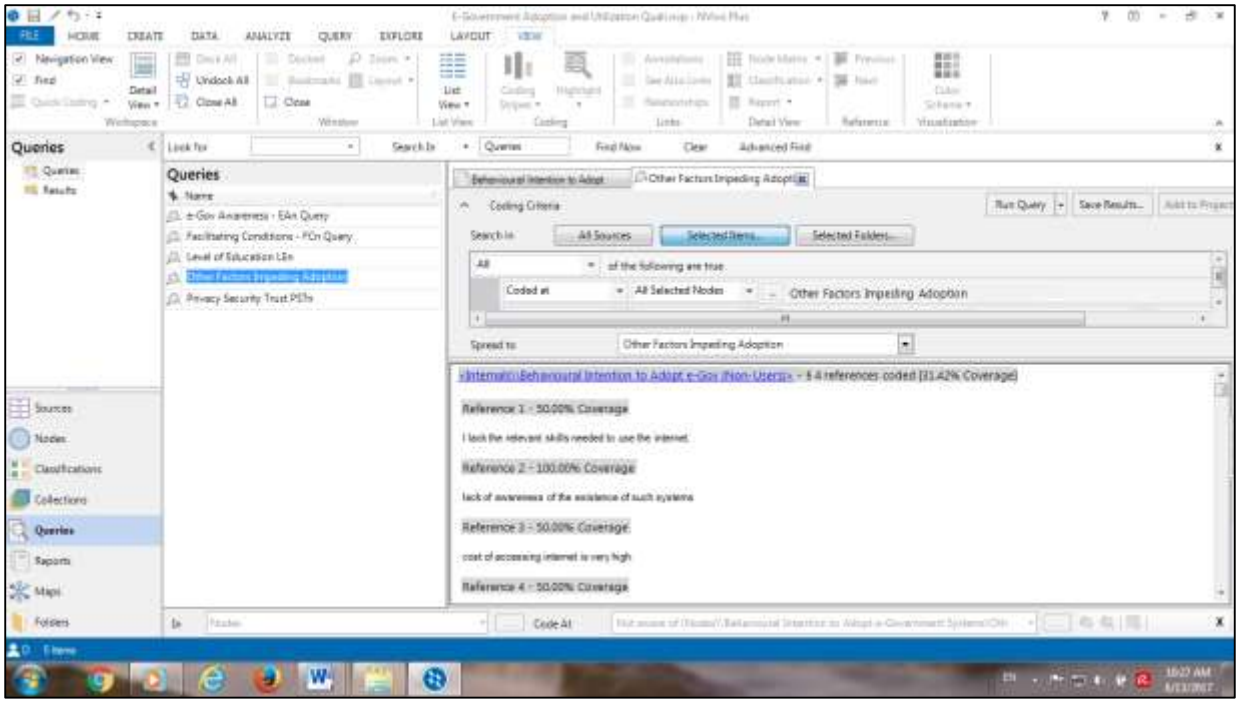


Figure 7- 12: Other cited factors affecting e-Government Adoption

7.6.2 E-Government Utilisation Behaviour Results

In this study use behaviour of e-government systems refers to the citizen's frequency of using e-systems. This qualitative strand of the explanatory sequential mixed methods approach investigates seven fundamental constructs affecting citizens' e-government utilisation behaviour. These factors are e-government awareness; effort expectancy; social influence and habits; privacy, security, and trust; the experience of use; service quality and information; other recommendations. In an effort to understand how these factors have influenced citizens' levels of utilisation of e-government systems in Zimbabwe and Zambia, interviewees' viewpoints are illustrated next. Participants P5 to P8 represent interviewees who had previous experience in using e-government systems.

7.6.2.1 E-Government Awareness

As mentioned earlier on in this study, e-government awareness positively affects citizens' intention to adopt and utilise e-government services. In the language of Dombrowski et al., (2014:4) e-government awareness "refers to how familiar or conscious an individual is of a particular service or e-government initiative, including how familiar one is with the benefits that a particular service might provide." From the quantitative results, e-government awareness was found to have a positive influence on user behaviour of citizens.

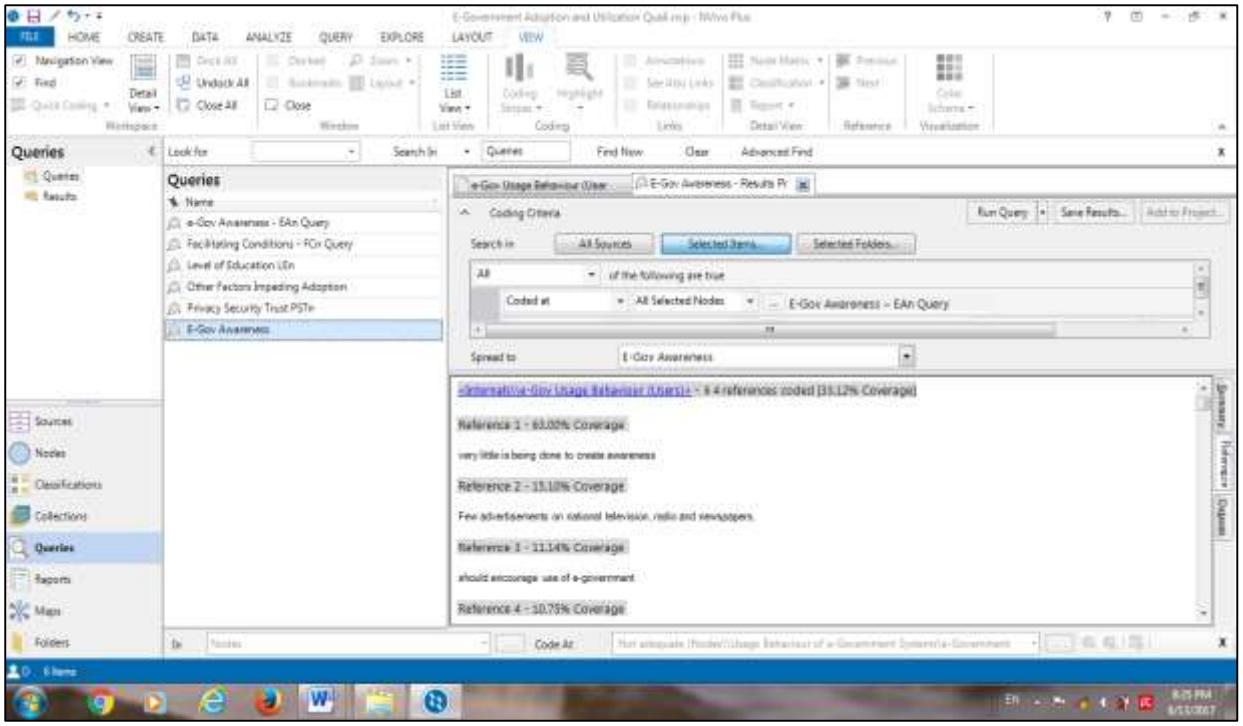


Figure 7- 13: Effect of e-Government Awareness on Utilisation

With the focus on qualitative findings, as illustrated in Figure 7-13, it emerged that the majority of interviewees concurred with the notion that awareness plays a major role in their decisions to continuously use e-government systems. For instance, when asked for opinions regarding actions and strategies that were being taken by their government to create awareness and encourage citizens to use e-government systems, the majority of interviewees voiced that their government is not doing much to assist them to use such systems. For instance, Participant P5 said that *"…very little was being done to create awareness…"* through *"…advertisements on national television, radio, and newspapers."* In the context of Zimbabwe, the majority of interviewees have attributed the widespread utilisation of Ecocash money transfer and e-payment system to the widespread shortage of hard cash and its acceptance by the majority of citizens (even in rural areas) and the business sector. These sentiments underscored the importance of creating awareness in order to persuade citizens to utilise e-government systems as confirmed by Venkatesh et al., (2012).

7.6.2.2 Effort Expectancy

Effort expectancy refers to the extent to which e-government systems allow the convenience of usage to citizens (Venkatesh et al., 2003). Al-Qeisi, Dennis, Hegazy, and Abbad (2015) suggest that effort expectancy has a significant effect on citizens' behavioural intention to adopt e-government in the early phases of the adoption process as opposed to use behaviour. Furthermore, Al-Qeisi et al., (2015) maintain that as one becomes familiar with and consistently use an e-system, the influence of effort expectancy tends to deteriorate. However, the quantitative results in Chapter 6 of this thesis established that perceived ease of use (effort expectancy) of e-government systems positively affects citizens' utilisation of e-government systems.

The analysis of interview results concurred with the quantitative findings by showing that effort expectancy is one of the notable factors influencing citizens' use behaviour of e-government systems. Participant P6 agreed that even if she *"... had some experience in using the internet..."* she had to *"... put some effort and time to learn the systems and discover ..."* the required services on e-government websites. Moreover, the majority of the respondents agreed that e-government systems were uniquely designed and as such, they should be as simple as possible to use for the average citizen, have web accessibility features like language options, blogs, frequently asked questions (FAQs) sections and introduce basic computer literacy skills starting from primary school levels.

7.6.2.3 Social Influence and Habits

The social influence and habits construct are made up of two related aspects: social influence from associates and then one's habits. According to Venkatesh et al., (2003) and Al-Qeisi et al., (2015), social influence refers to the extent to which an individual considers as crucial the views and beliefs of those people close to him/her when deciding to use an e-government system. On the other hand, habits define "the extent to which people tend to perform behaviours automatically because of learning" (Venkatesh et al., 2012:161). Therefore, the habit can be operationalised in two ways; firstly, as a prior behavioural intention for use (Kim & Malhotra, 2005) and secondly as the degree to which one considers such behaviour as automatic when deciding to use an e-system (Limayem, Hirt & Cheung, 2007). Venkatesh et al., (2012) suggest

that an individual's prior use of an e-system is a strong predictor of that person's future e-system use.

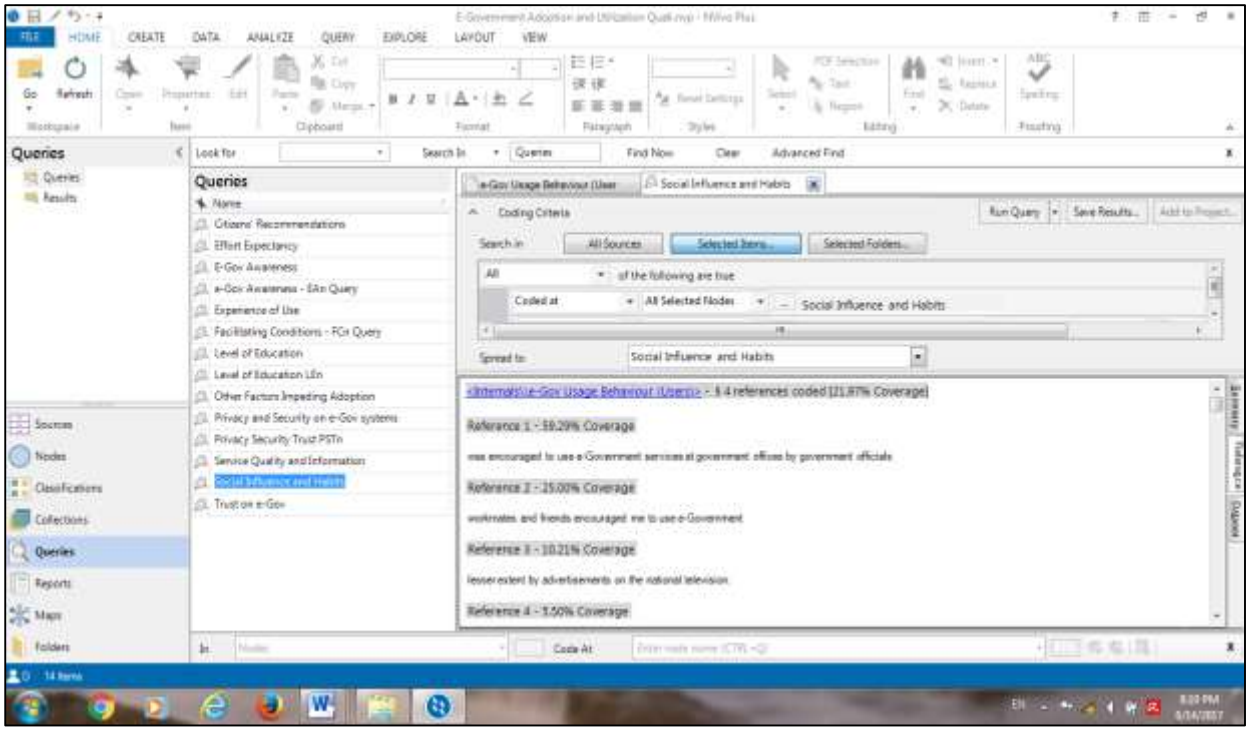


Figure 7- 14: Effect of Social Influence and Habits on Utilisation

Similarly, social influence and habits were viewed by several interviewees as one of the foremost drivers of e-government system utilisation, as it builds on other people's perceptions and prior satisfaction to create one's own perception of a particular e-system. The queried Nvivo results (Figure 7-14) demonstrate that the major source of social influence emanated from friends, relatives, government officials, workmates and advertisements on television. In line with such finding, participant P7 expressed that *"... I was influenced mainly by my fellow friends at the University," "...relatives..."* and to a "*…lesser extent by advertisements on the national television"* to use e-government systems. In-line with habits, the majority of interviewees indicated that their prior exposure and ICT learning had an influence on their use behaviour. Therefore, the qualitative findings of this study confirm the quantitative results in Chapter 6 which established that social influence and habits significantly influenced citizens' decisions to continuously use e-government systems in Zimbabwe and Zambia.

7.6.2.4 Privacy, Security and Trust

As already established in Chapter 3, perceived lack of privacy, security, and trust in e-government systems significantly affect citizens' use behaviour of e-government systems; such that the effect is much stronger with first-timer and non-regular users. Alzahrani, Al-Karaghouli, and Weerakkody (2016) suggest that in the G2C interactions, citizens' trust in e-government systems influences their use behaviour of such systems and if positive, it will lead to continued utilisation. Citizens are always posting online personal and confidential information and as a result, such websites should offer robust security against cyber-attacks and theft. From the quantitative results, privacy, security, and trust had a significant effect on e-government system utilisation.

In interpreting the qualitative data, the majority of interviewees agreed that in view of numerous cyber crimes being reported, they have little trust on e-systems. Interviewee P8 said I *"… do not trust e-government systems…"* since I do not know what the information he provides will end up being used for. Similarly, the majority of the participants asserted that although they often use e-government systems, they acknowledged that privacy and security issues remain a major concern. They argued that these factors play a major role when one is using an e-system regardless of whether it is for the first time or one is experienced. From this study, it emerged that several interviewees felt that in order to instil trust in citizens regarding the privacy, security and the general uptake of e-government systems, the government should engage citizens for input into e-government matters before system implementation. Participant P7 outlined that government should *"… have in place effective legal structures…"* to deal with e-government privacy and security perpetrators and should *"…give some guarantees to citizens…"* that e-government systems are secure.

7.6.2.5 Experience of Use

Venkatesh et al., (2012) posits that a citizen's prior experience (whether positive or negative) with using a computer, smart device, the internet or e-government system has a significant effect on one's future decisions for utilisation such systems. According to AlAwadhi and Morris (2009:586) citizens who had unpleasant previous experience of using e-government systems thought that such systems "were ineffective and a waste of time", and thus their experience would often deter them from future use. Moreover, Venkatesh et al., (2012) found

that a citizen's positive experience with using a particular e-system will build different levels of habits that prompt that person to keep on wanting to use such a system.

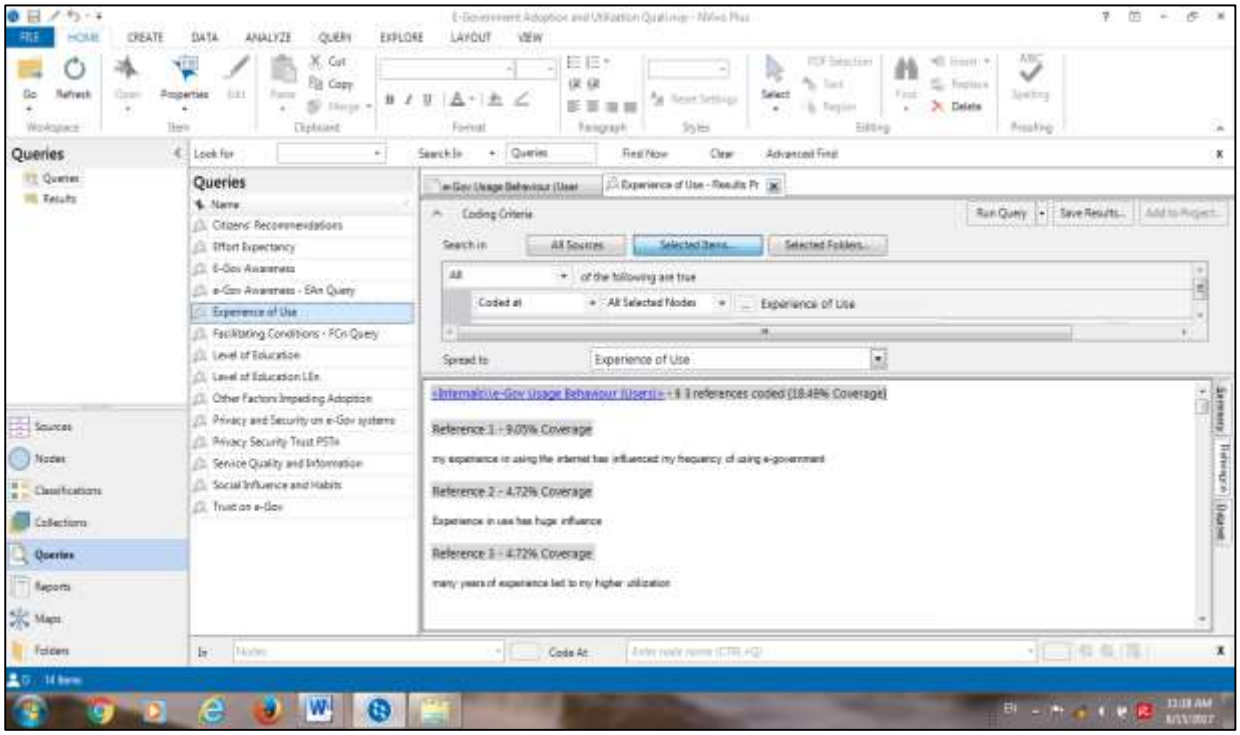


Figure 7- 15: Effect of Experience of use on continued Utilisation

As illustrated in the queried results in Figure 7-15, the majority of the interviewees shared similar sentiments that 'experience of use' is a stronger factor influencing their decisions and habits for using e-government systems. The overall perception amongst interviewees was that a citizen's experience of using the internet and computers played a major role in their utilisation of e-government systems. Participant P6 acknowledged that his *"utilisation of e-government systems is attributed to many years of experience"* that he had been *"… using the internet and computers…"* and this gave him the confidence and technical expertise required to use such e-systems.

7.6.2.6 Service Quality and Information

In the context of this study e-government service quality and information refers to "both website quality and e-service quality" since the common notion is that citizens who visit e-government systems may be looking for particular information and/or a service (Papadomichelaki & Mentzas, 2012:99). As already mentioned in the literature review

(Chapter 2) and echoed in Fan and Yang (2015), users' perception of an e-government quality features (system quality, information quality, and service quality) has a significant effect on their utilisation levels of that e-system. Moreover, Chatfield and AlAnazi (2013) posit that governments should strive to increase citizen satisfaction with e-government systems by providing accurate, complete, timeliness, concise and relevant information on e-government websites. All participants in this study reiterated that the majority of e-government systems they have used provided dependable, accurate and sufficient links to current information. Participant P5 had this to say *"Nearly all of the e-government systems I have used had up-to-date content."* Nevertheless, some participants had a different experience and cited that *"some government websites" … "had outdated information"* and were *"... complex to use."* The qualitative findings confirm the quantitative results of this study which established a significant relationship between service quality and information and e-government use behaviour.

7.6.2.7 Citizens' Recommendations

Towards the end of the interviews, the researcher provided all participants with the opportunity to propose some recommendations to the government regarding what they thought should be done to increase the levels of e-government utilisation by citizens. According to Boyce and Neale (2006), by allowing participants to make recommendations, the researcher tapes into new insights that might not have been covered and asked during the interview process. The following recommendations (as also illustrated in the Nvivo query in Figure 7-16) resonated from the majority of the interviewees:

- Government should create awareness of e-government systems amongst citizens
- Develop some ICT skills in citizens through training
- Create awareness amongst citizens on the benefits of using e-government systems
- Provide very easy-to-use and simple e-government systems
- Regulate and make allowable the cost of accessing internet and data bundles
- Engage citizens on e-government matters to increase acceptance and utilisation
- Incorporate vernacular languages on e-government websites to increase accessibility by the broader citizenry.
- Establish intermediaries like internet and e-government kiosks at the local community level to assist citizens to access and use e-systems at allowable and sometimes no cost.

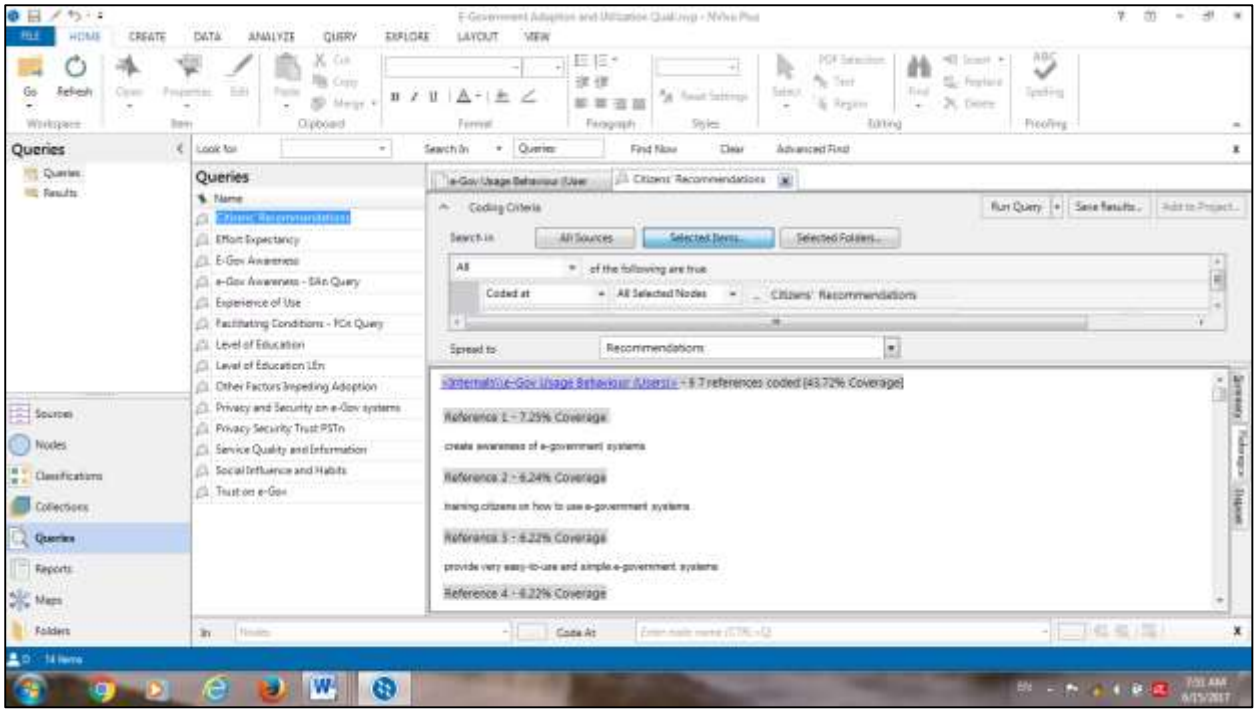


Figure 7- 16: Citizens' Recommendations on e-government utilisation

The above sentiments from participants lay emphasis on the need for the government to put more initiatives in creating awareness and empowering citizens with the right technical skills required for adopting and utilising e-government systems. Table 7-2 summarises the major lessons learnt from the qualitative study for each of the investigated aspect linked to the construct variables investigated in chapter 6.

Table 7- 2: Summary of Major Lessons Learnt for non-users of e-Government

Investigated Factor		Summary of lessons learned from the findings	Source of Reference (Related Literature)
Behavioural Intention to Adopt e-Government (for non-users and irregular users)	E-Government Awareness	E-Government awareness substantially affects citizens' behavioural intention to adopt e-government systems. Major cited factors by citizens included the lack of conscientisation of citizens on the availability and benefits of using e-government services and to involve citizens in e-government matters.	Venkatesh, et al., (2012); Dombrowski et al., (2014); Voutinioti (2013); Al-Jaghoub et al. (2010); Cai Shuqin et al., (2016). Literature review ((§ 2.5.2; § 3.7)
	Facilitating Conditions	Unavailability of facilitating conditions was widely acknowledged amongst many participants as impeding e-government adoption. Governments are not doing enough to assist and motivate citizens to adopt e-government systems.	Al Salmi and Hasnan, (2016:36); Venkatesh, et al., (2012); Al-Shboul, et al., (2014); Prasad, (2012). Literature review (§ 3.4.5)
	Privacy, Security, and Trust (PST)	Citizens do not trust e-government systems due to perceived lack of security and privacy to personal information and transactions. Recent incidents of security breaches through cyber attacks were cited as evidence. PST had no impact on non-adopters.	Cai Shuqin et al. (2016); Venkatesh et al., (2016); Papadomichelaki and Mentzas (2012). Literature review (§ 3.2)
	Level of Education	The level of education had an effect on behavioural intention to adopt e-government systems as it created some level of technical aptitude required to adopt and awareness of the existence of such e-systems.	Venkatesh et al. (2013); Fernández-i-Marín, (2011); Rodríguez-Domínguez et al., (2011). Literature review (§ 3.1)
		Other major factors cited as hindering e-	*(continues)*

	Other Factors Impeding Adoption	government adoption by citizens include among others: lack of awareness of e-government systems, lack of relevant skills to use the e-system, the high cost of accessing the internet, unallowable ICT devices with access to the internet and e-government.	Literature review (§ 2.4.2; §2.5.3; §2.6.2; §2.7.2). Sorn-in et al., (2015); ALotaibi et al., (2016); Otieno and Omwenga, (2016).

Table 7- 3: Summary of Major Lessons Learnt for e-Gov users (*continues to Table 7-4*)

E-Government Use behaviour (for users)	E-government Awareness	Governments are doing very little to create e-government awareness to citizen Few of the awareness strategies currently being used include among others; advertisements on national television and radio stations, and in newspapers.	Dombrowski et al., (2014); Weerakkody et al., (2013); Linders (2012); Nkwe (2012). Literature review (§ 2.5.2)
	Effort Expectancy	Little effort is required to use e-government systems with citizens with prior experience. However, to increase usability and accessibility the following suggestions were made: simplistic user interface design, incorporate web customization features like language options, develop basic ICT skills in citizens.	Sultana, Ahlan, and Habibullah (2016); Van, Kim, Sa, Kim and Gim (2016); Al-Qeisi et al., (2015). Literature review (§ 3.4.5)
	Social Influence and Habits	Social Influence and habits are very crucial in influencing citizens' decisions to utilise e-government systems in clique-setups like workplaces, family, universities and social groups. Reference and recommendations from a trusted person have a significant bearing on one's decision for using e-services.	Venkatesh et al., (2012:174); Limayem et al., (2007); Al-Qeisi et al., (2015). Literature review (§ 3.4.5).
	Privacy, Security, and Trust	Robust privacy and security are essential features for building citizens' trust on e-government systems. To increase e-government utilisation, the systems should be secure from cyber-attacks.	Alzahrani et al., (2016); Beldad et al., (2012); Hussein et al., (2010). Literature review (§ 3.2)

Table 7- 4: Summary of Major Lessons Learnt for e-Gov users (*continues from Table 7-3*)

E-Government Use behaviour (for users)	Experience of Use	The experience of using computers, the internet, and e-systems is very crucial in building the confidence and skills required for using e-government systems.	Venkatesh et al., (2012); AlAwadhi and Morris, (2009). Literature review (§ 3.1)
	Service Quality and Information	Maintaining updated, accurate, complete, timeliness, concise and relevant information on e-government systems is essential to encourage e-service utilisation. Simplistic e-government system design has been identified as another motivating factor for utilisation.	Sá, Rocha, and Cota (2016); Chatfield and AlAnazi (2013); Papadomichelaki and Mentzas (2012); Detlor et al., (2013). Literature review ((§ 2.1; § 3.7)
	Citizens' Recommendations	Major recommendations advocated by participants for promoting e-government utilisation include among other; creating awareness, imparting citizens with the right skills, create awareness amongst citizens on the benefits of using e-government, make internet cost allowable to ordinary citizens, provide simple and easy to use systems, and engaging citizens for input into e-government matters.	Albesher, (2015); Bwalya (2017); United Nations. (2016); Alomari (2014); ALotaibi et al., (2016)

7.7 Chapter Summary

This chapter presented empirical qualitative data collected from individual participants using semi-structured interviews. The qualitative inquiry was undertaken as the second phase of the explanatory sequential mixed methods approach aimed at validating and exploring further the quantitative result in Chapters 5 and 6. Moreover, this chapter was aimed at gaining an in-depth understanding of citizens' perceptions and perspectives regarding factors affecting their intention to adopt and utilise e-government systems in-line with the PDEGAUM conceptual model proposed in Chapter 3. In the presentation, the researcher clearly distinguished between what was said by the interviewees, what the literature suggested and the researcher's reflections on the findings. Qualitative data analysis was done along two broader, but interrelated themes, namely behavioural intention to adopt e-government and use behaviour of e-government. Overall, the findings from the eight interviewees who had previously participated in the quantitative survey confirm the quantitative results; which emphasised that the PDEGAUM model was suitable and contribute towards meeting the aim of this study. From the findings, it was established that certain factors influenced citizens' behavioural intention to adopt e-government (especially new and irregular users) more as compared to citizens' use behaviour (associated with frequent e-government users).

In the next chapter (8), the researcher provides a discussion of findings of this study emerging from the literature review (Chapters 2 and 3) and from both the quantitative (Chapters 5 and 6) and qualitative (Chapter 7) strands of the explanatory sequential mixed methods approach adopted in this study. The discussion will be in light of the PDEGAUM conceptual model underpinning this study with the view of refining it based on the findings.

Chapter 8: Discussion of the Findings

Chapter Overview

This chapter is aimed at discussing the results of this study as reported in chapter 5, chapter 6 and chapter 7 in relation to the research questions proposed in chapter 1 and hypotheses advanced in chapter 3. The corpus of literature presented in chapters 2 established four major research gaps which are theoretical (lack of all-inclusive e-government adoption and utilisation models), contextual (limited studies on e-government utilisation in the context of Zambia, Zimbabwe and the SADC region at large), empirical (few case studies using mixed methods research) and substantive (lack of empirically-tested e-government utilisation models as guidelines for policymakers in decision-making process). Considerable studies have been undertaken towards understanding e-government initiatives in the SADC region. However, the majority of these studies were inclined towards e-government readiness assessment, implementation and adoption independently, thus contemporary studies proposing theoretical models that combine adoption and utilisation remains subdued. Therefore, this study investigated these concerns so as to provide a comprehensive understanding of factors affecting the adoption and utilisation of e-government systems by citizens in the SADC region.

The aim of this study was to develop a People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model that took into account the major factors affecting citizens' decisions to adopt and utilise e-government systems in the SADC region. This chapter, therefore, seeks to synthesise the PDEGAUM conceptual model proposed in chapter 3 based on the significant factors proven by the empirical findings of this study and the literature review. The end goal of this chapter is a revised PDEGAUM conceptual model that demonstrates the interplay of factors that promote the adoption and utilisation of e-government systems emanating from the interplay of people-driven and supply-driven initiatives in the SADC region. The PDEGAUM conceptual model provides an essential tool that can be used by decision and policy makers considering adopting new e-government systems or when seeking ways to promote the utilisation of existing e-systems by citizens.

8.1 Reflection on the PDEGAUM Conceptual Model

The extended Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al. 2012), and the ITU e-Government Implementation Toolkit Framework (ITU, 2009) underpinned this study. The corpus of literature presented in chapters 3 revealed that the UTAUT2 model is the successor to the UTAUT model and both seeks to explain behavioural and technological factors that promote or hinder the adoption and use of technology by people (Alshehri et al., 2012). Contrasting the two models, UTAUT2 has its focus on understanding e-system adoption and utilisation in the government-to-citizens (G2C) and business-to-citizens (B2C) domains whilst the UTAUT was intended for the government-to-employees (G2E) and business-to-employee (B2E) domains. Against the background that this study sought to understand factors that influence citizens' behavioural intention to adopt and use e-government systems; the UTAUT2 model was found to be a more pertinent theoretical lens.

Moreover, it emerged in chapter 2 that most e-government systems in developing countries arise from the supply-driven side by government efforts with little consideration of citizens' inputs. In that context, the ITU e-Government Implementation Toolkit Framework was selected as the most appropriate tool for use in explaining governments' efforts towards rolling out and promoting e-government utilisation. In-line with the UTAUT2 model, the ITU e-Government Implementation Toolkit Framework and based on the corpus of literature presented in chapter 2 and chapter 3, this study distilled and links socio-economic, political and behavioural intentions to use aspects with e-system acceptance to determine e-government system utilisation by citizens. Therefore, in order to adequately answer the research questions and establish the significance of the proposed hypotheses; the UTAUT2 model and the ITU e-Government Implementation Toolkit Framework were refined and amalgamated into the PDEGAUM theoretical model proposed for this study. The PDEGAUM model can be used as a decision-making tool by policymakers and administrators when adopting new or when promoting the utilisation of existing e-government systems. The model provides a framework, with numerous constructs that could be expanded upon and deliberated on in-conjunction with citizens to realise some key aspects to focus on before actually rolling out any new system. Frameworks, just like a mechanic's toolbox provides some mechanisms through which key decisions could be made to establish the roadmap for e-government systems.

8.2 General Discussion of the Findings

This study hypothesised that the intention to use e-government systems was moderated by demographic differences characterising the potential users. Chapter Five of this study was dedicated to answering this supposition along two categories of e-government users and non-users of e-government systems.

Chapter Five began with an overview of the structure of the research questionnaire, followed by an outline of all the major preliminary data analysis steps undertaken. These include data cleaning and screening procedures which were done to remove any possible errors, identifying missing and duplicate data values, establishing and dealing with common methods bias, detect and eliminate any possible outliers and univariate normality that could distort the final results. There were 765 fully completed questionnaires returned for data analysis out of the possible 800 questionnaires distributed to respondents. Out of these 765 responses, 489 respondents were using e-government systems whereas 247 were not. This gave an overall response rate of 96.5%, which was considered satisfactory and far above the minimum acceptable response rate of 30% for any survey (Sekaran, 2003). The next step was to define and develop variables in the IBM SPSS software, followed by data entry, and then dealing with univariate normality through establishing whether the skewness and kurtosis of variable constructs were within acceptable ranges. The findings confirmed that all construct variables were within the ±3 acceptable range (Kim, 2013). Findings of this study have shown that there were no cases of outliers within the data set. A detailed description of descriptive statistics is provided in Chapter 5.

In Chapter 6 the validity and reliability of the study instruments and findings were achieved through various mechanisms. Notably, Cronbach's Alpha (Cronbach, 1951) test was used to evaluate the internal consistency of the construct variables and the results of this study showed that the study instrument was reliable with almost all values above the recommended value of 0.70 (Hair et al., 2014). Two constructs EE (0.689) and USE (0.679) had their Cronbach's Alpha values closer to the minimum recommended value (0.70) and the researcher decided to include them in the further statistical analysis. Construct validity analysis was performed to test if all hypothesised constructs were actually measuring, appropriately the investigated phenomenon. To achieve this Exploratory Factor Analysis was employed to establish the validity, unidimensionality and correlation coefficients of all the construct scales.

Moreover, Confirmatory Factor Analysis (CFA) using Structural Equation Modelling (SEM), specifically relying on the IBM SPSS Amos version 24 was used to ascertain whether the PDEGAUM hypothesised model (both measurement and structural aspects) for the study fits the data well. Overall, the findings confirmed that the PDEGAUM model fits the collected data.

Chapter 7 presented empirical qualitative data undertaken as the second phase of the explanatory sequential mixed methods approach aimed at validating and exploring further the quantitative result in Chapters 5 and 6. The Total Quality Framework (TQF) provided a comprehensive tool used for generating, organising and interpreting the qualitative data. Specifically, four measures of the TQF (credibility, analysability, transparency, and usefulness) were used to measure and achieve the quality of the qualitative strand of this research. Overall, the qualitative findings confirmed the quantitative results; which underscored that the PDEGAUM model is suitable and contribute towards meeting the aim of this study.

8.3 Hypotheses Testing

The seventeen hypotheses proposed in chapter 3 in line with the suggested PDEGAUM theoretical model are discussed in this section based on the quantitative and qualitative empirical results presented in chapters 5, 6 and 7 respectively. The discussion centres on the role played by each predictor variable in explaining the two dependent variables of behavioural intention to use (BI) and use behaviour (USE) of e-government systems. Additionally, three moderator variables (educational level, language option and experience of use) moderated the two dependent variables. Educational level and language option moderator variables significantly influenced citizens' behavioural intention to adopt e-government systems, while educational level and experience of use influenced use behaviour.

The next sub-sections provide in-depth discussions of the hypotheses based on the findings of this study, starting with moderator-related hypotheses ending with construct variable related hypotheses.

8.3.1 Effect of Level of Education on e-Government Adoption and Utilisation

H1 (a0): *Level of education does not influence behavioural intention to adopt e-government systems.*
H1 (a1): *Level of education influences behavioural intention to adopt e-government systems.*

H1 (b0): *Level of education does not influence use behaviour in an e-government system.*
H1 (b1): *Level of education influences use behaviour in an e-government system.*

As discussed in Chapter 2, having educated citizens with the right skill sets, knowledge aptitudes, and motivation make an impact on e-government adoption and utilisation (Naidoo, 2012). The quantitative results indicate that a person's level of education has a significant influence on his/her behavioural intention to adopt and use behaviour of e-government systems. The null the hypotheses (H1 (a0)) and (H1 (b0)) were hence rejected. Therefore, the alternative hypotheses (H1 (a1)) and (H1 (b1)) were accepted with (β = 0.64; p-value < 0.05) for (H1 (a1)) and (β = 0.74; p-value < 0.05) for (H1 (b1)). The relationship between the level of education and behavioural intention accounted for 87 percent of its variance, while that between use behaviour and level of education accounted for 74 percent. Therefore, the quantitative findings of this study concur with several authors such as (Yusuf & Xiaoyun, 2016; Rabaa'i et al., 2016; Zafiropoulos et al., 2012; Alshehri et al., 2012; Al-Shafi, 2009; Lee et al., 2011) who established a significant positive relationship between training of potential e-government systems users and systems acceptance and utilisation. Therefore, education and skills play a significant role in the acceptance and utilisation of e-government systems by the broader society and may contribute towards eradicating the utilisation divide and inequalities that are high in the SADC region.

Similarly, the qualitative empirical findings agree with the quantitative results. The majority of the participants confessed that their level of education opens them some avenues for developing essential skills and the level of awareness required for accepting and adopting e-government systems. The literature (United Nations, 2016; Alateyah et al. 2014) has also underscored the importance of education and training on e-government adoption by citizens.

The implication of the findings is that governments should invest more in improving citizens' level of education since this has a positive effect on their capacity to use e-government systems. This is especially relevant to those citizens who did not have the opportunity to acquire the necessary knowledge on how to use computer enabled devices, the internet, and e-government systems in their lives.

8.3.2 Effect of Experience of Use on e-Government utilisation

H1 (c0): *Experience of using the internet does not influence use behaviour of e-government systems.*
H1 (c1): *Experience of using the internet influences use behaviour of e-government systems.*

In the literature, citizens' experience of using the internet was considered a crucial factor affecting the utilisation of e-government systems (Bélanger & Carter, 2008; Venkatesh, Sykes, & Venkatraman, 2013; Venkatesh, Thong & Xu, 2012). The empirical quantitative findings in Chapter 6 recognised prior experience in using the internet as positively influencing someone's use behaviour of e-government systems in the context of the SADC region. The analysis revealed that the coefficient path between EXP and USE were positively significant ($\beta = 0.69$; p-value < 0.05). Therefore, the alternative hypothesis (H1 (c1)) was accepted. These findings could be explained by the fact that whilst citizens with previous experience in using the internet may find e-government systems a totally different experience; the use of e-government systems may still demand pertinent experience in such a system.

Similarly, the qualitative results of this study established that the majority of interviewees attributed their use of e-government systems to their previous experience in using computers and the internet. The qualitative results of this study confirm the quantitative results. The majority of interviewees have attributed their utilisation of e-government systems to many factors, chief amongst them including prior internet user experience and social influence from colleagues. Furthermore, more sophisticated e-government systems were found to be difficult to use, even by those citizens with several years of internet-use experience.
Also, the majority of interviewees who were not using e-government systems have attributed their 'non-use' to lack of relevant skills and experience. Moreover, this study produced results that corroborate findings of the United Nations e-Government Survey (2016) and Naidoo

(2012) who underscored that having educated citizens with the right ICT skill sets, knowledge of using the internet, aptitudes, and motivation makes an impact on e-government utilisation.

The implications of our findings are that governments should invest more in the human capital development of their citizens, starting at the grassroots levels (primary education) in order to improve their ICT literacy rate, create a knowledge society through awareness, and involve citizens on e-government matters in order to promote utilisation of such e-systems. Moreover, the corpus of literature in Chapter 2 have demonstrated that with average scores of 3.71 for Zambia and 4.65 for Zimbabwe (all below the average score for developing nations (6.06) and the World (6.81)) on the ICT skills sub-index; both countries should work hard to improve the general level of ICT competencies amongst their citizens. Additionally, in the G2C context, governments should strive to design simple and user-friendly e-government systems that may demand basic knowledge of ICTs and skills from citizens (United Nations, 2014; Khan et al., 2010; UNESCO, 2015).

8.3.3 Effect of Vernacular Language Option on e-Government Adoption

H1 (d0): *Availability of vernacular language option does not influence behavioural intention to adoption e-government systems.*
H1 (d1): *Availability of vernacular language option influences behavioural intention to adoption e-government systems.*

The analysis of the languages spoken in Zimbabwe and Zambia in Chapter 4 and Chapter 5 showed that Shona, Ndebele, Nyanja, and Bemba are the dominant languages spoken, whilst English is the second language in both countries. In urban areas and amongst the educated people in the SADC region, English is predominantly used as the medium of communication at workplaces, schools, and institutions of higher learning. However, previous studies (United Nations, 2014, 2016; World Bank, 2016d; Ndlovu & Ndlovu, 2013) revealed that large percentage of the SADC population lives in the rural areas and informal settlements where English is not a dominant language (Ranchod et al. 2016). The quantitative results of this study confirm a positive relationship between the availability of vernacular language options on e-government systems and citizens' behavioural intention to adopt such systems. Therefore, the alternative hypothesis (H1 (d1)) stands ($\beta = 0.71$; p-value < 0.05). However, vernacular

language options were found to have no moderating effect on use behaviour of e-government systems. Several interviewees concurred that vernacular language options are one of the fundamental aspects that allure some people to adopt e-government systems.

This suggests that people who were already frequent users of the Internet and e-government systems were not affected by the absence of vernacular language options on e-government systems. Moreover, the literature review underscored the inclusion of several language options on e-government systems as a good website accessibility feature that impacts positively the perceived ease of use of the system, especially by the first time and naïve users. These results mirror previous research by (Otieno et al., 2016; Perucca & Sonntagbauer, 2014; Rorissa & Demissie, 2010; Alampay & Umali, 2007) which likewise confirmed that the availability of language options on e-government systems significantly affect one's behavioural intention to use such systems.

The significance of this factor is that decision makers and system designers, practitioners, analysts and implementers of e-government systems should seriously consider as pertinent and incorporate website personalisation features (i.e. option for selecting one's preferred language). Such features enhance the accessibility and stimulate utilisation of e-government systems by many people speaking different languages.

8.3.4 Awareness of e-Government

H2 (a0): *Awareness of e-government does not influence behavioural intention to adopt e-government systems.*

H2 (a1): *Awareness of e-government influences behavioural intention to adopt e-government systems.*

H2 (b0): *Awareness of e-government does not influence use behaviour of e-government systems.*

H2 (b1): *Awareness of e-government influences use behaviour of e-government systems.*

The quantitative results of this study found a strong and significant correlation between citizens' awareness of e-government systems and their behavioural intention to adopt (acceptance) ($\beta = 0.44$; p-value < 0.05) and their actual utilisation ($\beta = 0.81$; p-value < 0.05) of such e-systems. In-line with the hypothesised model on awareness, the findings of this study uphold the suggested alternative hypotheses (H2 (a1)) and (H2 (b1)). Therefore, the null hypotheses (H2 (a0)) and (H2 (b0)) were thus rejected. Whilst the corpus of literature analysed in Chapter 2 has drawn attention to the influence of awareness of e-government on participation by citizens on online services in general. The empirical quantitative findings in Chapter 6 have demonstrated the lack of effective and targeted e-government awareness campaigns by the government aimed at sensitising the general public about the existence and benefits of adopting and utilising such e-services. Instead, the quantitative results of this study have demonstrated that citizens were influenced more by their family members and colleagues whom they trusted and admired to use e-government systems. Several prior studies (Turkavci, 2016; Dombrowski et al., 2014; Bwalya, 2011; Al-Jaghoub et al., 2010) have eluded the low levels of e-government adoption and utilisation to lack of awareness of such e-systems amongst citizens in most developing and emerging economies. However, other scholars like Alsaif (2013) could not establish any significant association between awareness and adoption; arguing that adoption is a complex phenomenon influenced by both psychological and technical factors.

Moreover, the qualitative findings of this study complement the quantitative results by concurring that low government conscientisation effort to citizens regarding the availability and benefits of using e-government systems remains poor in Zimbabwe and Zambia. For instance, a considerable number of interviewees in this study suggested that they were unfamiliar with the concept of e-government and worst still, the sort of services available through such systems. Additionally, the qualitative findings of this study revealed that little advertisements appearing on the national television, radio and newspapers were not an effective mechanism for creating widespread e-government awareness.

However, the fact that the with limited access to such media rendered governments' awareness campaign efforts less effective in influencing citizens' behavioural intention to adopt and use e-government systems (). Moreover, the qualitative findings in this study are consistent with a study by Weerakkody et al. (2007) which established that the majority of Zambians were unaware of e-government initiatives.

In light of these findings, the majority of citizens could not establish any justification and benefits of adopting and using e-government systems and would still prefer receiving 'face-to-face over the counter' public services the majority of people in these two countries lived in rural areas (African Union, 2017; United Nations Economic Commission for Africa, 2016). This was attributed to the lack of targeted awareness campaign efforts by government agencies in Zimbabwe and Zambia. The findings imply that, as the level of awareness of e-government systems increases, so do the motivation, acceptance and the actual utilisation of such systems by the majority of citizens. In this regard, policy-makers on e-government matters should engage citizens through various communication mediums to tap their concerns, demands and preferred e-services. Moreover, such citizen-centric and people-driven approaches are essential for e-inclusion and were anticipated to encourage the acceptance and adoption of e-government systems due to their local context relevancy.

8.3.5 Effort Expectancy Impact

H3 (a0): *Effort Expectancy does not influence use behaviour of e-government systems.*
H3 (a1): *Effort Expectancy influences use behaviour of e-government systems.*

Effort expectancy is the degree of ease associated with the use of an e-government system (Venkatesh et al., 2003) and in this study, it was measured by citizens' perceptions and experience regarding how clear, simple and easier it was to interact with the e-system and get the job done without any hustles. The null hypothesis (H3 (a0)) and (H3 (a1)) were used to assess the influence of effort expectancy on citizens' use behaviour of e-government systems. A positive and significant path coefficient between effort expectancy and use behaviour of e-government systems ($\beta = 0.62$ with p-value < 0.05) was confirmed by the quantitative results of this study. These findings imply that the more people consider e-government systems to be accessible, easy to use and user-friendly, the higher the chances of accomplishing the tasks much faster and this is believed to impact one's decisions to continuously utilise such services.

In addition, the qualitative results of this study concur with the quantitative findings by showing that effort expectancy is a major factor that influences citizens' usage of e-government systems. The majority of the interviewees confirmed their preferences for using easier e-government systems that consume less time and effort to complete a task or transaction. The qualitative

results also showed widespread preference by interviewees for inco-operation of web accessibility features like language options, blogs, frequently asked questions (FAQs), and easy to use e-government systems as a solution for easing one's effort towards e-system utilisation. Consequently, findings of this study mirror several previous studies by (Samuel, 2014; Otieno et al., 2013; Venkatesh, Sykes & Venkatraman, 2013; Boone, 2012; Alshehri, 2012) which reaffirmed the significant effect of effort expectancy on the actual utilisation of e-government systems in developing countries. Moreover, the Web Measure Index for both Zimbabwe and Zambia in Chapter 2 (see Table 2-7 and Table 2-10) found that the majority of the investigated ministerial websites did not have the help, advanced web-search and FAQ features to facilitate ease of use by citizens. However, the findings of this study contradict findings of Alsaif (2013) who found no correlation between effort expectancy and use behaviour of e-government systems.

The implications of the findings are that policymaker and designers of e-government systems should strive to entice citizens to use such e-services by incorporating website internationalisation and accessibility features. Typically, they could incorporate simple and straightforward words and statements, incorporating local language options as well as accessibility tools like Frequently Asked Questions (FAQs), help and searching facilities on e-government systems to promote ease of access and use by the broader society.

8.3.6 Performance Expectancy Impact

H4: *Performance Expectancy positively influences citizen's use behaviour of e-government systems.*

In the context of this study performance expectancy refers to the extent to which one believes that the use of e-government systems, as opposed to visiting government offices for accessing government services leads to attaining some benefits in the form of monetary and time savings, better services. Moreover, the corpus of literature in Chapters 2 and Chapter 3 has shown that such anticipation of benefits of using e-government systems is a predictor of one's use behaviour of such e-systems. The quantitative results found performance expectancy to have no influence on one's use behaviour of e-government systems. Therefore, hypothesis (H4) was not supported (β = -0.11; *p*-value (0.126) was greater than 0.05) by the findings of this study.

Moreover, the analysis of the qualitative data Chapter 7 of this thesis concurred; the majority of the interviewees revealed that there is a widespread lack of knowledge about the benefits to be attained from using e-government systems. To start with, there was a shared perception amongst citizens not using e-government systems that with their prevalent lack of awareness of such e-systems, it was illogical to attach any benefits to such systems. However, the majority of interviewees who were using e-services like e-filing of tax returns, e-Banking and Eco-Cash reported that there were intermediaries at community level to assist them to use such systems, and as such performance expectancy was an insignificant factor since they still had to travel to the local community centres like growth points to access such e-services.

These findings are consistent with Al-Sobhi et al. (2011) who established no correlation between performance expectancy and citizens' use behaviour of e-government systems in Saudi Arabia. Moreover, the findings of this study are in line with Al-Shafi (2009) who found no significant influence of performance expectancy on the use behaviour of e-government systems by citizens in Qatar. However, results of this study were unexpected and inconsistent with findings of previous studies (Bwalya & Mutula, 2014; Alsaif, 2013; Boone, 2012; Venkatesh et al., 2012) which established performance expectancy as a strong predictor of use behaviour of e-government systems. However, different contexts of investigation could possibly be attributed to such disparities in findings of this study and that of prior studies.

The implications of these findings are that the citizens' performance expectancy of e-government systems should be increased through aggressive conscientisation efforts regarding the usefulness and benefits of adopting and using such e-systems using targeted and multi-channel outreach programs. Analogously, if the benefits of adopting and utilising e-government systems are demonstrated interactively to the general public, the chances of acceptance and use of such systems would probably increase in developing countries.

8.3.7 Impact of Social influence and habits on e-Government

H5 (a): *Social influence and habits positively influence citizen's behavioural intention to adopt e-government systems.*

H5 (b0): *Social influence and habits do not influence use behaviour of the e-government system.*

H5 (b1): *Social influence and habits influences use behaviour of e-government systems.*

In the corpus of literature discussed in Chapter 3, several studies (ALotaibi, 2016; Albesher, 2015; Alshehri, 2012; Alkhatib, 2013; Venkatesh et al., 2012; Al-Shafi & Weerakkody, 2010; Venkatesh et al., 2003) have underscored the significant role played by the social influence construct in persuading citizens to use e-government systems. The statistical results of this study in Chapter 6 concur with the aforementioned literature, by establishing a significant positive relationship between social influence and habits, and use behaviour of e-government systems for the SADC case. Therefore, the alternative hypothesis (H5 (b1)) was supported (β = 0.63 with p-value < 0.05). However, a positive path coefficient between social influence and habits, and behavioural intention to use e-government systems was not significant, (β = 0.27; p-value (0.235) > 0.05). As a result, the null hypothesis (H5 (b0)) and hypothesis H5 (a) were rejected.

Analogous to the quantitative findings, the empirical qualitative results in Chapter 7 of this thesis established social influence as a crucial factor influencing citizens' use behaviour of e-government systems. Other trusted and closely-related people's positive recommendations and opinions, compounded with one's habits related to the use of ICT devices and internet were established to have an influence on citizens' use behaviour. However, the majority of the interviewees have voiced their concerns regarding the inadequacy of governments' efforts to reach out to many citizens and convince them to adopt and use e-government systems. Moreover, the aforementioned theoretical arguments could be further explained by Venkatesh et al. (2012) who suggest that in most circumstances where the adoption and utilisation of an e-system are voluntary; just like in most e-government systems, social influence plays a significant role in the early stages of acceptance and use. Similarly, the outcome of this study could be explained by the fact that the use of most e-government systems in the SADC region has never been compulsory. As a result, those citizens with the interest, with the right influence and with the right aptitudes are most likely to use e-government systems.

The implications of the findings are that government agencies should encourage citizens to influence their colleagues, relatives and workmates who are still unwilling to accept and use e-

government systems. Furthermore, governments should devise some targeted advertisements and outreach awareness campaigns aimed at reaching out to and encouraging citizens to adopt and use e-government systems in addition to social influence and networking.

8.3.8 Effect of Behavioural intention on e-Government use

H6 (a0): *Citizens' behavioural intention to adopt e-government systems does not influence use behaviour of such systems.*
H6 (a1): *Citizens' behavioural intention to adopt e-government systems influences use behaviour of such systems.*

Behavioural intention to adopt is one of the most crucial factors in the TAM and UTAUT models which predict the actual use behaviour of e-government systems by a person (Venkatesh et al., 2003). In addition, Alkhatib (2013) and Venkatesh et al., (2012) posit that 'intention to use' resembles one's attitude towards use, whereas utilisation is behaviour and as such intention to adopt is a strong predictor of actual e-system utilisation. Therefore, predictions of future use and personal plans for adoption were used to measure citizens' behavioural intention to adopt e-government systems.

A significant positive path coefficient between behavioural intention and use behaviour was confirmed by the quantitative results of this study ($\beta = 0.74$, p-value < 0.05). Thus, supporting the alternative hypothesis (H6 (a1)). Findings of this study are consistent with the UTAUT2 theoretical argument and previous studies in the field of information systems and e-government (Poushter & Stewart, 2016; Albesher 2015; Alkhatib, 2013; Alsaif, 2013; Venkatesh et al., 2003) which confirmed behavioural intention as a strong predictor of use behaviour.
However, findings of this study disagree with (Al Khattab et al., 2015; Alshehri, 2013) who found no correlation between behavioural intention and use behaviour of e-government in the context of developing nations. These findings suggest governments can positively influence citizens' attitudes and behavioural intention to adopt e-government systems by providing relatively 'easy to use e-systems' that are required by citizens. To achieve this, the corpus of literature in Chapter 2 and 3 have advocated for citizen input, participation, and involvement in e-government matters.

8.3.9 Effect of Price Value on e-Government Adoption

H7 (a0): *Price value associated with internet access does not influence citizens' behavioural intention to adopt e-government systems.*

H7 (a1): *Price value associated with internet access influences citizens' behavioural intention to adopt e-government systems.*

The quantitative results of this study established a significant negative path coefficient between price value and behavioural intention to adopt e-government systems. In-line with the hypothesized (PDEGAUM) model on price value, results of this study support the alternative hypothesis (H7 (a1); (β = -0.49; p-value < 0.05). Whilst the corpus of literature analysed in Chapter 2 and Chapter 3 has drawn attention to the necessity for the availability of allowable ICT devices and internet services to promote e-government adoption by citizens, the quantitative results in Chapters 6 have demonstrated that such ICT devices and services are unallowable to the majority citizens. Several prior studies (Fatouma et al., 2016; World Economic Forum, 2015a; Nyirenda-Jere & Biru, 2015; Venkatesh et al., 2012) as demonstrated in the corpus of literature review of this study have alluded the low levels of e-government adoption (within voluntary context) by citizens to high costing and pricing structures of acquiring ICT devices and accessing e-services in most developing and emerging economies.

Moreover, the qualitative results support the study's quantitative findings and found the cost and pricing of internet access to be a valuable construct influencing citizens' behavioural intention to adopt e-government systems in the SADC region. For instance, the majority of interviewees in this study have acknowledged that the cost of accessing the Internet and price of ICT devices like laptops and smart devices was generally high. However, the qualitative findings of this study are consistent with a study by Nyirenda-Jere and Biru (2015) which established that internet services are generally expensive across Africa and unallowable to the majority of citizens.

A plausible explanation for the negative path coefficient between price value and behavioural intention is that as the price (cost) of accessing the internet increases, people's behavioural intention to adopt e-government systems decreases. The implications of the findings are that policy-makers on e-government matters should collaborate with other government departments and parastatals involved in regulating the pricing structures of internet services to ensure that

they become reasonably allowable to the majority of citizens. Alternatively, governments should implement low-cost e-government services utilising ordinary 'SMS' messaging systems like the Mwana (m-Health) project (United Nations, 2014) adopted in Malawi and Zambia for communicating HIV results to pregnant women. Moreover, as long as the pricing structures of internet services and ICT devices remains unregulated and high in the SADC region, e-government adoption and utilisation remain an option for those who can allow – thus shutting out a considerable number of citizens, yet the objective of e-government is all-inclusive.

8.3.10 Effect of Privacy, Security, and Trust on e-Government Adoption and utilisation

H8 (a0): *Citizens' perceived privacy, security and trust do not influence their behavioural intention to adopt e-government systems.*

H8 (a1): *Citizens' perceived privacy, security and trust influence their behavioural intention to adopt e-government systems.*

H8 (b0): *Privacy, security and trust do not influence citizens' use behaviour of e-government systems.*

H8 (b1): *Privacy, security and trust influences influence citizens' use behaviour of e-government systems.*

The corpus of literature discussed in Chapter 3 have identified citizens' trust on both the internet and e-government systems as one of the most important catalyst affecting their decisions to adopt and use e-government systems in developing countries (Fakhoury & Baker, 2016; Papadomichelaki & Mentzas, 2012; Shalhoub, 2006). The quantitative findings of this study established that citizens' perceived trust in e-government systems and government agencies administering the e-systems have a positive significant effect on their decisions to adopt and utilise such systems. More specifically, the majority of respondents felt that in order to gain citizens' trust, government agencies should secure transactions and safeguard personal information from cyber-attacks. Furthermore, new users of e-government systems expressed their doubts and uncertainty when conducting financial transactions online due to the widespread sentiments of lack of trust in government agencies.

The qualitative results of this study support the quantitative findings and found trust to be a fundamental construct affecting citizens' decisions to utilise e-government systems. Specifically, the majority of interviewees expressed their concerns and fear of uncertainty regarding what government will end up using their personal and confidential information for. Typically, some interviewees have advocated for governments to use strong encryption, biometric, smart cards, public key cryptography and authentication mechanisms on e-government systems. The null hypotheses (H8 (a0)) and (H8(b0)) were therefore rejected. Hence, the alternative hypotheses (H8 (a1)) and (H8 (b1)) were significant, positive and accepted – (β = 0.45; p-value < 0.05) and (β = 0.79; p-value < 0.05) respectively.

Results of this study are consistent with findings of previous studies on e-government adoption done in the Arab World (Alzahrani et al. 2016; Al Khattab et al. 2015; Cai Shuqin et al. 2016) and in Africa (Chibango, 2014; Munyoka & Manzira, 2014; Bwalya & Healy, 2010) which found that one's level of trust on the e-government system significantly influence their perception and decisions to use such systems. However, our findings disagree with findings of the study done by Gonçalves et al. (2016) in Brazil on the e-Social system which established that privacy, security and trust factors plays an insignificant role in influencing citizens' behavioural intention and decisions to adopt and use e-government systems that are compulsory to all citizens. This study took a different approach to e-government adoption and utilisation in which the government should devise mechanisms that persuade citizens to use the systems rather than coerce them to use. Therefore, this study suggests that in order to stimulate the use of e-government system by citizens, governments in SADC should put mechanisms in place through good governance that promotes and encourage citizens to build trust on e-government systems. Moreover, our findings concur with suggestions by Cai Shuqin et al., (2016) that governments should ensure that e-government systems and transactions are always secure, trustworthy and reliable to encourage e-service utilisation.

8.3.11 Effect of Facilitating Conditions on intention to adopt e-Government

H9 (a0): *Facilitating conditions does not influence citizens' behavioural intention to adopt e-government systems.*

H9 (a1): *Facilitating conditions influences citizens' behavioural intention to adopt e-government systems.*

H9 (b): *Facilitating conditions positively influence citizens' use behaviour of e-government systems.*

In the literature results of the International Telecommunication Union (2014c) the availability (or the unavailability) of ICT infrastructure like fixed broadband, wireless broadband, mobile devices with access to wireless internet (WI-FI), mobile cell phone service providers and fixed telephone lines exhibited the strongest effect on citizens' behavioural intention to adopt e-government systems in the G2C domain. Similarly, Venkatesh et al., (2012) established that in the G2C (consumer context), citizens who have lower levels of facilitating conditions (less access to better training, support, ICT resources, time and money) are likely to have lower intentions of adopting e-government systems.

The empirical quantitative findings of this study have established facilitating conditions as having a significant positive influence ($\beta = 0.71$; p-value < 0.05) on citizens' behavioural intention to adopt e-government systems in the SADC region. Thus, the alternative hypothesis (H9 (a1)) stands.

However, in the context of citizens who were already using e-government systems, the construct of facilitating conditions had no influence on use behaviour. Therefore, hypotheses (H9 (b)) and (H9 (a0)) were rejected.

The qualitative results of this study confirm the quantitative results in Chapter 6, by approving that governments in the SADC region are doing very little to assist citizens to adopt e-government systems. The majority of interviewees have attributed their non-adoption of e-government systems to the lack of access to ICT devices like computers, smartphones, and the internet; lack of awareness and relevant competencies to use such systems and due to the high cost of internet data bundles. However, findings of this study contradict results of the studies of Al-Shafi, (2009) and Alsaif, (2013) who established an insignificant relationship between facilitating conditions and behavioural intention to adopt e-government systems in the Arab World. A plausible explanation for the differences in findings could be attributed to cultural, socio-economic conditions and governments' effort dedicated toward facilitating citizens to adopt e-government systems.

The implications for practitioners, decision and policymakers are that facilitating conditions plays a fundamental role in the adoption of e-government systems by citizens. Similarly, findings of this study imply that citizens who have access to a favourable set of facilitating conditions are more likely to adopt e-government systems than those without. Therefore, this study calls for governments in the SADC region to come up with mechanisms of addressing all the elements of facilitating conditions relating to technical support in order to address high digital divide; and government support targeted at overcoming the utilisation divide of e-government systems.

8.3.12 Effect of Quality of Services and Information on e-Government systems use

H10 (a0): *Quality of services and information does not influence citizens' use behaviour of e-government systems.*

H10 (a1): *Quality of services and information influences citizens' use behaviour of e-government systems.*

Quality of services and information refer to the combined quality features associated with e-government websites, services offered and the accuracy, completeness, timeliness, conciseness, and relevancy of the information provided. In the literature, these aspects have always been treated separately; but with considerable impact on citizens' use behaviour of e-services (Chatfield & AlAnazi, 2013; Papadomichelaki & Mentzas, 2012; Twinomurinzi et al., 2012). This study argues that quality of services and information are interrelated and thus treated as a single endogenous construct. Analysis of the quantitative results has established a significant positive path coefficient (β = 0.42; p-value < 0.05) between perceived quality of services and information with the use behaviour of e-government systems by citizens. Thus, the alternative hypothesis (H10 (a1)) was could not be rejected.

In addition, the qualitative empirical findings confirm the quantitative results of this study in which the majority of the interviewees have acknowledged that they were motivated and attracted to using e-government systems that were easy to navigate and that provided up to date information. However, some few interviewees have raised their concerns regarding some e-

government systems that were perceived to be less user-friendly, were complex to use and find information, and often offering obsolete information. Moreover, these findings reaffirm results of prior research (Sá et al., 2016; Fan & Yang, 2015; Detlor et al., 2013) that accentuates the inco-operation of web accessibility features as paramount for stimulating the use of e-government systems.

The implication for practitioners, policy makers and implementers is that the quality of services and information plays a pivotal role in the use and success of e-government systems. Moreover, the findings suggest that when e-government systems provide updated information and are easier for one to manoeuvre and find the required information; this is bound to result in greater citizen participation in e-government matters.

8.4 Discussion of the Research Questions in-line with the Overall Findings

This study has achieved its objectives by investigating factors affecting the adoption and utilisation of e-government systems by citizens in the context of the SADC region and through the proposal of the PDEGAUM model. The major objectives of this study were:

1. To undertake a comprehensive literature review aimed at gaining an in-depth understanding of e-government initiatives that have been undertaken. (Chapter 2).
2. To identify and evaluate relevant models and frameworks available for assessing e-government adoption and utilisation and their suitability to developing nations. (Chapter 3).
3. To formulate a people-driven e-government adoption and utilisation conceptual model that captures all the salient factors affecting citizens' decisions to adopt and use e-government systems. (Chapter 3).
4. To empirically examine the fundamental factors and challenges affecting e-government systems adoption and utilisation by citizens and propose potential solutions. (Chapters 5, 6 and 7).
5. To revise the proposed conceptual model based on empirical findings and formulate some recommendations focused on addressing the identified research gaps existing between the research fraternity and the actual e-government adoption and utilisation levels by citizens in the SADC region. (Chapter 8).

6. To delineate the theoretical, contextual, empirical and substantive (practical) implications of the results in order to progress the adoption and utilisation of e-Government systems in the SADC region. (Chapter 9).

To realise the aim and to meet the objectives of this study, a comprehensive literature review was undertaken. The reviewed corpus of literature in Chapters 2 and 3 formed the foundation for establishing the research gap for advancing new knowledge in the field of e-government adoption and utilisation in the SADC region and other developing nations. Factors affecting citizens' behavioural intention to adopt and utilise e-government systems were adopted from several research disciplines (i.e. information systems, electronic commerce, electronic banking, marketing, electronic governance and mobile governance). After identify the research gap; major factors perceived to affect e-government adoption and utilisation were integrated into Venkatesh's et al., (2012) UTAUT2 model and the ITU's (2009) e-Government Implementation Toolkit to come up with the PDEGAUM model that was proposed in Chapter 3 and empirically tested in Chapters 5, 6 and 7. The literature review for this study was carried out in-line with the research problem outlined in Chapter 1. The research problem was further subdivided into four questions and answered as follows:

8.4.1 Answering Research Question One (RQ1)

RQ1: *What e-government initiatives are in place to enhance access to government services by citizens in Zambia and Zimbabwe?*

Research Question One (RQ1) of this study was answered mainly in Chapter 2. In the context of this study e-government initiatives refers to both policies and systems in place. The corpus of literature reviewed in Chapter 2 has identified the enactment and adoption of several National ICT Policies and statutory acts as the biggest milestones in attaining citizen e-inclusion on e-government agenda for both Zambia and Zimbabwe. The Zimbabwe ICT Policy Framework (2014) was established for standardizing, offering legal framework and regulating the interoperability of all national e-services (e-Commerce, e-Health, e-Agriculture, e-Mining, e-Tourism, e-Government, e-Environment, e-Manufacturing, e-Transport and social networks)

to achieve sustainable, secure and trusted electronic data interchange and open government data exchange. This study also found that the Zimbabwe ICT Policy Framework (2014) and its predecessors paved way for the growth of several e-government systems like online company registration system, e-passport application system and e-commerce systems like the Ecocash which is widely used in Zimbabwe for e-payment in times of hard-cash shortage. However, this study established that the ICT and e-government project implementation is lagging far behind the targets outlined in the ICT policies.

The study also found that the Zambian ICT Policy framework of 2006 and the ICT Act of 2009 provided the basis for advancing and governing ICTs and e-government projects in Zambia. This study established that the Mwana m-health project for providing infant HIV test results; the Zambia National Farmers Union m-Government system for linking farmers and possible markets; e-Police Public Complaints Authority Information Management System; e-School Information Management System and e-Tax filling are the brainchild of the Zambian ICT policies and Acts. However, this study established that ICT policies in Zambia are out-dated to address current issues relating to citizens' ICT and e-government needs.

Moreover, the study established that ICT policy enactment and e-government initiatives in Zimbabwe are initiated at the government levels culminating in system implementation. Thus, adopting the top-down approach without consultation of the broader citizenry. While the corpus of literature has acknowledged some successes of the top-down approach to rolling out e-government systems in countries like Brazil where adoption of such systems is compulsory; the same approach is failing to realise the similar success in Zimbabwe, Zambia and most SADC countries where e-government adoption is voluntary.

8.4.2 Answering Research Question Two (RQ2)

RQ2: *What are the main factors affecting the adoption and utilisation of e-government systems by citizens in Zambia and Zimbabwe?*

In the context of this study, e-government adoption was defined as citizens' willingness to accept e-government systems; whilst e-government utilisation refers to the continuous usage

of government services via online. Moreover, it was established in Chapter 6 that citizens' Behavioural Intention (BI) (dependent variable) to use was associated with e-government adoption; whilst frequency of use of e-government systems was associated with e-government use behaviour (USE). The PDEGAUM conceptual model proposed by this study hold that the BI to adopt dependent variable had a direct effect on USE. However, as noticed in Figure 6-6, each of the dependent variable (BI and USE) had its own pertinent direct determinant and moderator variables.

The Research Question Two (RQ2) for this study was answered mainly in Chapter 2, 3, 6, 7 and 8. In-line with e-government adoption, both the quantitative and qualitative results alluded that behavioural intention to adopt e-government systems was adversely affected by lack of awareness of the existence of and benefits of using such systems; lack of facilitating conditions to assist citizens to use such systems; perceived lack of privacy, security and trust on e-government systems; lack of relevant skills required for one to competently use e-government systems and the high costs of accessing the internet and e-government in both countries.

Concerning factors affecting citizens' utilisation of e-government systems, this study found that effort expectancy; e-government awareness; social influence and habits; privacy, security and trust; behavioural intention; and service quality and information had a significant impact. Furthermore, a person's age, the level of education and experience in using the internet positively moderated the use behaviour dependent variable. Besides these factors, citizens who were using e-government systems suggested that government should involve citizens on e-government matters, provide simple and easy-to-use e-government systems; and to incorporate locally-relevant content using local language options to increase accessibility and achieve universal e-inclusion.

8.4.3 Answering Research Question Three (RQ3)

RQ3: *How can assessment of the adoption and utilisation of e-government initiatives be made?*

Based on the corpus of literature reviewed in Chapter 3, relevant existing models and frameworks for predicting the adoption and utilisation of e-government systems by citizens were identified and critically analysed by the researcher to identify the research gap. Moreover, Figure 3-6 in Chapter 3 analysed the evolution of models used for evaluating ICT adoption and acceptance, leading to the establishment of the research hypotheses for this study. Based on the identified research gap in existing models, the initial People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model for this study was proposed in Figure 3-9 to comprehensively answer Research Question Three (RQ3). In addition, Chapters 5, 6, and 7 provided rigorous analyses and validation of the factors perceived to affect the adoption and utilisation of e-government systems by citizens – thus confirming the significant factors that were ideal for such an evaluation. The point-of-departure is that the PDEGAUM conceptual model harnessed the supply-driven and demand-driven factors envisaged to influence citizens' behavioural intentions and decisions to adopt and utilise e-government systems.

8.4.4 Answering Research Question Four (RQ4)

RQ4: *How can the identified key factors be used to construct a holistic people-driven conceptual model for stimulating and guiding the adoption and utilisation of e-government systems by citizens in Zambia and Zimbabwe?*

To answer Research Question Four (RQ4), empirical data for this survey relating to the construct variables and moderating factors of the proposed PDEGAUM conceptual model were empirically tested in Chapters 5, 6 and 7 using data collected from respondents and interviewees in Zambia and Zimbabwe.

As described in Section 4.4 of this thesis, explanatory sequential mixed methods design was used to collect the empirical data; starting with the quantitative data and followed by interviews. Findings of this study established that only four independent variables (E-Government Awareness; Facilitating Conditions; Price Value; and Privacy, Security, and Trust) and two moderating variables of 'Level of Education' and Vernacular Language significantly explained citizens' behavioural intention to adopt e-government systems.

Similarly, the quantitative data found that six pertinent independent variables of (Effort Expectancy; E-Government Awareness; Behavioural Intention; Social Influence and Habits; Service Quality and Information; and Privacy, Security, and Trust) and two moderating factors of (level of education and experience of use) significantly influenced the use behaviour of e-government dependent variable. The empirical qualitative findings in Chapter 7 confirmed that these independent variables indeed explain the factors conceptualised in Figure 3-9 in Chapter 3 as influencing citizens' behavioural intention to adopt and the actual utilisation of e-government systems in the SADC region. Therefore, only significant factors were considered in the revised conceptual model (see Figure 8-1).

Furthermore, the validated people-driven e-government adoption and utilisation (PDEGAUM) conceptual model (Figure 8-1) introduce a paradigm shift from the top-down approach to e-government system roll out. In the top-down approach practitioners (policy and decision makers and implementers) on e-government, design policies at the highest level and implement the systems without or with minimum citizen participation and then anticipate citizens to adopt and use such systems. The PDEGAUM acknowledges that both citizens and government should play an equal role in the input of ideas regarding the systems to be implemented; before the actual implementation is done. Such an approach is believed to minimise some animosity and resistance to accept and use such systems amongst citizens.

8.5 Revision of the PDEGAUM Research Model

Based on the significant and valid factors affecting citizens' behavioural intention to adopt and actual utilisation of e-government systems in Zambia and Zimbabwe in Chapters 5, 6 and 7, the PDEGAUM conceptual model proposed in Figure 3-9 in Chapter 3 was revised. Furthermore, the revised PDEGAUM conceptual model was aimed at drawing attention to key factors requiring attention in order to promote e-government adoption and utilisation by citizens. As illustrated in Figure 8-1, governments should value citizens' demands and inputs (in the form of catalyst factors) when implementing e-government systems as these are drivers for adoption and utilisation.

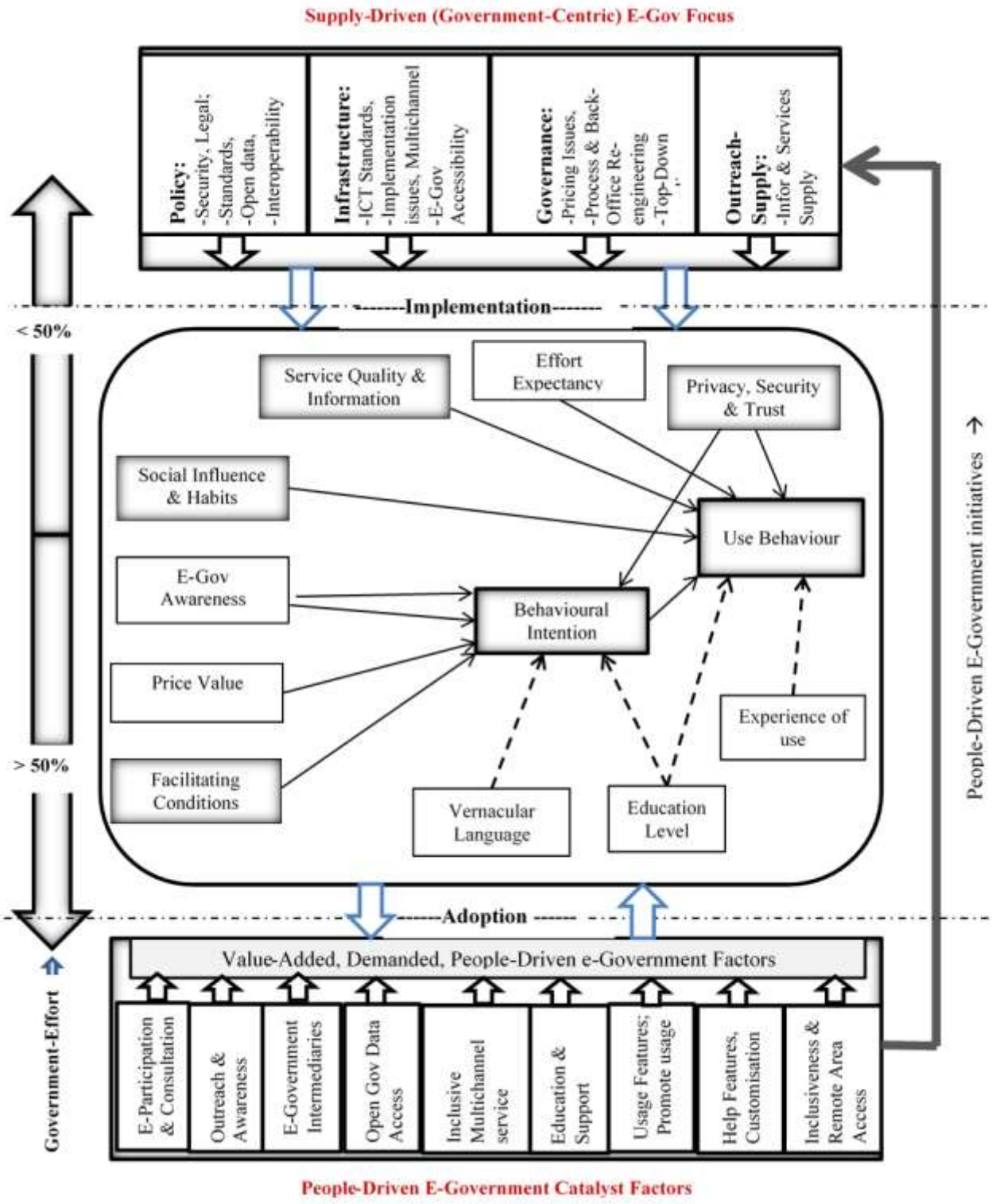


Figure 8- 1: Revised People-Driven E-Government Adoption and Utilisation Model

8.6 Chapter Summary

The purpose of this chapter was to discuss the results of this research study, to fulfil research objective five and to answer research question four. Moreover, the aim of this study was to identify and empirically test factors that affect citizens' desire to adopt and to actually use e-government systems in the SADC region with the goal of proposing a people-driven e-government adoption and utilisation (PDEGAUM) conceptual model. This model is envisaged to provide a tool that could assist decision and policymakers on e-government matters on how to roll out e-systems that are demanded by citizens. Similarly, this tool could be used in other developing countries confronted with similar socioeconomic circumstances on e-government matters. From a practical perspective, the revised PDEGAUM conceptual model has managed to successfully harness factors associated with the supply-driven (government initiated projects without citizen participation), demand-driven (citizen-to-government collaborated e-systems) and behavioural aspects into a comprehensive e-government adoption and utilisation model.

In-line with this discussion chapter, the ensuing remarks were made:

- Fourteen out of the seventeen tested hypotheses were supported by this study – therefore, the findings are consistent with the suggested PDEGAUM conceptual model. Performance expectancy is the only factor that was found to be insignificant in explaining citizens' behavioural intention to adopt e-government systems.
- The construct of E-Government Awareness (EA) predicted use behaviour the most (β = 0.81; p-value < 0.05); followed by Privacy, Security and Trust (PST) (β = 0.79; p-value < 0.05), then Behavioural Intention (β = 0.74; p-value < 0.05) and Education Level (EDU) (β = 0.74; p-value < 0.05).
- Experience of Use (EXP) (β = 0.69; p-value < 0.05); Social Influence and Habits (SIH) (β = 0.63; p-value < 0.05); Effort Expectancy (EE) (β = 0.62; p-value < 0.05), and Service Quality and Information (SQI) (β = 0.42; p-value < 0.05) also exerted significant influence on use behaviour of e-government systems. Also, the majority of interviewees agreed that if e-government systems were ease and simple to use with minimal assistance and providing valuable information to their needs; they would contemplate utilising the services.

- Facilitating Conditions (FC) (β = 0.66; p-value > 0.05) and Performance Expectancy (PE) (β = -0.11; p-value > 0.05) had no significant influence on citizens' use behaviour of e-government systems in the SADC context.
- Similarly, six path coefficients exerted significant influence on behavioural intention to adopt e-government systems: Facilitating Conditions (FCn) (β = 0.71; p-value < 0.05), Vernacular Language (VLn) (β = 0.71; p-value < 0.05); Education Level (EDUn) (β = 0.64; p-value < 0.05); Price Value (PVn) (β = -0.49; p-value < 0.05); Privacy, Security and Trust (PSTn) (β = 0.45; p-value < 0.05) and E-Government Awareness (EAn) (β = 0.44; p-value < 0.05). However, Social Influence and Habits (SIHn) (β = 0. 27; p-value > 0.05) had no influence on behavioural intention. Likewise, the qualitative findings confirmed the lack of ICT facilities and assistance given to citizens by the government in order to facilitate e-government adoption. Moreover, the qualitative results revealed widespread sentiments amongst citizens of being unfamiliar with e-government systems – thus, reconfirming the need to create awareness and involve citizens on e-government matters. In addition, the price of accessing the internet and e-government was found to be high and prohibitive. This implies that if citizens received the necessary support from the government, have access to suitable ICTs, were conscious about the availability and existence of e-government systems and allow the costs of accessing the internet; chances were high that their behavioural intention to adopt e-government systems could be positively influenced.
- As anticipated, Privacy, Security, and Trust had a significant influence on behavioural intention to adopt; which indicates the lack of trust by the majority of citizens on the privacy and security features of e-government systems.

As demonstrated by the aforementioned results, the integration of object-based principles (as embodied in the e-Government Implementation Toolkit framework) and behavioural suppositions (as manifested in the UTAUT models) provided an in-depth understanding of factors that were affecting citizens' behavioural intentions to use and the actual use behaviour of e-government systems in the SADC region. Notwithstanding, positive perception of the security offered by e-government systems to privacy, coupled with high level of awareness and suitable ICT competencies were fundamental building blocks needed for stimulating adoption and upholding the utilisation of e-government systems.

Moreover, citizens would be more likely to use e-government systems if they had the necessary facilitating conditions. From a managerial and practical perspective, findings of this study provide decision and policy makers on e-government matters with a novel viewpoint for dealing with e-government adoption and utilisation issues which tend to blur most supply-driven e-government systems in most developing countries.

In the next chapter (9), the researcher provides the conclusion, novel contributions and future research direction of this study.

Chapter 9: Conclusion, Contributions and Future Research

Chapter Overview

This chapter (9) provides a conclusion of this thesis, drawing attention to novel contributions and implications of the findings, limitations of the adopted methodology, and future research direction.

9.1 Research Overview

The corpus of literature reviewed in this thesis (Bwalya, 2017; ALotaibi et al., 2016; United Nations, 2016), established that e-government offers great promise for transforming the public service delivery systems by providing efficient and transparent services to the citizens. Even though the benefits of e-government systems are well-documented, the adoption and utilisation of such systems by citizens remain sparse and challenging. This is especially so, in the context of developing countries where the majority of citizens are confronted with a host of challenges that stifle their desire and prospects of accepting and using such e-systems. Chief amongst the established factors by this study, include the lack of awareness by citizens of the existence of such e-services, which was compounded by governments' lack of involvement of citizens in e-government matters from an early stage. Consequently, citizens would not adopt e-government systems, despite the host of advantages such systems could bring because of the lack of suitable skills to use such systems.

Whilst the corpus of literature in this study have acknowledged numerous research that has been done on e-government adoption and implementation in the SADC region and developing countries in general; a significant absence of empirical research focusing on factors affecting adoption and the actual utilisation levels prevail. For that reason, the aim of this study was to advance a people-driven conceptual model that could be used for investigating and providing pointers to factors that influence and motivate citizens' decisions to adopt and use e-government systems. The same model provides a fundamental tool for use by decision-makers in government to guide their actions on e-government matters.

Through the alignment of demand-driven and supply-driven e-government initiatives, this study was aimed at establishing a greater understanding of pertinent factors that could curtail gaps existing between implementation efforts by government and; adoption and utilisation by citizens. Moreover, given the diversity and complexity of the e-government domain, this research was focused on the G2C subdomain, paying particular attention to the citizen-side of the G2C. Principally, this research was accomplished in nine chapters:

Chapter 1 outlined the research problem, provided background information and the underlying motives for carrying out this empirical study. In addition, the chapter pronounced the aim of this study – 'to develop a People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model that takes into account all the crucial factors affecting the adoption and utilisation of e-government systems in the SADC region.' Such a conceptual model shall guide the actions of e-government policy makers in national development strategies and decision-making process for effective e-government adoption and utilisation in the public sector of developing countries.

Chapter 2 presented a critical review of literature seeking an in-depth understanding of the motivation for adopting e-government in the public sector. The chapter then discussed and classified e-government interaction domains into G2C, G2E, G2G, and G2B. Moreover, the chapter critically analysed different maturity models used for evaluating the levels of e-government development attained by a country. As a result, the UN e-Government Maturity model was established as the most comprehensive and widely used model. The benefits and barriers to e-government adoption and utilisation were scrutinised, leading to the evaluation and discussion of e-government trends around the world (evaluated using the United Nations (2016) E-Government Development Index) along developed versus developing nations, followed by Africa and SADC regions (using a funnelling-approach to literature synthesis). Also, the in-depth analysis of the progress made on e-government initiatives in Zambia and Zimbabwe were analysed using the ITU's (2015) ICT Development Index measurement model along four strands of (ICT readiness, ICT intensity, ICT impact and ICT capacity). National ICT policies and national governance indicators for each country were also scrutinised since they constitute fundamental building blocks that shapes-up the direction and level of e-government development for a nation. Finally, Chapter 2 critiqued the literature using the SWOT analysis and the Research-Gaps Analysis Taxonomy (Hassan, 2011) to identify the theoretical, substantive, contextual and empirical research gaps.

Chapter 3 critically analysed the existing theories and frameworks on e-government adoption and utilisation (the core of this study). With this in mind, the researcher established the research gaps in the literature regarding the non-existence of all-inclusive models for guiding the implementation of people-driven e-government systems and for guiding government efforts and actions on stimulating the adoption and utilisation of such systems by citizens. Therefore, Chapter 3 started by critically analysing existing e-government implementation and adoption models in-line with their contextual relevance to the SADC region and other developing countries. This was then followed by an analysis of the evolution of the UTAUT2 model, leading to the outlining of the seventeen hypotheses for this study. For a better understanding of the factors affecting citizens' adoption and utilisation of e-government systems, the researcher used the UTAUT2 model (Venkatesh et al., 2012) as a base model covering the demand-side of e-government. From the implementation angle (constituting the supply-side) of e-government, the researcher has used the International Telecommunications Union's (2009) e-Government Implementation Toolkit Framework. The researcher has justified the UTAUT2 model as the most suitable model for investigating the adoption of e-government systems, whilst the ITU e-Government Implementation Toolkit Framework was identified and supported as the most relevant theoretical lens for understanding government's efforts and actions towards e-government implementation. The utilisation aspect of the demand-side of e-government constituted the missing link in the existing literature and a research gap for this study.

For the aforementioned factors and justifications, the researcher proposed the People-Driven E-Government Adoption and Utilisation (PDEGAUM) conceptual model for this study (see Figure 3-9). The researcher upholds that the proposed PDEGAUM model provides a novel conceptual model that avails a comprehensive and useful tool for use by decision and policy makers on ways for making smoother e-government implementations and for stimulating the adoption and utilisation of such systems by citizens. For model fit, the proposed PDEGAUM conceptual model was validated using empirical data in Chapters 5, 6 and 7, and then reviewed in Chapter 8 based on the findings.

Chapter 4 established the roadmap for investigating and adopting the most appropriate research approach, research design and research methods for undertaking this research study. The research methodology commenced by discussing and justifying the choice for selecting the

pragmatist research paradigm as providing a comprehensive multi-perspective, dialectical and philosophical stances that permitted paradigm integration (quantitative and qualitative) to adequately address the research problem and achieve the aim of this study. Therefore, case study research design and explanatory sequential mixed methods research approach were found most suitable for this study for gaining a deeper understanding of citizens' lived experiences regarding factors affecting their adoption and utilisation of e-government systems in the SADC region. Quantitative data were collected and analysed first by participants (citizens) in Zimbabwe and Zambia using questionnaires. Following this were interviews, conducted using the same respondents who previously participated in the survey questionnaire and this served as confirmatory to the quantitative findings for testing and validating the PDEGAUM conceptual model proposed in Chapter 3.

Data analysis for this research study was presented in three chapters: Chapter 5, Chapter 6 and Chapter 7. To start with, Chapter 5 presented the descriptive statistics in three phases. The first phase outlined in detail all the pertinent steps taken for dealing with data cleaning and screening procedures, missing data, steps adopted in variable definition and development for SPSS and data entry procedures. Once this was achieved, the researcher had to deal with common methods bias and univariate normality, investing the skewness and kurtosis of the variable constructs for this study. Dealing with outliers for the data set formed the closing step of the preliminary data cleaning phase before the analysis and presentation of the descriptive statistics. The descriptive statistics for this research study were present in two stages, starting with a demographic analysis of e-government users (second phase) followed by demographic analysis of non-users of e-government systems (third phase). A high response rate of 95.6% was achieved for the survey and this was attributed to the self-administering of the questionnaires by the researcher.

Chapter 6 presented advanced statistical analysis and calculations testing the reliability and validity of the study constructs of the PDEGAUM conceptual model proposed in Figure 3-9 in Chapter 3. Cronbach's Alpha was used to measure construct reliability and the results of this study indicated that the study instrument was reliable with scores above 0.70. To establish construct validity, Exploratory Factor Analysis (EFA) was conducted utilising Principal Factor Analysis (PFA) with varimax rotation method. Factor loading of items with values above the recommended 0.4 was attained.

To establish the significance of the loaded construct variables, regression analysis was used. Moreover, regression analysis tested the relationship between the use behaviour and the behavioural intention to adopt dependent variables with several predictor variables associated with each construct. Finally, structural equation modelling (SEM) using IBM SPSS AMOS 24 was used to test the PDEGAUM conceptual model fit, leading to the confirmation of the valid factors (see Figure 6-6) and hypotheses (see Table 6-41).

Chapter 7 (qualitative data analysis) provided a confirmatory of the quantitative results, seeking a deeper understanding of citizens' lived experience regarding factors affecting their adoption and utilisation of e-government systems in Zimbabwe and Zambia. The chapter started by describing the profile of the respondents, followed by an outline and justification for the use of the Total Quality Framework (TQF) as a theoretical lens for executing the qualitative data analysis for this study. Themes for the study were defined leading to a thematic analysis of the qualitative data using Nvivo Plus version 11 QDAS. The qualitative findings indeed confirmed the qualitative results of this research study.

Discussion of the quantitative and qualitative results was presented in Chapter 8 in light of the research questions proposed in Chapter 1 and hypotheses presented in Chapter 3. The chapter commenced by reflecting on the proposed PDEGAUM conceptual model followed by the general discussion of the findings. The discussion of the results confirmed that 14 out of the 17 hypotheses were supported by this study. Following this was a discussion of the research questions in-line with the overall findings leading to the revision of the PDEGAUM conceptual model (see Figure 8-1) proposed in Chapter 3.

Chapter 9 confirmed and reflected on the novel contributions and conclusion of this study. The chapter then outlined how the research aim, objectives and research questions were met and answered in various chapters. Practical implications, research limitations (both methodology and findings), and future research direction wrapped up this research effort.

9.2 Research Findings

The corpus of literature reviewed in Chapters 2 and 3, and the novel contributions (findings) originating from the empirical study can be summed up in this way:

- **Finding 1.** The results of this study contribute new insights into the existing body of knowledge on e-government initiatives undertaken in Zimbabwe, Zambia and the SADC region in general. The findings revealed that e-government implementation and adoption efforts were confronted with a host of challenges (often associated with most supply-driven systems) that were more pertinent to developing countries (Chapter 2). Chief among the challenges were related to inadequacies in ICT infrastructure, delayed ICT policy implementation, governance-related issues, and prevalent low ICT literacy rates, high costs of accessing the internet, and poorly targeted outreach efforts to conscientise the citizens on the availability of and benefits of using e-government systems.

- **Finding 2.** The results drew attention to the unavailability of theoretical frameworks and models (Chapter 3) for guiding and informing e-government implementation, and for promoting the adoption and utilisation of such systems by citizens in order to overcome the identified challenges. Moreover, the critique of existing models for evaluating e-government acceptance, adoption and implementation have illuminated some major differences between developing and developed countries. The study found that these differences provided pointers to factors, pertinent to developing countries that should inform the development of an all-inclusive e-government adoption and utilisation model. Thus, such a conceptual model should provide a comprehensive referral model for governments in the SADC region and other developing countries confronted with similar socio-economic and political set-ups for guiding e-government implementation, adoption and promoting e-service utilisation.

- **Finding 3.** A novel PDEGAUM conceptual model was proposed in Figure 3-9 in Chapter 3 to fill-up the theoretical research gap identified in Figure 2-8 in Chapter 2 and Finding 1 (in this chapter) regarding the non-existence of all-inclusive, people-driven e-government adoption and utilisation frameworks for developing nations. Based on the empirical quantitative and qualitative data collected from respondents from Zimbabwe and Zambia, the PDEGAUM conceptual model was validated (in

Chapter 6) and improved to only incorporate the significant factors. Moreover, the PDEGAUM conceptual model clearly identifies six endogenous factors (facilitating conditions; e-government awareness; price value; and privacy, security, and trust; level of education; and vernacular language option) as having a significant impact on citizens' behavioural intention to adopt e-government systems. Together, 87 percent of the discrepancies among the six endogenous factors were explained by the behavioural intention to adopt e-government systems in the SADC region context.

On the utilisation side, the findings of this study have established eight significant endogenous constructs to the PDEGAUM conceptual model (effort expectancy; e-government awareness; social influence and habits; service quality and information; behavioural intention; privacy, security and trust; level of education and experience in use) that significantly influenced the use behaviour of e-government systems. Combined, the eight endogenous constructs explained 79% of citizens' use behaviour of e-government systems for this study. Consequently, such a mixture of critical (significant) factors is distinctive and entirely suitable for the SADC context.

- **Finding 4.** The structural equation modelling results (Chapter 6, Section 6.5) exhibited that the overall model fit for the PDEGAUM conceptual model was superb in line with the recommended model-fit indices. Moreover, the overall model fit demonstrated that the model-fit indices of the Revised Final Structural models for the users of e-government and non-users of e-government showed better model fit compared to the Retention Models. These findings demonstrate the adequacy and fitness of the proposed PDEGAUM conceptual model.

- **Finding 5.** The quantitative results of this study were validated and confirmed by the qualitative inquiry of the sequential mixed methods approach. Thus, several explanations and insights on the significant factors were gathered from interviewees (Chapter 7), thus, substantiating the overall findings as discussed in Section 9.4 below (Innovative Research Contributions of this study).

9.3 Accomplishing Research Aim, Objectives and Research Questions

The aim and objectives of this research study presented in Chapter 1 were adequately answered in different chapters as outlined in Table 9-1. As the discussion of the findings in Section 8.4 reflects, the research questions for this study were satisfactorily answered in-line with the overall empirical findings.

Table 9- 1: Achieving the Research Aim, Objectives and Research Questions

Research Question/Objective	Answered in which Chapter of this Thesis?
Question 1	Chapter 2, Chapter 8
Question 2	Chapter 2, Chapter 3, Chapter 6, Chapter 7, and Chapter 8
Question 3	Chapter 3, Chapter 5, Chapter 6, and Chapter 7
Question 4	Chapter 3, Chapter 5, Chapter 6, Chapter 7, and Chapter 8
Objective 1	Chapter 2
Objective 2	Chapter 2 and Chapter 3
Objective 3	Chapter 3
Objective 4	Chapter 5, Chapter 6, and Chapter 7
Objective 5	Chapter 8
Objective 6	Chapter 9

9.4 Innovative Research Contributions

The findings of this study presented in Section 9.2 have made some original contributions to knowledge in the area of e-government adoption and utilisation. Although several studies have been undertaken to examine the adoption of e-government systems by citizens in developing countries, the researcher argues that no independent study has investigated the interplay of all the aspects (adoption and actual utilisation) of e-government at once in the context of the SADC region.

A comprehensive understanding of the factors affecting the usage of e-government systems by citizens was unlikely to be fully understood if these three aspects were studied in isolation since they are intertwined (each one has to inform the other). Accordingly, e-government systems cannot attain their full potential without considerable citizen participation, acceptance, adoption and utilisation. Reflecting on the recent efforts by the SADC regional block in addressing the aforementioned challenges, the adoption and utilization of the SADC Digital Framework (SADC, 2009) was a true testimony of efforts undertaken to synchronise e-government initiatives across the region. At the national level, both Zimbabwe (through POTRAZ) and Zambia (through ZICTA) have embarked on awareness campaigns on the best and secure ways of using the internet and most e-services over the national radio stations using vernacular languages. The two governments were also setting up information community centres in order to bridge the digital divide and targeting the disadvantaged groups like women and rural area people. In this regard, the findings of this research have broadened the knowledge on e-government adoption, implementation, and utilisation in the SADC region and thus, making contextual and conceptual novel contributions.

The following subsections discuss the contributions made by this research study in-line with the four research gaps (theoretical, contextual, substantive and empirical) identified in Chapter 2:

- **Contribution 1.** Chapter 2 of this study has identified numerous challenges that were impeding the rollout, adoption, and utilisation of e-government systems in Zimbabwe and Zambia. Consequently, Chapter 3 has attributed the aforementioned hindrances to the absence of suitable e-government adoption and utilisation models for use by decision and policy makers to guide their efforts and actions. Therefore, to fill this theoretical gap inquest, the researcher has proposed a novel, all-inclusive people-driven conceptual model (PDEGAUM) in Chapter 3 for use by policymakers to better understand the factors that are pertinent to the SADC context and affecting e-government adoption and utilisation. The researcher claims that the PDEGAUM model may aid in addressing some of these challenges. Based on the analysis of the empirical data in Chapters 5, 6 and 7; and the critical discussion of the results in Chapter 8, the PDEGAUM conceptual model was revised and presented in Figure 8-1.
- **Contribution 2.** The amalgamation of implementation-oriented and behavioural-oriented theories in studying e-government initiatives have institutionalised a deeper

understanding of the intrinsic and extrinsic drivers of e-government projects in the SADC region. For this reason, the current research study considered the implementation-related theory (ITU e-Government Implementation Toolkit) as informing the government-side and behavioral-oriented model (UTAUT2) (informing the demand–side) to study e-government adoption and utilisation. Therefore, to the best of knowledge of the researcher, this is one of the few studies which have tried to embrace citizens' inputs into informing governments' decisions and policies on e-government systems. Thus, the name, People-Driven e-Government Adoption, and Utilisation (PDEGAUM) model was regarded as the most ideal. The central and novel aspect of the PDEGAUM conceptual model is that the catalyst factors (citizens' inputs) (see Figure 8-1 in Chapter 8) drives and informs the four pillars of e-government implementation on the government-side (policy, infrastructure, governance, and outreach). Thus, satisfying the substantive research gap that has been acknowledged in Section 2.8.2 of Chapter 2. Although the implementation aspect was not empirically tested in this study; it constitutes a major building block that has informed the identified citizen-driven catalyst factors reserved for future studies. Adoption and utilization alone cannot take place in a vacuum, citizens' inputs should go into the final e-government systems implemented based on the identified significant constructs.

- **Contribution 3.** The validated and improved PDEGAUM conceptual model confirmed the six endogenous factors (facilitating conditions; e-government awareness; price value; privacy, security and trust; the level of education vernacular language option) as having a significant influence on citizens' behavioural intention to adopt e-government systems in the SADC region. On the utilisation side, eight endogenous factors pertinent to the PDEGAUM conceptual model (effort expectancy; e-government awareness; social influence and habits; service quality and information; behavioural intention; privacy, security and trust; level of education and experience in use) were confirmed as exerting significant influence on the use behaviour of e-government systems. Consequently, such a mixture of critical (significant) factors was distinctive and entirely suitable for the SADC context.

- **Contribution 4.** Although numerous studies have been undertaken on factors affecting e-government adoption and utilization in developing countries and in sub-Saharan

Africa; little was known about the factors that affect e-government system utilisation by citizens in Zimbabwe, Zambia and the SADC region. Therefore, this research study is unique in that it has chronologically implemented the rigorous explanatory sequential mixed methods research paradigm, integrating the quantitative approach (employing stringent explanatory and confirmatory factor analysis, multiple regression analysis and structural equation modelling) and the qualitative approach (employing the Total Quality Framework to achieve trustworthiness) to validate and confirm pertinent factors influencing citizens' adoption and use behaviour of e-government systems. Thus, this research study has added value in terms of accuracy, reliability, and trustworthiness of the results. Moreover, the study assists us in understanding what aids or hinders the use of e-government and thus making it possible to come up with some mechanisms for improving the actual utilizations levels by citizens. Considering the aforementioned contributions, the researcher concedes that this study has provided an original contribution fulfilling the identified contextual and empirical research gaps in Figure 2-8 in Section 2.8.2 of Chapter 2 of this thesis.

- **Contribution 5.** At the practical implementation level (informed with citizens' inputs), the revised PDEGAUM conceptual model (see Figure 8-1) offers a novel and flexible model that intertwines the supply-driven and demand-driven e-government agenda. The model also offers the option to policy and decision makers in the government of focusing their attention, efforts and actions on a particular aspect (being it adoption, utilisation, implementation or all the three aspects at once); depending on their needs. Similarly, other countries in the SADC region can immensely profiteer from findings of this study and build-up of the learned lessons to circumvent and overcome similar challenges confronting e-government adoption and utilisation efforts. Moreover, the revised PDEGAUM conceptual model can be of great use to other researchers seeking an in-depth understanding of how to overcome hindrances to e-government adoption to achieve widespread utilisation of such systems by citizens.

Against the backdrop of money being invested into e-government projects, the subsequent high level of failing projects (as critically evaluated and discovered by the corpus of literature in Chapter 2) and the lack of adoption of such systems by citizens in most developing countries, the researcher posits that the PDEGAUM conceptual model provides a holistic solution.

9.5 Practical Implications

The corpus of literature reviewed in Chapters 2 and 3 has underscored the widespread adoption and utilisation of e-government systems by citizens as an indicator for the success of the system. Moreover, the empirical findings of this study confirmed the literature on e-government by upholding that citizens who were aware of the benefits of adopting and using e-government systems were bound to be more motivated to use such systems. Therefore, the practical lessons emerging from the findings of this research study are as follows:

- This study makes substantial novel contributions in the form of a PDEGAUM conceptual model for use by practitioners to guide their decisions on formulating policies and promoting the adoption and utilisation of e-government systems by citizens. Therefore, the validated conceptual model provides a holistic approach to addressing the numerous challenges found by this study to be thwarting the adoption and utilisation efforts. Moreover, the PDEGAUM conceptual model encompasses a set of decomposed factors that offers an essential and flexible strategic planning and managerial tool for practitioners to address issues relating to e-government implementation, adoption, and utilisation. Thus, this study provides a novel approach to addressing complexities that were associated with e-government systems in developing nations by highlighting key factors that encourage positive attitudes in citizens towards accepting and using e-government systems.

- From the citizens' perspective of e-government systems, a number of catalyst factors (demand/people-driven, see Figure 8-1) were established by this study and considered indispensable for informing the rollout of e-government systems. The lack of citizen engagement on e-government matters and the lack of targeted awareness campaigns using a multi-channel approach resonated from the qualitative findings of this study. Considering this, the proposed PDEGAUM conceptual model offers a platform for policymakers to establish and well-coordinated their efforts and actions in the provision of the required e-government systems by citizens. By so doing, governments are bound to minimise citizens' resistance in adopting and utilising such systems since it is considered that they will be part and parcel of the whole project initiative to which they hold some allegiance.

- The significance of the Price Value independent variable as an impeding factor to citizens' behavioural intention to adopt e-government systems in the SADC context was discerned and worth noting by practitioners responsible for policy formulation. As the cost of accessing internet and e-government related services escalate, people's behavioural intention to use such services was reduced. The pricing structures of internet data bundles should be regulated and governed by policy makers in government to ensure widespread allowability amongst citizens. Without having this addressed and having the internet as the backbone for channelling e-services, national goals for creating a knowledge society through e-inclusion can never be achieved.

- Likewise, from the citizens' perspective, the level of education (as informed by education and support catalyst factor in Figure 8-1) exerted a significant positive impact on both behavioural intention to adopt and use behaviour. More so, the majority of citizens have attributed their lack of adoption of e-government systems to the lack of knowledge and relevant technical skills. In this regard, findings of this study underscored the need for policymakers to seriously consider the formulation and implementation of policies for both horizontal and vertical integration of ICT skills in citizens. To start with, the governments may target primary schools, secondary schools, colleges, and universities and make basic computer skills courses, covering the internet and e-services compulsory. Such gestures will go a long way in boosting the confidence and ICT skills (experience in use), creating awareness and overcoming technophobia-related barriers in citizens. This will go a long way in creating a knowledge society.

- Trust in e-government systems is built on the long-established reputation of the robustness of privacy and security features offered on transactions and personal data on these systems. The significant effects of privacy, security, and trust in both citizens' behavioural intention to adopt and use behaviour were confirmed by the results of this study. This implied that policymakers on ICT and e-government should clearly formulate and implement security policies that are backed by the legal framework in order to build citizens' trust in e-services. Such move will deter and provide a legal framework for convicting possible cyber criminals and stimulate positive attitudes in citizens towards adopting and using e-government systems.

Whilst the results of this study demonstrate a brighter outlook of the practical implementation on the model in the SADC region, they also reaffirm that on the theoretical-side e-government acceptance is impacted by other constructs like social influence and habits, effort expectancy, and facilitating conditions. Moreover, the results inform practitioners that citizens were motivated and attracted to use e-government systems that had current information and that was easier to find the required information with the minimum possible navigation clicks. It is also advisable and recommended to practitioners to adopt as good implementation practice the inco-operation of help and web accessibility features on e-government systems. Consequently, such features assist e-government system users to discover specific information easily and thus, reduce the effort expectancy required when interacting with such systems. The aforementioned practical implications, if adopted to inform the implementation of people driven e-government systems in the SADC region, the researcher believes that most of the challenges currently being encountered regarding low adoption and utilisation can be overcome.

9.6 Research Limitations

This research study has successfully achieved its aim and objectives; and answered adequately all the main research questions defined in Chapter 1. Moreover, the research findings are rigour in-line with the explanatory sequential mixed methods used to collect the empirical data and validate the PDEGAUM conceptual model. Despite these achievements, time and effort dedicated, the researcher acknowledges some limitations of this research study:

- The researcher is a full-time lecturer at one of the previously disadvantaged university in South Africa where the teaching loads are overwhelming, and at the same time, a PhD student who had to finish his PhD research study within the 3 to 4 years' timeframe. To strike a balance between work, studies and family matters posed one of the greatest challenges in terms of time management, personal organisation and dedication, and resilience testing of the researcher. Against this backdrop and more time permitted, further insights and value to the study would have been achieved by this study.
- The G2C e-government domain is so complex due to the interplay of the citizen and government sides for a complete understanding of the adoption, implementation, and utilisation of e-government systems. However, the focus of this study was confined to understanding factors that stimulate or discourage the adoption and utilisation of e-

government systems on the citizen-side of the G2C domain. Hence, the study would have been more robust, complete and rich in views regarding 'what informs and impedes e-government implementation efforts' had the government-side been considered.

- Although the explanatory sequential mixed methods adopted in this study provided a deeper understanding of the phenomenon under study, some limitations in its use were encountered. It's effective application required the researcher to have sound knowledge of analysing both the quantitative data (using the IBM SPSS and IBM Amos software packages) and the qualitative data (using Nvivo software packages) and how to mix the methods and results. The learning curve for mastering the effective practical use of the software packages was involving, demanding and time-consuming. Moreover, the quantitative data collection and analysis processes had to be completed first in order to inform the start of the qualitative strand. Thus, prolonging the time for carrying out the data gathering and analysis phases.
- Even though this study was covering two SADC member states (Zimbabwe and Zambia) due to financial and personal capacity constraints to cover many countries; caution should be taken when generalising the findings to other developing countries and regions due to varying socio-political and economic conditions.

9.7 Personal Reflection

Personal reflection is a fundamental aspect that deepens learning through taking an objective view, retrospectively of the PhD learning journey, regarding what has been learnt, why was it necessary to study it in the first place and how the learning itself unfolded to achieve the aim and objectives of this research study. During the whole of this study, the researcher has acquired some fundamental skills. At the commencement of the PhD journey, the researcher developed and relied heavily on reading, critiquing, information sifting and organisation skills to write the research proposal.

At this point, the PhD supervisor used the nurturing supervision approach by giving the maximum possible assistance, suggestions and reading material to focus the researchers' reading.

Once the research proposal was finalised, the raised issues by the Higher Degrees Committee were incorporated; the research drafted an outline of the possible chapters and subtopics for the thesis. In conjunction with the research plan drafted in the research proposal; the chapters and subtopic outline were used to setup milestones which clearly outlined the new skills that were required to achieve specific subtasks (chapters). By so doing, the researcher exercised and developed great time management and self-organisation skills required for dedicating his effort for the timely completion of the thesis.

Moreover, by adopting the explanatory sequential mixed methods approach in this study, the researcher was required to develop and master new statistical and analytical competencies and have an in-depth understanding of the three software packages that were found suitable for the quantitative (IBM SPSS and IBM Amos) and qualitative (Nvivo) data analyses. Mastering the software packages and simultaneously use them for effective analysis was never easy; it called for the researcher's perseverance, whilst constrained by the time-factor. Moreover, the whole write-up process called for the researcher to develop strong back and forward tracking and chapter linking-up skills to ensure the smooth flow of ideas to adequately answer the research questions of this study.

Reflecting on the overall learning and coaching (interaction) process between the researcher and the supervisor; the researcher is indebted to the promoter for his mastering of the practical application of the Game Theory (Nash, 1950) (though not used directly in this research study). The game theory was never taught or introduced formerly to the researcher; but through the conduct and coaching style of the promoter, the game theory was operationalised. Briefly, the game theory applies when two or more interdependent parties (researcher and convenor) are engaged in decision making processes in which they should "formulate, structure, analyse, and understand strategic scenarios" (Turocy & von Stengel, 2001:4) and choices to address a problem consensually. The PhD journey was punctuated with moments of establishing novel contributions by the researcher, with the promoter constructively critiquing the work to give a clearer and broader perspective to the researcher for discovering novel insights.

Considering the aforementioned points, the researcher acknowledges that this PhD journey was informative, enlightening and a defining moment in life for skills development and it has transformed him into a versatile researcher and person that is all-rounded to tackle head-on challenges timeously.

9.8 Future Research Direction/Recommendations

Any research is subjected to and open to critique, calling for further improvements, and the current research study is no exception. The researcher acknowledges that there are some grey areas in this research study which can be explored further in order to broaden the knowledge on e-government adoption and utilisation. Such recommendations for future research direction are as follows:

- **Recommendation 1.** The focus of this research study was on the 'citizen-side' of the G2C domain. Thus, the 'government-side' was outside the scope of this study. Yet, it is a very crucial source of information related to the 'supply-side' (implementation) of e-government systems. However, a holistic understanding of the factors affecting the adoption and utilisation of e-government systems in the SADC region requires views and input from all stakeholders. Going further with this research study, the researcher recommends the participation of decision and policy makers (practitioners) on e-government matters in data gathering.
- **Recommendation 2.** The corpus of literature reviewed in Chapters 2 and 3 has underscored that the success of e-government systems is measured by its widespread acceptance, adoption, and utilisation by citizens. The focus of this study was to investigate factors affecting the adoption and utilisation of e-government systems yielding to the proposal of a conceptual model that could be used for stimulating the adoption and utilisation of such systems in the SADC region. However, the researcher recommends that the scope of this inquiry could be broadened by identifying and testing new constructs that are relevant for measuring e-government success in-line with the adoption and utilisation of such systems.
- **Recommendation 3.** This research used Zimbabwe and Zambia as a case study to investigate e-government adoption and utilisation by citizens. However, it has been pointed out clearly in Chapter 2 of this thesis that the socio-political and economic conditions vary immensely across the fifteen SADC member states. Therefore, it is recommended that the suitability and applicability of the proposed PDEGAUM conceptual model and the generalisation of the overall findings to the SADC region should be tested further by extending the study to include other regional countries. By so doing, comparative analysis on the suitability of the used constructs, methodology and the findings could be drawn for the broader understanding of e-government adoption and utilisation trends across the SADC region.

- **Recommendation 4.** Finally, the G2C e-government domain has some common elements with the Business-to-Consumer (B2C) e-Commerce domain. However, the literature has demonstrated some economies of scale and great efficiencies in the B2C domain; possibly, being attributed to the economic-focus nature of the domain and the profound need to ward-off intense competition in the private sector. Nevertheless, an investigation of the factors driving the success of the B2C domain could lead to a holistic understanding and approach to identifying novel factors for stimulating e-government adoption and utilisation by citizens. Furthermore, such novel factors could assist in enhancing the explanatory power of the PDEGAUM conceptual model proposed by this study.

9.9 Research Conclusion

This chapter provides the conclusion of this research study, reciting the final results, novel contributions, the practical implications, limitations of the methodology used and the findings; self-reflection and recommendations for future research direction.

The findings of this study have confirmed the critical factors affecting e-government adoption and utilisation in the context of the SADC region by proposing and validating the all-inclusive PDEGAUM conceptual model. This study has contributed significantly to knowledge by attempting to fill in the four research gaps (theoretical, empirical, contextual and substantive) in e-government adoption and utilisation identified in Chapter 2 for the SADC region.
Therefore, this research study is unique in that it has applied a holistic approach (in which demand-driven catalyst factors informs supply-driven decisions and actions; using both quantitative and qualitative inquiries) to address the research gaps and fulfil the research aim.

Finally, the findings of this research have significant implications for researchers and practitioners (policy and decision makers, and implementers) who are eager and ready to adopt new ways of addressing the host of challenges confronting e-government adoption and utilisation by citizens in the SADC region and other developing countries facing similar socio-economic circumstances.

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APPENDIXES

Appendix 1: Research Survey /Interview Cover Letter

Dear Sir/Madam

My name is Willard Munyoka, a PhD Student at the University of KwaZulu-Natal, Durban, South Africa, in the School of Management, Information Technology and Governance. I am conducting a study to investigate the factors that affect the adoption and utilisation of e-government systems by citizens in the SADC region. In briefly, e-government refers to the use of Information and Communication Technologies (ICTs) like the Internet, smartphones, computers etc. by government agencies to offer their services online to citizens, business and other stakeholders with the aim of achieving more effective and efficient public service delivery to citizens. Also, e-government empowers citizens by offering a platform for participating (on-line) and having a voice in government matters.

Currently, little is known about the available e-government initiatives and the adoption and utilisation by citizens. A wide number of factors could be affecting citizens' intentions to adopt and use e-government systems and this study seeks to establish such factors. The information you are going to provide in this interview shall be used for analysing e-Government adoption and utilisation levels by citizens and then proposes an e-government adoption and utilisation conceptual model that could be used as a decision and policy making tool in government by practitioners to stimulate system utilisation by citizens. Your participation is valuable to the successful completion of this research. All the gathered data and information from participants shall be treated with great confidentiality, professionalism and will be used solely for the purpose of attaining the aim and objectives of this study and nothing else.

Finally, I am requesting for your permission to take notes, audio tape and record information accurately during the interview as this will assist me during the data analysis phase. I kindly and politely thank you for your generous participation in this research survey/interview and contributions; and by so doing, making this research study a success.

Note:

If you would like to receive a copy of the results and findings of this inquiry kindly fill-in and tear-off the slip below:

Name : .....

Phone no. : .....

E-mail : .....

Postal Address: .....

Appendix 2: Survey Questionnaire

Section A: Demographic Details

For each item below, please select your best response applicable to you writing an (**X**) in the empty box or write the required details in the space provided.

Question 1:

What is your gender? (Tick one option only!)	
Female	
Male	

Question 2:

What is your age? (Tick one option only!)	
Older than 18 but younger than 25	
Older than 25 but younger than 35	
Older than 35 but younger than 45	
Older than 45 but younger than 55	
Older than 55 but younger than 65	
Older than 65	

Question 3:

What is your home language? (Tick one option only!)	
Bemba	
English	
Kaonde	
Lozi	
Ndau	
Ndebele	
Nyanja	
Shona	
Tonga	
Venda	
Other (Specify):…….……..	

Question 4:

What is your Nationality? (Tick one option only!)	
Zambian	
Zimbabwean	
Other (Specify):…..…….....	

Question 5:

Where do you live? (Tick one option only!)	
Chongwe	
Kafue	
Luangwa	
Lusaka Central	
Harare Urban	
Harare Rural	
Chitungwiza	
Epworth	

Question 6:

What is your highest education qualification? (Tick one option only!)	
Secondary School-leaving Certificate	
Certificate	
Diploma	
Degree	
Masters	
Doctorate	
Others (Specify):……..…	

Question 7:

What is your current occupation status? (Tick one option only!)	
Government employee	
Private Sector employee	
NGO employee	
Student	
Self-employed	
Unemployed	
Others:……..…	

Section B: Your experience in using ICTs

Question 8:

How many months/years of experience do you have in using a computer? (Tick one option only!)	
None	
Less than 6 months	
More than 6 months but less than 1yr	
More than 1 yr but less than 2 yrs	
More than 2 yrs but less than 5 yrs	
More than 5 yrs	

Question 9:

How many months/years of experience do you have in using a smartphone? (Tick one option only!)	
None	
Less than 6 months	
More than 6 months but less than 1yr	
More than 1 yr but less than 2 yrs	
More than 2 yrs but less than 5 yrs	
More than 5 yrs	

Question 10:

How often do you use Internet? (Tick one option only!)	
Daily	
Once per week	
Once per month	
Not Using **(Then go to Section D)**	
Other (Specify:……..	

If your answer to Q10 is 'not using', then go to Section D, else continue.

Question 11:

From which of the listed places below do you use Internet? (Tick all that applies to you)	
Work	
Home	
University	
Other (Specify:……)	

Question 12:

From which of the listed places below do you access Internet? (Tick all that applies to you)	
Work	
Home	
University	
Other (Specify:……	

Section C: Citizen's access to and use of e-Government systems

This section gives you the opportunity to express your perception and experience of using e-government systems in-line with various questions that follows.

Carefully read through the statements and indicate the extent to which you agree or disagree by writing an **(X)** in the empty box or write the required details for your most applicable response.

Question 13:

How often do you use e-Government services? (Tick one option only!)	
Daily	
Once per week	
Once per month	
Yearly	
Others (Specify:……..)	
No, not at all **(Then go to Section D) – for those people using internet; BUT not E-Government systems!**	

Question 14:

For which of following country/(ies) did you use e-Government services? (Tick all that applies to you!)	
Zambia	
Zimbabwe	
South Africa	
Others (Specify:……..)	

Question 15:

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
I have used the following e-Government systems when interacting with a government department. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) Agricultural e-Gov services					
2) Anti-corruption issues					
3) Birth and death, citizenship, passport, ID, VISA services					
4) Business registration and deregistration					
5) Central Government information access					
6) Communication-related issues					
7) Consumer Protection					
8) Customs services					
9) Driving Licence/Register vehicle/Roadworthiness					
10) Education and Training services					

11) Health-related services					
12) Labour/employment-related issues/Permits					
13) Land Issues					
14) Ministerial Departments					
15) Municipality services					
16) Office of the President					
17) Tax Returns Filling					
18) Tendering & Procurement					
19) TV and postal services					
20) Other e-Gov service used					

Question 16:

In your view, do you think the benefits of using e-Government services have been adequately explained to citizens? (Tick One Option only!)	
Yes, very much	
Yes, But (Explain……)	
No, not at all	

Question 17: (E-GOVERNMENT AWARENESS)

1 = Not Sure; 2 = Disagree; 3 = Neutral; 4 = Agree				
Respond to the following questions and statements in-line with the action (s) being taken by your government to assist citizens to use e-government systems. (Give response for each!)	**Agree**	**Neutral**	**Disagre**	**Not Sure**
1) In your view, do you think the benefits of using e-Government systems have been adequately explained to citizens?				
2) E-Government awareness to citizens on TV				
3) E-Government awareness to citizens at government offices				
4) Educating citizens about the benefits of using e-Government services				
5) Exhibition vans giving hands-on orientation & training to Citizens				
6) Provision of e-Government service delivery outlets in our locality				
7) I am not aware of any actions taken or assistance was given				

8) I have been consulted in government surveys on e-Government service-related issues before.				

Question 18: (PERFORMANCE EXPECTANCY)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
Based upon your experience in using e-government services, to what extent do you agree or disagree with the following statements on the usefulness of e-government services. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) The use of e-government services provides me with savings in terms of time by not travelling to government offices.					
2) The use of e-government services provides me with savings in terms of transport costs to-and-from government offices.					
3) E-Government website enables me to effectively communication with government.					
4) The use of e-Government services leads to improvement in the way government offers its services to citizens.					
5) The use of e-Government gives me an equal opportunity to do business with the government, just as any other citizens.					

Question 19: (EFFORT EXPECTANCY)

1 = Very Difficult; 2 = Difficult; 3 = Neutral; 4 = Easy; 5 = Very Easy					
Respond to the following questions and statements on how easy it is for you to learn and use e-government systems for the first time. (Give response for each!)	**Very Easy**	**Easy**	**Neutral**	**Difficult**	**Very Difficult**
1) How easy is it to learn to use e-government services on your own and be able to complete your desired task online?					
2) How easy is it to navigate around e-Government websites and access your desired service?					
3) How easy do e-Government systems permit you to freely and easily communicate with government officials?					
4) How easy do e-Government systems permit you to complete a task?					

Question 20: (FACILITATING CONDITIONS)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
In line with the assistance given to you or actions taken by your government to easy the utilisation of e-Government systems by citizens, respond to the following statements. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) Government should offer incentives to encourage use of e-Government services.					
2) Government offers allowable training and support to citizens on how to use e-government systems.					
3) ICT devices and data bundles required to access e-government systems are expense for me.					
4) The availability of vernacular/native language on E-Government systems allows me to understand and execute tasks easier.					

Question 21: (SERVICE QUALITY AND INFORMATION)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
To what extent do you agree or disagree with the following statements regarding the quality of e-government services you receive? (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) E-Government services provide accurate and dependable information.					
2) E-Government services provide up-to-date information.					
3) E-Government services provide 'easy-to-understand' information.					
4) E-Government services provide 'easy-to-understand' information.					
5) E-Government systems provide me with adequate content and links to relevant information to satisfy my service requirements.					
6) I am happy with the speed of e-Government service systems.					
7) E-Government services provide satisfactory quality services.					

Question 22: (PRIVACY, SECURITY AND SECURITY)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
In terms of privacy, security and trust in using e-Government systems, to what extent would you agree or disagree with the following statements? (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I feel that e-Government service providers cannot be trusted.					
2) I feel that e-Government systems guarantee privacy protection to personal information.					
3) I feel that transactions are secure over e-Government systems.					
4) I feel there are effective legal structures to protect users from problems faced whilst using e-Government systems.					
5) I feel that a lot should be done before e-government systems can be trusted and meet my needs.					
6) I feel that the internet cannot be trusted					
7) E-Government system I have used have a privacy statement					
8) I fear the lack of security on e-Government systems.					
9) I perceive high risks associated with the use of e-Government systems.					

Question 23: (SOCIAL INFLUENCE AND HABITS)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
To what extent would you agree or disagree that social influence from people close to you played a role in your use of e-government systems? (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I would use e-Government services based upon recommendations from friends' experience with it					
2) Government sector and Parastatals encouraged me to use e-Government service systems.					
3) I was encouraged by awareness campaigns and hands-on training on how to use e-government systems by government department					
4) I would use e-government services if I feel I have to use it without anyone's influence					

Question 24: (BEHAVIOURAL INTENTION TO USE CONTINOUSLY E-GOV SYSTEMS)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
Respond to the following statements regarding your plans for utilizing e-government systems. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I plan to continue using a smartphone to access e-Government systems in the future.					
2) I plan to continue using a computer to access e-Government systems in the future.					
3) I plan to use other e-Government systems to access all essential public services that are online.					

Question 25: (USE BEHAVIOUR)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
Respond to the following statements regarding your utilisation behaviour of e-government systems. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I frequently use e-government systems.					
2) I only use selected e-government systems					
3) Most of my interactions with government are done through e-government systems.					

Section D: Factor affecting non-users of internet and/or e-Government Systems

This section gives you the opportunity to express your perception in-line with factors that are affecting (or have affected) your intentions of using e-government systems.

For each item below, please select your best response(s) applicable to you by writing an (**X**) in the empty box or write the required details in the space provided.

Question 26: (EFFORT EXPECTANCY)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
In line with your perceived degree of ease associated with the use of the internet and e-Government systems, respond to the following statements. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
21) I would like to use the internet but it is difficult to use.					
22) I would like to use e-government systems but there are no options for vernacular language which could assist me to perform tasks much easier.					
23) I would like to use e-government systems, but they are not easy-to-use.					

Question 27: (FACILITATING CONDITIONS)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
In line with the assistance given to you or actions taken by your government to facilitate the adoption of e-Government systems by citizens, respond to the following statements. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I would like to adopt e-government, but I lack the relevant skills required to use e-government.					
2) I would like to use e-government, but the unavailability of ICT infrastructure prohibits me.					
3) There are readily available structures and personnel at government offices to assist if I encounter problems on e-government systems.					

Question 28: (E-GOVERNMENT AWARENESS)

1 = Not Affected; 2 = Neutral; 3 = Affected; 4 = Strongly Affected				
Respond to the following statements in-line with how your consciousness or lack of it has affected your behavioural intention to adopt e-government systems. (Give response for each!)	**Strongly Affected**	**Affected**	**Neutral**	**Not Affected**
1) I do not know what e-Government is.				
2) Lack of outreach awareness campaigns by the government to citizens on the benefits of using e-government services.				
3) Lack of knowledge of the existence of e-government systems.				

Question 29: (PRIVACY, SECURITY AND SECURITY)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
In terms of your perception of the privacy, security and trust on e-Government systems, to what extent would you agree or disagree with the following statements? (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I intend to adopt e-government systems but I fear lack of security.					
2) I intend to adopt e-government systems but I feel that the systems cannot be trusted.					
3) I feel that e-Government systems do not guarantee privacy protection to personal and confidential information.					

Question 30: (PRICE VALUE)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
To what extent has the price value of ICT devices and data bundles has affected your intentions to adopt e-government systems? (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) Internet charges are unallowable for me.					
2) I can't allow to have ICT device to access the internet.					
3) I can't allow the costs of acquiring ICT skills required for me to adopt e-Government systems.					
4) Unavailability of ICT infrastructure to access e-government systems (these include computers, smartphones, tablets, personal digital assistants etc.)					

Question 31: (BEHAVIOURAL INTENTION TO ADOPT E-GOV SYSTEMS)

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree					
Respond to the following statements regarding your plans for adopting e-government systems. (Give response for each!)	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
1) I intend to use a smartphone with internet connectivity.					
2) I intend to adopt e-government systems.					
3) Given the opportunity, I am willing to use e-government system.					

Question 32:

1 = Very Difficult; 2 = Difficult; 3 = Neutral; 4 = Easy; 5 = Very Easy					
Given the opportunity to use e-government systems; how important is each of the following e-government systems? (Give response for each!)	**Not Important**	**Less Important**	**Neutral**	**Important**	**Very Important**
1) Electronic application of personal documents i.e. birth and death, citizenship, passport, ID					
2) Obtain information on agricultural services					

3) Obtain information on business registration and deregistration					
4) Central government information access					
5) File for customs services					
6) Process traffic information					
7) Access online training and training services					
8) Access health related information and services					
9) Labour/employment-related issues					
10) Perform online banking services					
11) Access services from ministerial departments					
12) Payment of municipal service bills					
13) Accessing and reading policy documents online					
14) E-tendering and e-procurement					
15) TV and postal services bill payments					
16) Searching for employment-related information and application					

Question 33: (SUGGESTIONS FOR IMPROVING E-GOV ADOPTION)

What do you think should be done by government to promote the adoption of e-government systems by citizens in your country? **Please write your thoughts and suggestions in the space below:**
…… …… …… …… …… …… …… ……

Thank you for your time dedicated to complete this Questionnaire!

Appendix 3: Interview Questions for e-Gov System Users

1. What experienced do you have of using computers or any other mobile devices with computer-capabilities and access to the internet?

2. Does your level of education play any role in your usage of e-Government systems? Explain.

3. Explain how (if at all) your experience in using computers and the internet has influenced your utilisation levels of e-Government systems?

4. What strategies are being used by your government to create awareness and encourage citizens to know about the availability of and use e-Government systems?

5. Explain how easy it was for you to learn to use e-Government systems and become competent? What could be your suggestions to the government in-line with ease of use of e-government systems?

6. Can you explain who influence (or encouraged) you to use e-Government systems?

7. In your opinion and personal experience with e-Government systems, can you comment on the quality of services in terms of adequateness of content, how often it's updated and availability of enough links to relevant information?

8. In your opinion do you feel e-Government systems can be trusted with your personal and confidential information? If not, what do you suggest should be done by government to instil trust and confidence in citizens?

9. In your opinion, do you think that e-Government systems offer sufficient privacy and security to transactions and personal information? Can you justify your answer?

10. In your opinion what do you think should be done by your government to encourage and promote citizens to use e-Government systems?

Appendix 4: Interview Questions for non-users of e-Gov Systems

Interview Questions

1. Does your level of education have any effect on your behavioural intention to adopt e-Government systems? If yes; please explain in what ways.

2. What do you suggest should be done by your government to increase citizen's awareness of and promote the utilisation of e-government services in your country?

3. What action is taken or assistance given to citizens by your government to facilitate the use e-Government systems in your country?

4. How has your perception of security, privacy and trust on e-Government systems affected your intentions to adopt e-Government?

5. What other factors could be impeding your adoption of e-government systems?

Thank you for participating!

Appendix 5: Statement of Ethics Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

13 May 2015

Mr Willard Munyoka (214582348)
School of Management, IT & Governance
Westville Campus

Dear Mr Munyoka,

Protocol reference number: HSS/0410/015M
Project title: The adoption and utilization of e-Government initiatives by citizens in the SADC Region: The case of Zambia and Zimbabwe

Full Approval – Expedited Application

With regards to your application received on 24 April 2015. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and **FULL APPROVAL** for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

[redacted]

Dr [redacted]

/ms

Cc Supervisor: Professor Manoj Maharaj
Cc Academic Leader Research: Professor Brian McArthur
Cc School Administrator: Ms Angela Pearce

Appendix 6: Confidentiality Statement & Consent Letter

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF MANAGEMENT, IT & GOVERNANCE
WESTVILLE CAMPUS
DURBAN

Dear Respondent,

PhD Research Project
Researcher: Willard Munyoka (+27 718376043)
Supervisor: Prof. Manoj Maharaj (+27 332605605)
Research Office: Ms. P Ximba (+27 31 260 3587)

I, (**WILLARD MUNYOKA)** a **PhD** student at the **MANAGEMENT**, **INFORMATION TECHNOLOGY AND GOVERNANCE School** of the University of Kwazulu Natal kindly invites you to participate in a research project entitled **The Adoption and Utilisation of e-Government systems by citizens in the SADC Region: the case of Zambia and Zimbabwe**. The aim of this study is to: **develop an all-inclusive-people-driven e-government adoption and utilisation conceptual model that takes into account the crucial factors affecting the adoption and utilisation of e-government systems by citizens in the SADC region. Such a conceptual model shall guide e-government policy makers in national development strategies and decision making process for effective e-government adoption and utilisation in the public sectors of developing countries.**

Through your participation I hope to understand **the factors that are affecting citizens' decisions to adopt and use e-government systems**. The results of the survey are intended to contribute to **the development of a people-driven e-government adoption and utilisation conceptual model.**

Your participation in this project is voluntary and invaluable for the successful completion of this project. However, you are free to participate, terminate or withdraw from the project at any time. This research study is purely academic and as such there will be no monetary gain for participating in this survey. Confidentiality and anonymity of records identifying you as a participant will be maintained by the **MANAGEMENT, INFORMATION TECHNOLOGY & GOVERNANCE SCHOOL**, **UKZN**.

If you have any questions or concerns about completing the questionnaire or about participating in this research study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about **15** minutes to complete. I hope you will dedicate and spare your valuable time to complete this survey and make the research a success.

Sincerely

Investigator's signature__[redacted]_____ Date___04/02/2015___

INFORMED CONSENT LETTER

I…… (Full name of participant) hereby confirm that I understand the contents of this document and the nature of the research project being undertaken, and I consent to participating in the research project.
I understand that I am at liberty to withdraw from the project at any time, should I so desire. I hereby consent / do not consent to have this interview recorded.

SIGNATURE OF PARTICIPANT DATE

…… ……

Appendix 7: Questionnaire Statement-Construct Variable Correlations

1. Associated with e-Government Users (Use Behaviour)			
Construct	Variable Code	Questionnaire Statement	Motivation (References)
Performance Expectancy (PE)	PE1	The use of e-government services provides me with savings in terms of time by not travelling to government offices.	Ha (2016); Karunasena & Deng (2012)
	PE2	The use of e-government services provides me with savings in terms of transport costs to-and-from government offices.	Bai (2013); Nabafu, & Maiga, (2012); Bertot, Jaeger & McClure (2008).
	PE3	E-Government website enables me to effectively communication with government.	Ha (2016); Alshehri & Drew (2010).
	PE4	The use of e-government services leads to improvement in the way government offers its services to citizens.	VCCI (2014); Rao & Krishna (2013).

	PE5	The use of e-government gives me an equal opportunity to do business with the government, just as any other citizens.	AlAwadhi & Morris (2009); Alshehri & Drew (2010).
Effort Expectancy (EE)	EE1	How easy is it to learn to use e-government systems on your own and be able to complete your desired task online?	Samuel (2014); Boone (2012)
	EE2	How easy is it to navigate around e-government websites and access your desired service?	Venkatesh, Hartmut & Ruba (2014); Alsaif (2013).
	EE3	How easy do e-government systems permit you to freely and easily communicate with government officials?	Abdalla (2012); UN E-Government Survey (2014)
	EE4	How easy do e-government systems permit you to complete a task?	Lee & Kozar (2012); Novakouski & Lewis (2012)
Social Influence and Habits (SIH)	SIH1	I would use e-government services based upon recommendations from friends' experience with it.	Alathur, Ilavarasan & Gupta (2016); Khalil (2011); Nadi (2012).
	SIH2	Government sector and Parastatals encouraged me to use e-government service systems.	Kanungo & Jain (2011); Abu-Shanab & Bataineh (2014)
	SIH3	I was encouraged by awareness campaigns and hands-on training on how to use e-government systems by government department	Kanungo & Jain (2011); Sharma, Bao & Peng (2014)
	SIH4	I would use e-government services if I feel I have to use it without anyone's influence.	Al-Hujra, Al-dalahmeh & Aloudat (2011); Beaudry & Pinsonneault, (2010).
Privacy, Security and Trust (PST)	PST1	I feel that e-Government service providers cannot be trusted.	Million (2016); Al-Khouri, Farmer & Qadri (2014)
	PST2	I feel that e-government systems guarantee privacy protection to personal information.	Chung & Kim (2016a); Chung & Kim (2016b)
	PST3	I feel that transactions are secure over e-government systems.	Serra et al. (2015); OECD (2016)
	PST4	I feel there are effective legal structures to protect users from problems faced whilst using e-government systems.	Alshehri & Drew (2010); Şerban, Ştefan, & Ionesc (2014)
	PST5	I feel that a lot should be done before e-government systems can be trusted and meet my needs.	Venkatesh, Thong, Chan & Hu (2016); United Nations (2016a)

	PST6	I feel that the internet cannot be trusted	Papadomichelaki & Mentzas (2012)
	PST7	E-Government system I have used have a privacy statement	Zhou (2011); Venkatesh et al. (2016)
	PST8	I fear the lack of security on e-government systems.	Al-Khouri et al. (2014); Şerban et al. (2014)
	PST9	I perceive high risks associated with the use of e-government systems.	Bélanger & Carter (2008); Al Khattab et al. (2015)
Service Quality and Information (SQI)	SQI1	E-Government services provide accurate and dependable information.	Detlor, Hupfer, Ruhi, & Zhao (2013); Merhi & Koong (2016).
	SQI2	E-Government services provide up-to-date information.	Detlor, Hupfer, Ruhi & Zhao (2013)
	SQI3	E-Government services provide 'easy-to-understand' information.	Merhi & Koong (2016); Hasan & Abuelrub (2011).
	SQI4	I am satisfied with using e-government services.	Hung, Chang, & Kuo (2013); Susanto & Goodwin (2013).
	SQI5	E-Government systems provide me with adequate content and links to relevant information to satisfy my service requirements.	Hofmann, Beverungen, Räckers & Becker (2013); Detlor, Hupfer, Ruhi & Zhao (2013)
	SQI6	I am happy with the speed of e-government service systems.	Kao, & Lin (2016); Guha & Chakrabarti (2014)
	SQI7	E-Government services provide satisfactory quality services.	Detlor, Hupfer, Ruhi & Zhao (2013)
E-Government Awareness (EA)	EA1	In your view, do you think the benefits of using e-government services have been adequately explained to citizens?	Al-hashmi & Suresha (2013); Shuqin et al. (2016)
	EA2	E-Government awareness to citizens on TV	Yonazi et al., (2010); Shuqin et al., (2016)
	EA3	E-Government awareness to citizens at government offices	Nkwe (2012); Al-Shboul et al., (2014)
	EA4	Educating citizens about the benefits of using e-government services	Al-Shboul et al., (2014); Sorn-in et al., (2015)
	EA5	Exhibition vans giving hands-on orientation & training to citizens	Ruhode (2016); Albesher (2015)
	EA6	Provision of e-government service delivery outlets in our locality	Venkatesh, Sykes, Venkatraman (2013)

	EA7	I am not aware of any actions taken or assistance was given	Alshehri (2012); Alsaif (2013)
	EA8	I have been consulted in government surveys on e-government service-related issues before.	United Nations (2016)
Facilitating Condition (FC)	FC1	Government should offer incentives to encourage use of e-government services	Salimon et al., (2016); Davies (2015)
	FC2	Government offers allowable training and support to citizens on how to use e-government systems.	Otieno et al., (2016); Bwalya (2014)
	FC3	ICT devices and data bundles required to access e-government systems are expense for me.	Kuzma (2009); Perucca & Sonntagbauer (2014)
	FC4	The availability of vernacular/native language on e-government allows me to understand and execute tasks easier.	Njuru (2011); Curristine, Lonti & Joumard (2007)
Behavioural Intention (BI)	BI1	I plan to continue using a smartphone to access e-government systems in the future.	Shizha & Kariwo (2011): Almarabeh et al., (2016)
	BI2	I plan to continue using a computer to access e-government systems in the future.	ITU (2015); Poushter & Stewart (2016)
	BI3	I plan to use other e-government systems to access all essential public services that are online.	Al Khattab et al., (2015); Ha (2016)
Use Behaviour (USE)	USE1	I frequently use e-government systems.	Poushter & Stewart (2016); World Bank (2016d)
	USE2	I only use selected e-government systems	Alshehri (2012); Ha (2016)
	USE3	Most of my interactions with government are done through e-government systems.	United Nations (2016); Ha (2016)
2. Associated with non-users of e-Government (Behavioural Intention)			
Construct	Variable Code	Questionnaire Statement	Motivation (References)
Effort Expectancy (EEn)	EEn1	I would like to use the internet but it is difficult to use.	Zickuhr (2013); Poushter & Stewart (2016)
	EEn2	I would like to use e-government systems but there are no options for vernacular language which could assist me to perform tasks much easier	ITU (2015b); Munyoka & Manzira (2013)

	EEn3	I would like to use e-government systems, but they are not easy-to-use	Agangiba & Kabanda (2016); ITU (2008)
Facilitating Conditions (FCn)	FCn1	I would like to adopt e-government, but I lack the relevant skills required to use e-government.	World Economic Forum, (2015a); Fatouma, Lei & Abdoulkarim (2016)
	FCn2	I would like to use e-government, but the unavailability of ICT infrastructure prohibits me.	Nyirenda-Jere & Biru (2015); Boone (2012)
	FCn3	There are readily available structures and personnel at government offices to assist if I encounter problems on e-government systems.	Alshehri (2012); Nyirenda-Jere & Biru (2015)
Privacy, Security and Trust (PSTn)	PSTn1	I intend to adopt e-government systems but I fear lack of security.	Khan (2016); Zhao & Zhao (2010)
	PSTn2	I intend to adopt e-government systems but I feel that the systems cannot be trusted.	Khan (2016); Zhao & Zhao (2010)
	PSTn3	I feel that e-government systems do not guarantee privacy protection to personal and confidential information.	Davies (2015); Khan (2016)
Price Value (PVn)	PVn1	Internet charges are unallowable for me.	Venkatesh et al. (2012); Nyirenda-Jere & Biru (2015)
	PVn2	I can't allow to have ICT device to access the internet	Fatouma, Lei & Abdoulkarim (2016); World Economic Forum, (2015a)
	PVn3	I can't allow the costs of acquiring ICT skills required for me to adopt e-government systems.	Fatouma, Lei & Abdoulkarim (2016); Nabafu & Maiga, (2012)
	PVn4	Unavailability of ICT infrastructure to access e-government services (these include computers, smartphones, tablets, personal digital assistants etc.)	World Economic Forum, (2015a); ITU (2008)
E-Government Awareness (EAn)	EAn1	I do not know what is E-Government	Shuqin et al. (2016); Al-Shboul et al. (2014)
	EAn2	Lack of outreach awareness campaigns by the government to citizens on the benefits of using e-government services.	Shuqin et al. (2016); Al-hashmi & Suresha (2013)
	EAn3	Lack of knowledge of the existence of e-government systems.	Sharma et al. (2014); Alateyah et al. (2014)

Behavioural Intention (BIn)	BIn1	I intend to use a smartphone with internet connectivity.	Almarabeh et al. (2016); Shizha & Kariwo (2011)
	Bin2	I intend to adopt e-government systems.	Poushter & Stewart (2016); ITU (2015)
	Bin3	Given the opportunity, I am willing to use e-government system.	Fakhourya & Aubertb (2015); Alateyah et al. (2014)

Appendix 8: Common Methods Bias and Factor Analysis

Harman's One-Test Results for E-Government Users

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	**% of Variance**	Cumulative %	Total	% of Variance	Cumulative %
1	8.374	**14.953**	14.953	8.374	14.953	14.953
2	5.376	9.599	24.552			
3	3.432	6.129	30.681			
4	2.896	5.171	35.852			
5	2.471	4.413	40.266			
6	2.105	3.758	44.024			
7	1.881	3.360	47.384			
8	1.702	3.039	50.423			
9	1.478	2.639	53.062			
10	1.354	2.417	55.479			
11	1.299	2.320	57.799			
12	1.275	2.277	60.076			
13	1.163	2.077	62.152			
14	1.126	2.010	64.162			
15	1.061	1.895	66.058			
16	1.034	1.847	67.905			
17	1.012	1.807	69.711			
18	.966	1.725	71.436			
19	.919	1.642	73.078			
20	.878	1.567	74.645			
21	.833	1.487	76.132			
22	.787	1.405	77.538			

23	.761	1.359	78.897			
24	.750	1.339	80.236			
25	.712	1.271	81.507			
26	.701	1.252	82.759			
27	.679	1.212	83.971			
28	.641	1.145	85.116			
29	.628	1.121	86.237			
30	.616	1.101	87.338			
31	.600	1.071	88.408			
32	.563	1.005	89.413			
33	.549	.980	90.393			
34	.527	.942	91.335			
35	.480	.856	92.191			
36	.453	.809	93.000			
37	.405	.724	93.724			
38	.397	.710	94.433			
39	.378	.674	95.108			
40	.348	.621	95.729			
41	.328	.585	96.314			
42	.323	.577	96.891			
43	.297	.529	97.420			
44	.275	.491	97.912			
45	.271	.484	98.395			
46	.251	.448	98.843			
47	.232	.415	99.258			
48	.212	.379	99.637			
49	.203	.363	100.000			
50	4.122E-015	7.361E-015	100.000			
51	4.042E-015	7.219E-015	100.000			
52	2.710E-015	4.839E-015	100.000			
53	-1.977E-015	-3.531E-015	100.000			
54	-2.366E-015	-4.225E-015	100.000			
55	-3.637E-015	-6.495E-015	100.000			
56	-8.315E-015	-1.485E-014	100.000			

Extraction Method: Principal Component Analysis.

Harman's One-Test Results for Non-users of E-Government

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.108	**32.431**	32.431	8.108	32.431	32.431
2	2.601	10.405	42.836			
3	2.006	8.023	50.859			
4	1.570	6.280	57.139			
5	1.217	4.867	62.006			
6	1.158	4.633	66.638			
7	1.046	4.183	70.821			
8	.940	3.759	74.580			
9	.862	3.446	78.026			
10	.763	3.052	81.079			
11	.656	2.626	83.704			
12	.608	2.432	86.136			
13	.549	2.198	88.334			
14	.537	2.147	90.481			
15	.449	1.794	92.275			
16	.410	1.640	93.916			
17	.380	1.522	95.438			
18	.350	1.399	96.837			
19	.309	1.235	98.072			
20	.264	1.056	99.128			
21	.218	.872	100.000			
22	3.981E-015	1.592E-014	100.000			
23	3.055E-015	1.222E-014	100.000			
24	1.182E-015	4.728E-015	100.000			
25	-2.342E-016	-9.368E-016	100.000			

Extraction Method: Principal Component Analysis.

Appendix 9: Factor Analysis

Correlation Matrix for Performance Expectancy Scale

		PE1	PE2	PE3	PE4
Correlation	PE1	1.000	.628	.483	.514
	PE2	.628	1.000	.503	.548
	PE3	.483	.503	1.000	.553
	PE4	.514	.548	.553	1.000

Determinant = 0.245

Correlation Matrix for of Effort Expectancy scale

		EE1	EE2	EE3	EE4
Correlation	EE1	1.000	.691	.279	.302
	EE2	.691	1.000	.271	.229
	EE3	.279	.271	1.000	.461
	EE4	.302	.229	.461	1.000

Determinant =0 .359

Factor Loading Matrix for of Effort Expectancy

Variable	Factor	
	1	2
EE1	.790	-.261
EE2	.767	-.328
EE4	.522	.479
EE3	.808	.408

Extraction Method: Principal Axis Factoring.

a. Attempted to extract 2 factors.

Correlation Matrix for Social Influence and Habits scale

		SIH2	SIH3
Correlation	SIH2	1.000	.729
	SIH3	.729	1.000

Determinant = 0.468

Correlation Matrix for Privacy, Security and Trust Scale

		PST1	PST2	PST3	PST4	PST7	PST8
Correlation	PST1	1.000	.696	.533	.436	.402	.412
	PST2	.696	1.000	.614	.504	.483	.514
	PST3	.533	.614	1.000	.593	.563	.533
	PST4	.436	.504	.593	1.000	.603	.593
	PST7	.402	.483	.563	.603	1.000	.614
	PST8	.412	.514	.533	.593	.614	1.000

Determinant = 0.190

Correlation Matrix for Service Quality and Information scale

		SQI4	SQI5	SQI6	SQI7
Correlation	SQI4	1.000	.481	.433	.520
	SQI5	.481	1.000	.731	.413
	SQI6	.433	.731	1.000	.401
	SQI7	.520	.413	.401	1.000

Determinant = 0.241

Correlation Matrix for e-Government Awareness scale

		EA1	EA2	EA3	EA4
Correlation	EA1	1.000	.441	.426	.242
	EA2	.441	1.000	.233	.229
	EA3	.426	.233	1.000	.246
	EA4	.242	.229	.246	1.000

Determinant = .592

Anti-image Matrices for e-Government Awareness scale

		EA1	EA2	EA3	EA4
Anti-image Correlation	EA1	.619[a]	-.370	-.349	-.094
	EA2	-.370	.659[a]	-.034	-.134
	EA3	-.349	-.034	.668[a]	-.157
	EA4	-.094	-.134	-.157	.770[a]

a. Measures of Sampling Adequacy (MSA)

Correlation Matrix for Facilitating Conditions scale

		FC2	FC3
Correlation	FC2	1.000	.617
	FC3	.617	1.000

Determinant = .619

Correlation Matrix for Behavioural Intention Scale

		BI1	BI2
Correlation	BI1	1.000	.704
	BI2	.704	1.000

Determinant = .504

Correlation Matrix for Use Behaviour (Actual Utilisation) Scale

		USE1	USE2
Correlation	USE1	1.000	.621
	USE2	.402	1.000

Determinant = 0.838

Summary of factor loadings for study constructs: e-Government Users

	FACTOR								
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
PE2	0.780								
PE1	0.744								
PE4	0.729								
PE3	0.682								
EE1		.790	-.261						
EE2		.767	-.328						
EE4		.522	.479						
EE3		.808	.408						
SIH2			.854						
SIH3			.854						
PST2				.839					
PST3				.773					
PST1				.742					
PST4				.650					
PST7				.685					
PST8				.784					

SQI5					.826				
SQI6					.781				
SQI4					.637				
SQI7					.580				
EA1						.777			
EA2						.538			
EA3						.801			
EA4						.706			
FC2							.785		
FC3							.785		
BI1								.839	
BI2								.839	
USE1									.849
USE2									.634

Correlation Matrix for Effort Expectancy scale (EEn)

		EEn1	EEn2
Correlation	EEn1	1.000	.078
	EEn2	.078	1.000

Determinant = .994

Factor Loading Matrix for of Effort Expectancy (EEn)

Variable	Factor
	1
EEn1	.278
EEn2	.278

Extraction Method: Principal Axis Factoring.
a. 1 factor extracted.

Correlation Matrix for Facilitating Conditions scale (FCn)

		FCn1	FCn2
Correlation	FCn1	1.000	.362
	FCn2	.362	1.000

a. Determinant = .869

Correlation Matrix for Privacy, Security and Trust scale (PSTn)

		PSTn1	PSTn2	PSTn3
Correlation	PSTn1	1.000	.135	.190
	PSTn2	.135	1.000	.110
	PSTn3	.190	.110	1.000

a. Determinant = .939

Anti-image Matrices for Privacy, Security and Trust scale (PSTn)

		PSTn1	PSTn2	PSTn3
Anti-image Correlation	PSTn1	.545[a]	-.117	-.178
	PSTn2	-.117	.589[a]	-.086
	PSTn3	-.178	-.086	.552[a]

a. Measures of Sampling Adequacy(MSA)

Factor Loading Matrix for of Privacy, Security, and Trust (PSTn)

	Factor
	1
PSTn1	.678
PSTn3	.787
PSTn2	.280

Extraction Method: Principal Axis Factoring.

a. 1 factor extracted. 14 iterations required.

Correlation Matrix for Price Value scale (PVn)

		PV2	FCn3	FCn4
Correlation	PVn2	1.000	.536	.478
	PV n3	.536	1.000	.580
	PVn4	.478	.580	1.000

a. Determinant = .445

Correlation Matrix for E-Government Awareness scale (EAn)

		EAn2	EAn3
Correlation	EAn2	1.000	.625
	EAn3	.625	1.000

a. Determinant = .609

Correlation Matrix for Behavioural Intention scale (BIn)

		BIn1	BIn2
Correlation	BIn1	1.000	.737
	BIn2	.737	1.000

a. Determinant = .305

Summary of factor loadings for the non-users of e-Government constructs

	FACTOR				
	[1]	[2]	[3]	[4]	[6]
FCn1	.697				
FCn2	.789				
PSTn1		.678			
PSTn3		.787			
PVn2			.666		
PVn3			.805		
PVn4			.720		
EAn2				.790	
EAn3				.790	
BIn1					.879
BIn2					.838

Appendix 10: Regression Analysis

Correlations matrix depicting association between independent variables of Use Behaviour

		BI1	FC2	FC3	SQI5	SQI6	SQI7	EA2	EA4	PST1	PST4	PST8	EE1	EE2	USE1	SIH2	SIH3	PE2
BI1	P. Corr.	1																
	Sig.(2tailed)																	
FC2	P. Corr.	-.141**	1															
	Sig.(2tailed)	.002																
FC3	P. Corr.	-.187**	.617**	1														
	Sig.(2tailed)	.000	.000															
SQI5	P. Corr.	.274**	-.117**	-.055	1													
	Sig.(2tailed)	.000	.010	.221														
SQI6	P. Corr.	.179**	-.061	.024	.731**	1												
	Sig.(2tailed)	.000	.175	.592	.000													
SQI7	P. Corr.	.156**	-.120**	-.053	.413**	.401**	1											
	Sig.(2tailed)	.001	.008	.241	.000	.000												
EA2	P. Corr.	.125**	.077	.015	.093*	.115*	.097*	1										
	Sig.(2tailed)	.005	.089	.742	.040	.011	.031											
EA4	P. Corr.	-.025	.017	-.047	.021	.055	.068	.229**	1									
	Sig.(2tailed)	.575	.716	.295	.637	.225	.136	.000										

PST1	P. Corr.	.023*	.027	-.041	.011	.055	.068	.021	.391**	1								
	Sig.(2tailed)	.040	.016	.005	.237	.125	.126	.070	.000									
PST4	P. Corr.	.025	.077	-.047*	.065	.087	.097	.119	.127	.324**	1							
	Sig.(2tailed)	.075	.091	. 042	.512	.225	.230	.560	.080	.000								
PST8	P. Corr.	.098	.017	-.057	.241	.115	.086	.101	.370**	.457*	.617**	1						
	Sig.(2tailed)	.423	.628	.212	.337	.725	.162	.213	.000	.003	.000							
EE1	P. Corr.	.129**	.059	.126**	.141**	.175**	.116*	.237**	.337**	.311**	.297**	.267**	1					
	Sig.(2tailed)	.004	.196	.005	.002	.000	.010	.000	.000	.000	.000	.000						
EE2	P. Corr.	.097*	.044	.080	.059	.021	.030	.022	.021	.337**	.311**	.143*	.691**	1				
	Sig.(2tailed)	.033	.334	.079	.195	.648	.513	.630	.648	.000	.000	.002	.000					
USE1	P. Corr.	.413**	.093*	.115*	.077	.115*	.160*	.195**	.160*	.413**	.364**	.282**	.231**	.478**	1			
	Sig.(2tailed)	.000	.040	.011	.089	.011	.012	.002	.012	.000	.001	.004	.000	.000				
SIH2	P. Corr.	.151**	.074	.018	.141**	.166**	-.054	.024	.175**	.116*	.237**	.337**	.311**	.297**	.267**	1		
	Sig.(2tailed)	.001	.103	.692	.002	.000	.237	.600	.000	.010	.000	.000	.000	.000	.000			
SIH3	P. Corr.	.133**	.121**	.038	.030	.022	.302**	.103*	.108*	.128**	.220**	.286**	.316**	.256**	.247**	.729**	1	
	Sig.(2tailed)	.003	.007	.398	.513	.630	.000	.023	.016	.005	.000	.000	.000	.000	.000	.000		
PE2	P. Corr.	.021	.059	.158**	.086	.059	.091	.061	.103	.126**	.108*	.070	.046	.047	.073	-.042	-.012	1
	Sig.(2tailed)	.637	.195	.000	.210	.201	.075	.194	.081	.010	.022	.112	.310	.301	.108	.358	.798	

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

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

N = 489

Correlation matrix depicting association between independent variables of Behavioural Intention to use e-Gov on-users)

		FCn1	FCn2	PSTn1	PSTn3	PV2	PV3	PVn4	EAn2	EAn3	BIn1	BIn2
FCn1	Pearson Correlation	1										
	Sig. (2-tailed)											
FCn2	Pearson Correlation	.362**	1									
	Sig. (2-tailed)	.000										
PSTn1	Pearson Correlation	-.271**	-.182**	1								
	Sig. (2-tailed)	.000	.004									
PSTn3	Pearson Correlation	-.250**	-.131*	.190**	1							
	Sig. (2-tailed)	.000	.040	.003								
PVn2	Pearson Correlation	.457**	.434**	-.301**	-.179**	1						
	Sig. (2-tailed)	.000	.000	.000	.005							
PVn3	Pearson Correlation	.092	.490**	-.025	-.034	.158*	1					
	Sig. (2-tailed)	.151	.000	.701	.599	.013						
PVn4	Pearson Correlation	.429**	.515**	-.231**	-.106	.478**	.263**	1				
	Sig. (2-tailed)	.000	.000	.000	.098	.000	.000					
EAn2	Pearson Correlation	.117	.224**	-.110	-.087	.175**	.350**	.257**	1			

	Sig. (2-tailed)	.066	.000	.085	.172	.006	.000	.000				
EAn3	Pearson Correlation	.133*	.302**	-.160*	-.051	.195**	.274**	.338**	.625**	1		
	Sig. (2-tailed)	.037	.000	.012	.422	.002	.000	.000	.000			
BIn1	Pearson Correlation	-.687**	-.421**	.353**	.238**	-.479**	-.029	-.482**	-.174**	-.232**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.646	.000	.006	.000		
BIn2	Pearson Correlation	-.589**	-.373**	.342**	.194**	-.501**	-.054	-.452**	-.172**	-.231**	.737**	1
	Sig. (2-tailed)	.000	.000	.000	.002	.000	.394	.000	.007	.000	.000	

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

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

N = 247

Appendix 11: Descriptive Statistics of E-Gov Systems (Used & Intended)

E-Government Systems used by Respondents (E-Gov Users)

E-Gov System Used	N	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Agricultural e-Gov services	489	2.43	.043	.947	.784	.110	.060	.220
Anti-corruption issues	489	2.33	.039	.858	.819	.110	.288	.220
Birth and death, citizenship, passport, ID, VISA services	489	3.46	.050	1.101	-.515	.110	-.747	.220
Business registration and deregistration	489	2.66	.047	1.046	.572	.110	-.740	.220
Central Government information access	489	3.27	.050	1.108	-.285	.110	-1.211	.220
Communication-related issues	489	3.73	.045	.989	-1.076	.110	.664	.220
Consumer Protection	489	2.42	.042	.926	1.035	.110	.517	.220
Customs services	489	2.81	.051	1.123	.328	.110	-1.048	.220
Driving Licence/Register vehicle/Roadworthiness	489	2.70	.048	1.070	.551	.110	-.844	.220
Education and Training services	489	3.95	.049	1.088	-.894	.110	-.111	.220
Health-related services	489	3.27	.052	1.148	-.293	.110	-1.166	.220
Labour/employment-related issues/Permits	489	3.41	.050	1.103	-.512	.110	-.918	.220

Land Issues	489	2.21	.037	.828	1.246	.110	1.764	.220
Ministerial Departments	489	3.14	.051	1.131	-.152	.110	-1.286	.220
Municipality services	489	2.71	.050	1.101	.576	.110	-.839	.220
Office of the President	489	2.35	.042	.919	1.120	.110	.823	.220
Tax Returns Filling	489	2.73	.055	1.217	.494	.110	-1.035	.220
Tenders	489	2.06	.032	.697	1.118	.110	1.385	.220
TV and postal services	489	2.36	.045	1.002	1.136	.110	.598	.220
Other e-Gov service used	489	3.93	.057	1.254	-.888	.110	-.628	.220

E-Government Systems that Respondents wish to use (Non users of E-Gov Systems)

E-Gov System intended for use	N	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Electronic application of personal documents i.e. birth certificates, ID, passport	247	4.38	.034	.541	-.349	.155	1.104	.309
Obtain information on agricultural services	247	3.26	.070	1.103	-.363	.155	-.760	.309
Obtain information on business registration and deregistration	247	2.48	.067	1.051	.642	.155	-.154	.309
Central government information access	247	2.60	.071	1.110	.484	.155	-.628	.309
File for customs services	247	2.64	.074	1.166	.477	.155	-.744	.309

Process traffic information	247	3.53	.075	1.182	-.672	.155	-.603	.309
Access online training and training services	247	3.80	.067	1.059	-.871	.155	.028	.309
Access health related information and services	247	4.17	.051	.797	-1.571	.155	1.924	.309
Labour/employment-related issues	247	4.14	.045	.714	-1.425	.155	1.174	.309
Perform online banking services	247	4.28	.044	.687	-1.344	.155	1.819	.309
Access services from ministerial departments	247	3.15	.072	1.124	-.169	.155	-1.130	.309
Payment of municipal service bills	247	3.51	.070	1.096	-.846	.155	-.250	.309
Accessing and reading policy documents online	247	2.20	.060	.945	.720	.155	.067	.309
E-tendering and e-procurement	247	2.07	.056	.883	1.043	.155	1.287	.309
TV and postal services bill payments	247	2.79	.072	1.124	.146	.155	-1.115	.309
Searching for employment-related information and application	247	3.94	.055	.870	-1.153	.155	1.286	.309