CONTEXTUAL FACTORS, USER EXPERIENCE, USAGE AND PUBLIC VALUE OF E-GOVERNMENT SERVICES IN KENYA

BY:

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DECLARATION

This PhD thesis is my original work and has not previously, in part or in it's entirely, been presented to this or any other university for the award of any degree.

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DEDICATION

I dedicate this thesis to the soul of my late Dad for instilling in me the motivation to seek knowledge since my early childhood

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LIST OF PUBLICATIONS AND CONFERENCE PAPERS

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Publications

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ABBREVIATIONS AND ACRONYMS

AMOS	:	Analysis of Moment Structures
ANT	:	Actor Network Theory
AVE	:	Average Variance Extracted
CBSEM	:	Covariance Based Structural Equation Modeling
CFA	:	Confirmatory Factor Analysis
CFI	:	Comparative Fit Index
CR	:	Critical Ratio
DOI	:	Diffusion of Technology
EDGI	:	E-government Development Index
eGEP	:	E-government Economic Project
EGUS	:	E-government Usage
EFA	:	Exploratory Factor Analysis
GoF	:	Goodness of Fit
GoK	:	Government of Kenya
GOV	:	Governance
G2C	:	Government to Citizens
HELB	:	Higher Education Loans Board
HC	:	Human Capital
HCI	:	Human Computer Interaction
ICT	:	Information and Communication Technology
ICTF	:	Information and Communication Technology Infrastructure
IS	:	Information Systems
ISO	:	International Organization Standards
IT	:	Information Technology
ITC	:	Item-Total Correlations
ITU	:	International Telecommunication Union
KNBS	:	Kenya National Bureau of Statistics
KMO	:	Kaiser Meyer-Olkin
MI	:	Modification Indices

ML	:	Maximum Likelihood
NHIF	:	National Hospital Insurance Fund
NPM	:	New Public Management
NSSF	:	National Social Security Fund
OECD	:	Organization for Economic Cooperation and Development
PCA	:	Principal Component Analysis
PNFI	:	Parsimony Normed Fit Index
PVES	:	Public Value of E-government Services
PLS-SEM	:	Partial Least Square Structural Equation Modeling
RMSEA	:	Root Mean Square Error of Approximation
SE	:	Standard Error
SEM	:	Structural Equation Modeling
SFL	:	Standard Factor Loading
SIC	:	Inter-Construct Correlations
SRMR	:	Standardized Root Mean Square Residual
TAM	:	Technology Acceptance Model
TLI	:	Tucker-Lewis Index
TOE	:	Technology Organization Environment
UoN	:	University of Nairobi
UN	:	United Nations
UTAUT	:	Unified Theory of Acceptance and Use of Technology
UX	:	User Experience

ABSTRACT

In a pursuit to provide better services to citizens, endeavors to invest in e-government services have gained impetus in many developing countries. Accordingly, there has been a necessity for effective evaluation of quality and delivery of such e-government services. At present, there are a number of metrics used to evaluate e-government services in different African countries. Nonetheless, while these evaluation approaches have offered a foundation for comparative analysis, they are far from being perfect. By focusing on public value perspective, this study offers an interesting contemporary development in evaluating e-government services as it put more emphasis on creation of "public value" as the key objective of e-government. A literature search reveals a dearth of empirical studies in the information systems conjointly with public administration fields that study e-government based on public value paradigm in developing countries. Hence, this thesis presents a comprehensive study and examination of the factors that influence the usage and public value of e-government services. To accomplish the research objective, the study uses interdisciplinary theories namely; Technology, Environment and Organization (TOE) theory, Structuration theory, Actor Network Theory (ANT) and Public Value Theory as its theoretical foundations. In addition, a mixed methods research methodology was used to conduct the study. This involved using a questionnaire survey method to collect quantitative data and semi-structured interviews for collecting qualitative data. Quantitative data was analyzed using structural equation modeling (SEM) technique that examined and validated the developed research model. SEM was also used to evaluate and refine the model relationships. Qualitative data was analyzed using theory driven thematic analysis. Findings of quantitative and qualitative strands of the study were triangulated and data analysis stage. ICT infrastructure related factors namely; e-commerce infrastructure, systems integration, availability, reliability and accessibility: Human capital factors namely; awareness, knowledge and skills, digital inclusion and establishment of incentive and reward systems and governance factors namely policy and regulatory framework, transparency, involvement of e-government users in e-government services development were identified as key factors that influence e-government usage and public value of e-government services. The thesis contributed to theory by developing a framework for evaluating the public value of e-government services in Kenya and also how the use of mixed theories could be used in e-government research. However, the thesis recommended the use of longitudinal study to provide a better understanding of contextual factors, user experience usage and public value of e-government services. The thesis also suggested for better comprehension of user experience, data collection methods such as weblogs and group interviews could be used to conduct future related studies. More so, further studies to validate the proposed revised framework were proposed.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Investments in electronic government (e-government) have become an increasingly worldwide phenomenon due to presumed inherent benefits. With diverse meaning, e-government can be defined as the deployment of information and communication technologies (ICTs) in government organizations to advance interaction amongst diverse actors including government itself, businesses and citizens in socio-economic value chains (Verdegem, Stragier, & Verleye, 2011). Investment in e-government aim at enhancing efficient public service delivery, abating corruption, promoting participatory decision making and social inclusiveness (United Nations, 2014a). However, the critical question amid all the inherent benefits associated with the deployment of ICTs in governments, the acceptance and the usage of e-government services by the citizens has been unsatisfactory and e-government outcomes have not matched the expectations of many countries (Savoldelli, Codagnone, & Misuraca, 2014; Siddiquee & Siddiquee, 2016).

Numerous studies have been conducted to examine the uptake and level of usage of e-government services especially in developed countries (Al-Hujran, Al-Debei, Chatfield, & Migdadi, 2015; Moatshe, 2014; Rokhman, 2011). The majority of these e-government studies have been grounded on technological deterministic perspective (Heeks & Bailur, 2007) and theories such as Diffusion of Innovation (DOI) Theory DOI, Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology UTAUT (Alenezi, Tarhini, & Masa'deh, 2015). A number of researchers have recognized that findings regarding the common factors in these models (e.g. perceived usefulness, perceived ease of use) provide no explicit guidance to the design and practice of e-government programs that result to increased uptake of e-government services (Hong, Chan, Thong, Chasalow, & Dhillon, 2013; Venkatesh, Thong, Chan, & Hu, 2016). Research based on technological perspective underplay that e-government usage and value may be influenced by contextual factors such as social and political given that e-government is socio-technical phenomenon (Rose, Persson, & Heeager, 2015). Further, extant literature reveals that most previous studies examining e-government services

employ approaches derived from the private sector contexts (Bannister & Connolly, 2014; Castelnovo & Riccio, 2013; Stockdale, Standing, Love, & Irani, 2008). The approaches focus on economic and technical measurement terms and they correspond to New Public Management (NPM) paradigm of public administration management (Bai, 2013; Rutgers, 2015). However, the needs and drive of why citizens use public services are distinct from those of the private sector (Cordella & Bonina, 2012). The objective of government investments deviate from those of private sector as they encompass goals that are strategic and realization of public value (Sundberg, 2016). These goals surpass economy, efficiency and effectiveness to take into account of social and political objectives for instance trust in government, sustainability and social inclusion (Bryson, Crosby, & Bloomberg, 2014).

To look beyond the narrow technical and economic focus, this study employs public value management (PVM) paradigm, first articulated by Moore (1995) to evaluate e-government services. In studying e-government public value, local contextual circumstances that impinge e-government development are considered (Bryson, Sancino, Benington, & Sørensen, 2017; Scott, DeLone, & Golden, 2015). Through the fusion of Technology-Organization-Environment theory by Tornatzky, Fleischer, and Chakrabarti (1990), Structuration theory (Giddens, 1979) and strategic triangle framework borrowed from public value theory (Moore, 2014), the study identifies contextual factors that could impact on e-government usage and how they relate to public value. Further, drawing from the literature, the study looks at the interaction between user experience on the usage and public value of e-government services.

This study was conducted in Kenya. The rationale for carrying out the study in Kenya was informed by the fact that in the last one decade, the Government of Kenya (GoK) has made tremendous efforts to offer public services to the public through Internet-based systems. Evidently, the majority of public organizations have established websites and portals used by citizens to access electronic services (e-services). United Nations (2014) report on e-government online service ranked Kenya at position three in Africa. However, the same report point out that e-government usage was low at 42.5 percent (United Nations, 2014a). Moreover, there is paucity of empirical research of e-government grounded on public

value perspectives in developing nations. Previous literature shows that various study on e-government evaluation mainly has been carried out within the context of the developed nations (Karunasena, 2012). Specific to Kenya, literature reveals that e-government research based on public value are limited to conceptual arguments while existing empirical studies fail to take into consideration how contextual factors affect the usage of e-government services and how they are valued by the public. Also, conducting the research in Kenya creates an opportunity for transferring lessons from the developed world to the developing economies and vice versa.

1.1.1 Public Value of E-government Services

Public value refers to as "the value citizens and their representatives seek with strategic outcomes and experiences of public services" (Kelly, Mulgan, & Muers, 2002; Moore, 1995). Rutgers (2015) posits that public value is the value generated by government through services, law, regulations and other actions. Latest studies have surfaced that articulate the importance of public value paradigm in comprehending e-government broader outcomes (Chatfield & AlHujran, 2007; Hui & Hayllar, 2010; Karunasena & Deng, 2012; Sivaji et al., 2014). Similar to the objectives of private sectors which the goal is to produce private value, generating public value is the objective of government agencies (Moore, 2014). Specifically, public value in the public sector can be equated to the notion of dynamic capabilities in the private sectors, which reflects organization's capacity to combine, reconfigure, build and revamp its resources and capabilities in reaction to fast dynamic environments (Cordella & Bonina, 2012).

In contrast with the concepts behind NPM movement of the 1980s, which give dominance to economic measures, public value conceives that what works is what matters, without diminishing the importance of economic measures (Benington, 2011; Rutgers, 2015). For instance, creating services that deliver public value entails that the government put together a strong capability in staff and engaging citizens in service delivery (Bryson et al., 2017). Lately, public value theory has been employed as a diagnostic instrument to assess public services by tackling the subject of how public value is produced and the capability of authorizing environment in creating public value (Bryson et al., 2014; Cordella & Bonina,

2012). Rose, Persson, and Heeager (2015) contend that IT initiatives for the public sector which involves assemblage of stakeholders could gain from embracing public value concepts during design and evaluation.

In e-government context, Cordella and Bonina (2012) posit that analysis of ICT effect on public sector ought not to exclusively center on direct economic value impact link and choices of the individual, but comparatively on the shared preferences as postulated by epitome of public value. In evaluating the public value of e-government the focus is mainly on three critical values; services, desirable outcomes and trust (Grimsley & Meehan, 2007). Service value is attained by offering of services that are of high quality (Bannister & Connolly, 2014; Kelly et al., 2002). Kearns (2004) stressed on five fundamental factors that relate to high quality services. These are importance of services provided, service availability, fulfillment of services, equality in service delivery and cost effectiveness. Grimsley and Meehan (2007) added satisfaction of user as a key determinant of generating value in services. Implying factors such as information, choice, customer service and use of services creates user satisfaction. E-government Service quality also comprises of shorter response time, improved access, cost saving for citizens and special provision for disability (Bannister & Connolly, 2014).

Desirable outcomes from e-government services include poverty reduction, reduced unemployment, low crime rates and enhanced environment (Osmani, 2014). According to Grimsley and Meehan, (2007) outcomes are the achievement of desirable end results. Trust encompasses public expectation of the achievement of positive response relative to their needs from public services (Teo et al., 2009). Three main ways depict trust of public services by citizens; the way political leaders and public organizations conduct themselves, the way state provide services and handles its economy, and the prevailing level of confidence in public organizations (Ranaweera, 2016).

1.1.2 Contextual Factors

Contextual factors refer to "the set of circumstances in which phenomena (e.g. events, processes or entities) are situated and afforded with opportunities and limitations" (Griffin, 2007). Heeks (2006) argues in e-government development, context matters significantly. According to his perspective, "there is never simple technology transfer". In other words, imitating how to implement information technology (from other governments) cannot guarantee the success of e-government (Forouzandeh Dehkordi, Ali Sarlak, Asghar Pourezzat, & Ghorbani, 2012). In this study, ICT infrastructure, human capital and governance derived from the TOE theory (Tornatzky et al., 1990) are considered as the contextual elements that may have an effect on e-government usage and are valued by the public.

Saunders and Pearlson (2009) define ICT infrastructure as "everything that supports the flow and processing of information in an organization, including hardware, liveware, software, data and network components". Ndou (2004) asserts ICT reliable infrastructure as a critical factor that determines success of e-government projects. Deficiency of a sound, reliable, and use of cost effective technological infrastructure, e-government uptake in many countries remain an unrealized dream (United Nations, 2014a). The availability of a well-developed national ICT infrastructure is critical for the advancement of e-government (Srivastava & Teo, 2010). ICT Infrastructure variables include internet access points' availability, the physical coverage of the internet and different access methods. Karunasena (2012) also averred poor ICT infrastructure lead to reduced usage and public value of e-government services.

Human capital refers to as the abilities, knowledge and skills incarnated in people (Srivastava & Teo, 2010). Das, Singh, and Joseph (2017) postulate that human capital reflects the degree to which the general public is well-informed and has achieved sufficient level of education. Normally, citizens who can read, comprehend and navigate through e-government services value them (Krishnan, Teo, & Lim, 2012). A positive link between education level and use of e-government services have been exposed by various empirical studies (e.g. Al-Hujran et al., 2015; Komba-Mlay, 2013). Therefore, to enhance

e-government usage and public value, government stakeholders must influence knowledge management initiatives, skills, strengthen and equip citizens with long life learning and education initiatives necessary to grow and sustain citizen-users of e-government services (Moatshe, 2014).

Governance refers to as those actions and systems that facilitate the exercise of authority and power by the different actors of society (Suhardi, Sofia, & Andriyanto, 2015). Governance covers the regulatory and public policy environments, political setups, economic empowerment of governments and individuals to afford acquisition and usage of e-government services (Girish, Yates, Williams, & others, 2012). Governance also deals with data protection, access to sensitive data, cyber laws and security and accountability and transparency of incumbent government (Kustec-Lipicer & Kovač, 2008). Governance provides a domain through which new structures, systems methods, and processes are delved into for supporting delivery of e-government services. Therefore, in pursuit of exploiting e-government inherent benefits, it is imperative for governments to create essential governance structures that support the aspirations of e-government services (Suhardi et al., 2015).

1.1.3 E-government Usage

Examining the differing types of e-government usage aid in appreciating the gains of e-government services available to citizens (Teo, Srivastava, & Jiang, 2008). According to Scott and Golden (2009), an extensive consideration of e-government usage is essential in order to confidently propose net benefits measure that adequately capture a wide and full range of user value of e-government services. E-government services stage models have been used to understand the public value proposition of e-government services (Al-Sebie, 2011; Chatfield & AlHujran, 2007).

Literature on e-government discipline demonstrates that several scholars and practitioners have proposed and developed diverse e-government maturity stage models. The models include; Howard‘s Three-Stage Model (Howard, 2001); Four Stage Model by Layne and Lee (2001), UN‘s Five-Stage Model and Deloitte‘s Six-Stage Model (Deloitte and Touche,

2001) among others. Despite lack of consensus on the number e-government services maturity stages, a number of researchers advocate for three stages, while others contend with four to six stages. However, the proponents of different stages agree that each higher level of stage embodies a more superior level of service as well as increased value of e-government services (Al-Sebie, 2011; Chatfield & AlHujran, 2007).

Comprehensive analysis of extant literature reveals that the relationship between different characteristics that influence e-government in regard to stages of e-government has been conferred from a theoretical perspective (Chatfield & AlHujran, 2007). Lee (2010) e-government services stage model have been utilized to understand e-government usage from citizen-centric (Al-Sebie, 2011). The model examines e-government on three types of services maturity namely; information access and interaction, transaction completion (service and financial transactions) and participation in policy making.

Information access and interaction phase viewed as the first stage involve citizens' access to information such as government policies, forms and documents published on the government websites. The stage also involves either one or two ways interactions where citizens can access published information or download forms from the websites (Das et al., 2017). Transaction phase provides a full array of services electronically in that the interaction between the citizens and government occurs actively online. In e-government development, this is the most important phase because ICT benefits that simplify transactions, minimize effort and reduce time are realized in these interactions (Andersen & Henriksen, 2006). The stage allows the public to carry out financial and/or legal transactions as well as the capacity to bid for government contracts by businesses (Al-Sebie, 2011). The third stage, participation in policy making involves citizens' engaging in policy and governance issues using advanced tools such as Web 2.0. In this stage, citizens can make use of interactive tools such as social media and web comment forms and online discussion platforms to air their views about e-government services development or participate entirely in government decision making process (United Nations, 2014).

1.1.4 User Experience

User experience (UX) is defined as "a person's perceptions and responses that result from the use or anticipated use of a product, system or service" (ISO, 2008). User experience is a result of a user's internal state, the distinctiveness of the designed system and the circumstance within which the interaction takes place (Hassenzahl & Tractinsky, 2006). A view supported by Redish and Barnum (2011), Schulze and Kromker (2010) delineate user experience as the extent of positive or negative sentiments experienced by a certain user in a particular context during and after product use and that inspires for further usage. Law, Roto, Hassenzahl, Vermeeren, and Kort (2009) describe two facets of user experience. The first facet reflects upon feelings during usage of the service and the second aspect surfaces after specific usages of the services over several periods of use. According to Nielsen and Norman (2011), user experience includes all features of interaction of end users with an organization, its products and services. Various disciplines exploit user experience mainly to describe the requirements for creating a successful event that provides users with an effective, efficient, easy, and pleasurable experience of a service or system (Redish & Barnum, 2011).

Relevant literature identifies pragmatic and hedonic qualities as key user experience measure indicators. Hassenzahl, Platz, Burmester, and Lehner (2000) initiated the concept of hedonic and pragmatic qualities to human-computer interaction (HCI) and further developed the concepts. Hedonic attributes are associated with pleasure, fun and enjoyment in the use of a product, service or a system (Hassenzahl, 2005). Pragmatic qualities correspond to usability aspects of a product or service (Jetter & Gerken, 2007). Largely, the hedonic/pragmatic framework has been well accepted in a large number of HCI research, for instance, websites (Van Schaik & Ling, 2008), online shopping (O'Brien, 2010) and measuring e-government based on public value (Sivaji et al., 2014). Prior research shows that hedonic and pragmatic attributes continually surfaced as two separate features, and both aspects have been recognized as pertinent predictors of an interactive product's overall assessment (Botha, Calteaux, Herselman, Grover, & Barnard, 2012; Schulze & Krömker, 2010). Further, aesthetic experience of a product has been identified to play an important role in acceptance of ICT products and services (Altaboli & Lin,

2011). Aesthetic experience implies that using a product such as a website should be sensually satisfying. Aesthetic attributes include measures such as visual appealing, use of color, style, and clarity (Hassenzahl, 2008; Sigwejo, 2015).

1.1.5 E-Government Services in Kenya

Reports point out that the Government of Kenya (GoK) has made considerable progress in implementing e-government services (ICT Authority, 2014; KNBS, 2014; United Nations, 2014a). The GoK has launched several government to customer (G2C) services to enhance the delivery of public services and achieve a broad range of socially desirable outcomes such as clean environment, equity and democracy as envisaged in [1]Kenya Vision 2030. Investing in Government to Citizen (G2C) services is also geared to conform to constitution requirement that stipulates that all citizen has the right to access information (Constitution, 2010). The G2C services in Kenya have been implemented in various state departments and other state-owned institutions and at national and county levels of governments. The services include legal information services, electronic passport application services, online traffic services, online tax services, rates payment services, immigration services and education services (ICT Authority, 2014).

The GoK has embarked on various e-government projects to provide these services. For instance, [2]Huduma Centres have been established in several major cities and urban areas. The Huduma centres endeavor to offer e-government services closer to citizens and under one roof. The GoK has also partnered with telecommunication service providers and financial institutions in the provision of mobile government financial related services such as payment of electricity, water and National Hospital Insurance Fund (NHIF), National Social Security Fund (NSSF) among others via mobile phone platforms and other ICT related technologies (ICT Authority, 2014). Further, to advance the usage of e-government services, the GoK has developed a National ICT Master Plan that covers e-government services domain. The aim of the master plan is to ensure that the e-government information and services provision support national effort to improve productivity, efficiency, effectiveness and governance (ICT Authority, 2014).

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[1] The Kenya Vision 2030 is "the national long-term development policy that aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment (Vision, 2007).

[2] Huduma Centres : this is a program by the Government of Kenya that provides one stop shop centres, in which Kenyans can access various public services such as driving licence renewals, duplicate identity cards and seasonal parking tickets (Ng'aru & Wafula, 2015).

According to a report by Ministry of Information and Communications (MoIC), majority of Kenyans interact actively with technology in terms of creation, adoption and enhancement of the technology (Ministry of Information and Communication, 2013). This is reflected by mobile diffusion of 80% by 2015, the figure noticeably being higher than the African average of 71%. The internet usage is also slightly higher with 69 out of every 100 populace having access to the internet (ITU, 2015). Recent statistics reveal that e-government development index (EDGI) in Kenya is 0.42 which is below the world average of 0.49, Human Capital index is at 0.52 below world average of 0.64 and telecommunication infrastructure component index at 0.18 far below world average of 0.37 (United Nations, 2016). Further, based on the United Nations maturity model, government services maturity in Kenya is at 58.62% (UN, 2014). According to this report, majority of Kenyans do not use e-government services at the highest of e-government services maturity level.

1.2 Research Problem

Worldwide evaluation of e-government services has been a central area of investigation within the information systems research community for the past two decades (Otieno & Omwenga, 2014; Sigwejo, 2015; Suhardi et al., 2015). Studies in this area have been conducted using two public administration confronting paradigms; the new public management (NPM) and public value paradigms (Bryson et al., 2014). NPM has been the dominant paradigm for evaluating e-government services. However, recently, NPM has provoked a strong backlash for focusing only on economic and technical aspects of e-government. Instead, the public value paradigm provides a clear framework for defining how e-government achieves public value as it combine operational capacity, authorizing environment, and value proposition dimensions of value (Al Rawahi, Coombs, & Doherty, 2016). Literature posits that the creation of public value through e-government is related to a numbers of factors such as; human, technological , social and political factors aligned to different value dimensions (Douglas & Meijer, 2016; Rutgers, 2015). However, the question of how these contextual factors affect the usage and the public value e-government services is largely unanswered especially in developing nations (Suhardi et al., 2015; Witesman & Walters, 2014).

Empirical studies conducted by various researchers (e.g. Grimsley & Meehan, 2007; Karkin & Janssen, 2014; Karunasena, 2012; Ogutu & Irungu, 2013; Osmani, 2014) to establish the relationship between contextual factors and the public value of e-government services depict various shortcomings. For example, in Sri Lanka, Karunasena (2012) examined the public value of e-government initiatives and found a positive association between ICT infrastructure and public value of e-government initiatives. However, he recommended for the revised framework to be retested and validated as the understanding of public value varies considerably from one country to another. Subsequently, in the United Kingdom, Osmani (2014) investigated the antecedents of the public value of e-government services and established that citizens who had used e-government services previously will in the long run re-use the services. The study used quantitative measures restricting the ability to carry out a comprehensive investigation of e-government users in relations to what they value. The study also paid attention to systems and service quality ignoring that political and organizational aspects have been identified to influence e-government usage and public value (Ziemba, Papaj, & Jadamus-Hacura, 2015). In evaluating Turkey government websites, Karkin and Janssen (2014), established that although the websites performed satisfactorily on user experience; conventional indicators such as supporting request and usability, they performed much less well on public value measures. While in Kenya, Ogutu and Irungu (2013) developed a framework to examined e-government systems. The study established that user satisfaction of e-government services was below forty percent. The study recommended for further study on how mobile technology enhanced e-government service delivery. Also, Otieno (2016) evaluated the intermediate impact of e-government, a case study of Huduma Centres in Kenya. The study found that poor ICT infrastructure, inadequate ICT skills, inadequate legal and policy framework and lack of citizen participation in e-government processes as key challenges in implementation of e-government projects. Key limitation of the study was that at the Huduma centres the citizens were not interacting directly with the systems and user experience could not be fully ascertained. Also, most of the services offered at Huduma centres were still at the first two stages of e-government models. The study recommended more studies to be conducted at the higher end of e-government models maturity continuum.

As aforementioned, a great extent of studies downplays the influence of contextual factors such as human capital and governance as well technological on the usage and the public value of e-government services. Extant literature also reveals that immense of theoretical and empirical research forming the body of knowledge on e-government evaluation mainly comes from developed nations. Further, the studies carried out to evaluate the public value of e-government services use either quantitative or qualitative empirical methodologies. To fill this knowledge lacuna, with the purpose of escalating the uptake of e-government services, this study, conducted an e-government research in Kenya, a developing nation and gathered data from citizens who are the main users of e-government services. The study used mixed methods to examine the relationship of contextual factors (ICT infrastructure, human capital and governance) and user experience on e-government usage and public value of e-government services. Specifically, the broad research question this research tried to answer was: What is the link between contextual factors (ICT infrastructure, human capital, and governance) and user experience on the relationship between e-government usage and the public value of e-government services from citizen-centric perspective?

1.3 Research Objectives

The overall objective of this research was to examine the relationship between contextual factors (ICT infrastructure, human capital, and governance), user experience on e-government usage and the public value of e-government services in Kenya. Specific objectives were as follows:

i) To examine the relationship between contextual factors (ICT infrastructure, human capital and governance) and e-government usage
ii) To examine the relationship between contextual factors (ICT infrastructure, human capital and governance) and public value of e-government services.
iii) To establish the relationship between e-government usage and public value of e-government services
iv) To establish the influence of user experience and public value of e-government services

v) To investigate the mediating effect of e-government usage on the relationship between contextual factors and public value of e-government services
vi) To establish the moderating effect of user experience on the relationship between e-government usage and the public value of e-government services

1.4 Value of the Study

The value of this study is multifaceted. Theoretically, this study contributes to the existing knowledge threefold. First, several studies evaluating e-government services have relied on the dominant paradigms of NPM and Weberian bureaucracies. The current study stepped out of the dominant paradigms to examine the position of public value in evaluating e-government services. The public value paradigm explains the "irrationalities" arising from the traditional paradigms. Second, by integrating contextual factors, e-government usage and user experience in a single model of investigating the public value of e-government services, the thesis enriches assessment of e-government services theoretical repertoire. Another significant contribution of this thesis was the amalgamation of public value theory borrowed from public management discipline with technology, organization and environment and actor network theory drawn from the information system. The research also has used structuration theory originated from sociology disciple but recently widely used in IS research.

From a practical standpoint, the study provides a reference framework to comprehend value relates to the achievement of e-government initiatives. This contributes to sound versed decision making in the public management with respect to innovative ICT-enabled services investments. It also aid policy makers to focus past efficiency achievements and savings on costs as stipulated in NPM principles and focus on public value philosophy as described in public value theory.

Finally, the study provides an insight to policy makers on mechanisms necessary to put in place to boost the uptake of e-government services and high provision of quality public service delivery that promote the living standards of citizens. Such policy mechanisms could be in the areas of ICT infrastructure, human capital, and governance. Understanding citizens' public value of e-government services could help developing nations improve e-government praxis in the subsequent phase of e-government.

1.5 Organization of the Thesis

This thesis is organized into seven chapters. The current chapter presents the research background, research problem, research objectives and an overview of the value of the study. The rest of this thesis is ordered as delineated.

Chapter Two: This chapter provides a discourse of the research requirements based on the earlier literature. The chapter commences by discussing theories underpinning the research. Next, it presents an outline of e-government definition, structures, stages and benefits followed by a discussion of public value paradigm and it's relevant to this study. Subsequent is a discussion of prior e-government public value evaluation frameworks and empirical literature of relationship of construct discerned in this research. The chapter also presents a prior conceptual framework, model, and research hypotheses.

Chapter Three: This chapter presents the research methodology. The chapter discusses the various research paradigms and approaches with the purpose of choosing an appropriate study research methodology. In discussing research methodology, a discourse of the mixed-methods research strategy is outlined stressing on the concurrent parallel mixed-methods methodology. The chapter also describes data collection methods, sampling procedures, reliability and validity tests as well as data analysis procedures for both quantitative and qualitative aspects of the study.

Chapter Four: The chapter focuses on quantitative data analysis. The chapter describes the strategy employed to examine data collected quantitatively and provides a report of the quantitative research outcomes. Specifically, the chapter commences with the presentation of descriptive data analysis which includes data preparation and screening and results of the participants' demographic information. Then, the chapter presents the procedures and findings of the measurement scales analysis and, the exploratory factor analysis (EFA) analysis for data purification and checking of cross loading of items. Lastly, the chapter presents data analyzed using confirmatory factor analysis (CFA) for measurement models and SEM to test the hypotheses.

Chapter Five: The chapter presents qualitative data analysis. The chapter commences with a presentation of demographic details of interview participants. The chapter then provides a summary of how to conduct thematic analysis. The chapter at the end presents the findings of thematic analysis formed by the use of a set of themes prior conceptual framework in chapter three.

Chapter Six: This chapter presents triangulated discourse of the results drawn from quantitative and qualitative threads of the study and supported by findings from previous studies. The chapter also presents a proposed new framework developed from triangulated results.

Chapter Seven: Chapter seven provides the summary, conclusion and recommendations of the thesis. The chapter commences with revisiting the research objective followed by a summary of the study findings. Afterward, a discussion of the contribution of the research to e-government research body of knowledge and the implications of the study on practice and policy is presented. Research limitations, suggestions for further studies direction are also presented at the end of the chapter.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews and discusses literature linked to the research area. The chapter commences with the review of theories of public value and e-government anchoring the study. Next, e-government and public value concepts are discussed in detail followed by a theoretical appraisal of existing frameworks of e-government evaluations. Various constructs linked to e-government public value namely: contextual factors (ICT infrastructure, human capital and governance), e-government usage and user experience and their relationships are then presented. Then a summary of empirical literature review and identified knowledge gap are outlined. Finally, is a presentation of a proposed research model as well as research hypotheses investigated.

2.2 Theories of Public Value and E-government

The theories a researcher relies on are determined by the problems being addressed and the context in which the problem arises (Lagsten, 2011). Towards aiding the selection process of the criteria of antecedents of the public value of e-government services, four theories underpin this study; Public Value Theory, Technology, Organization, Environment (TOE) theory, Actor Network Theory (ANT) and Structuration theory (ST).

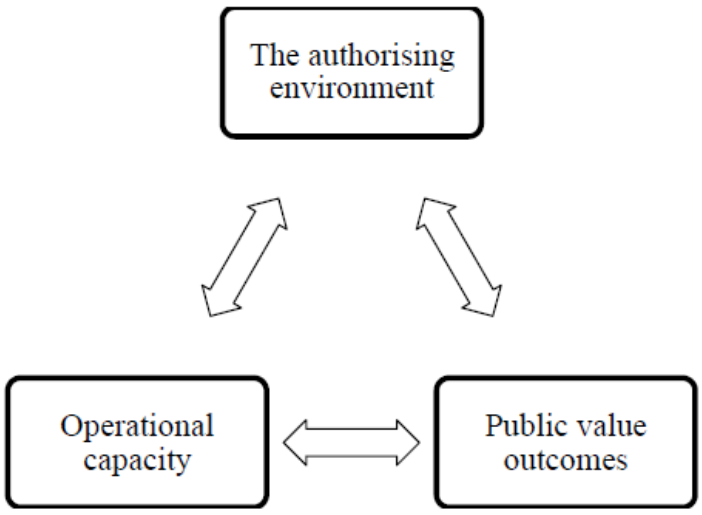
2.2.1 Public Value Theory

Public value theory can be traced from the mid-1990s drawing from seminal work of Mark Moore in the United State of America (Halligan & Moore, 2004; Moore, 1995). Borrowed from public administration, the premise of the theory is to create value for citizens (Bryson et al., 2014; Bryson et al., 2017). The theory posits that the value of citizens towards public services guides how the public sector operates in the process of delivering public services (Mimbi & Bankole, 2016). Public value theory centers on three facets namely; the government role as a producer of value, public officers' role as caretaker of public assets who have to maximize them for public value and the systems essential to these officers to guarantee services reliability and consistency (Try & Radnor, 2007). The theory posits that

works of public officers depend on what matters for the public good of citizens without shrinking the value economic measures (Benington, 2011). According to public value theory achieving public value is dependent on the relationship between government and citizens (Rose, Persson, Heeager, & Irani, 2015).

The theory through the *strategic triangle framework* conjectures that strategies in public management need to be examined concurrently from operational, substantive and political vantage points (Bannister & Connolly, 2014). The framework enlightens how processes of decision making in public sector may help in the creation of public value by interaction of three central elements; the authorizing environment (legitimacy and support), the operational capabilities and the public value outcomes" (Benington, 2011). According to Moore (2012) the three inter-related concepts influence and is influenced by the others. Public value is an outcome of the legitimate operation of public sector organization. Conversely, the kind of public value produced, at the same time; influence the operations of the organizations and the kind of legitimacy it can draw. In turn, public value produced by the organization will depend on the kind of the legitimacy it attracts (Bryson et al., 2014). Figure 2.1 depicts the public value strategic triangle.

Figure 2.1: The Strategic Triangle



Source: adapted from Benington (2011).

The theory of public value as articulated by Moore (1995) is subject to critique (Bryson et al., 2017). It is blurred whether it provides a theoretical framework, a heuristic device, a concept, a paradigm or a performance measure (Rutgers, 2015). Some scholar and practitioners argue that the theory is being employed as a rhetoric strategy to protect and advance the interests of bureaucratic and their organizations (Bannister & Connolly, 2014). Unquestionably in particular cases, the criticism has merit. For instance underscore the public value rhetoric may undermine potential democratic processes (Dahl & Soss, 2014). They warned about the ease with which the public value perspective can be hijacked for the purposes not intended by public officials. However, Smith (2004), believes that a "focus on public value enables one to bring together debates about values, institutions, systems, processes and people. It also enables one to link insights from different analytical perspectives, including public policy, policy analysis, management, economics, and political science"

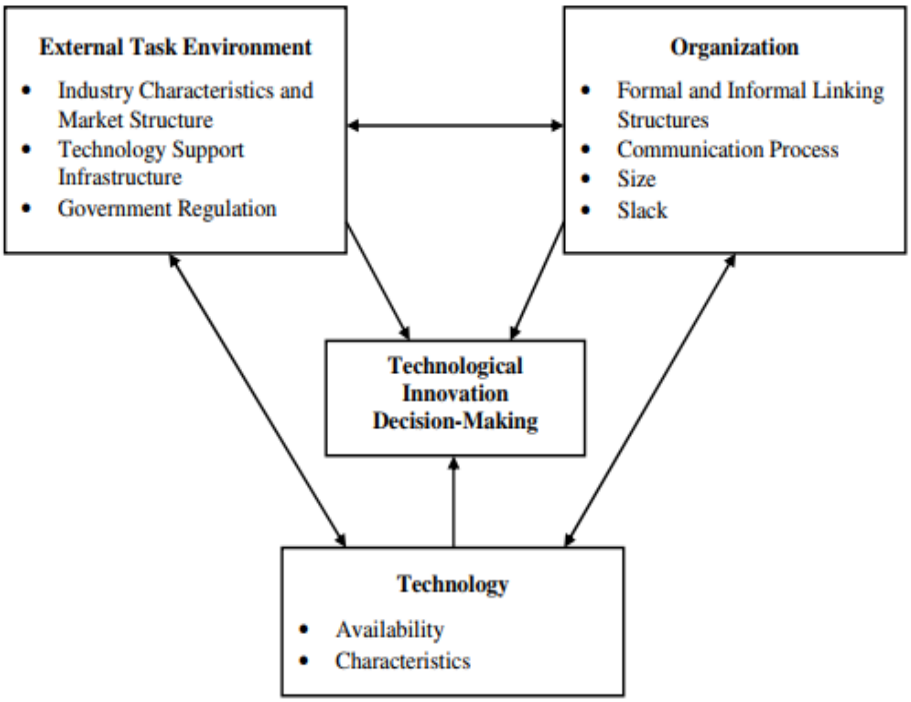
2.2.2 Technology, Organization, Environment Theory

The TOE theory is a multi-perspective framework that was proposed by Tornatzky, Fleischer, and Chakrabarti (1990). The theory embodies one fragment of innovation process that postulates three interrelated contexts namely; technology, organization, and environment. The interrelated context affects the adoption and achievement of innovations in technology (Baker, 2012). The TOE theory is an enhancement of DOI theory by Rogers (1983) by incorporating technological and environmental factors The incorporated factors present opportunities and constraints to technological innovations (Tornatzky et al., 1990).

The *technological factors* refer characteristics of the technologies existing for possible adoption by the organization, and the present state of technology such as equipment owned by the organization and new technologies available for use. The technological factors may affect the ability of the organizations or public to benefit from e-government services (Thi, Lim, & Al-Zoubi, 2014). *Organization context* defines the characteristics and resources of the firm. For example, organization structure, size, managerial structure and communication and resource processes (Zhu & Kraemer, 2005). *Environment context* describes the environmental conditions for instance regulatory framework, the external support accessible for accepting latest technologies and government rules. In summary

technology, organization and environment contexts present "both constraints and opportunities for technological innovation" (Tornatzky & Fleischer, 1990). Figure 2.2 exhibits the TOE framework by Tornatzky and Fleischer (1990).

Figure 2.2: The Technology-Organization-Environment Theoretical Framework



Extant literature demonstrates that TOE theory has extensive applicability and provides an explanatory power that transverse numerous technological, industrial, cultural and national contexts (Barker, 2011). Researchers in IS has utilized the TOE theory in different empirical setting and research contexts, such as e-procurement (Mishra, Konana, & Barua, 2007), usage and value of e-business (Zhu & Kraemer, 2005). IS success among manufacturing SMEs (Ghobakhloo & Tang, 2015). While the TOE theory has been widely used in a number of contexts, it has not been used extensively in the domain of e-government. Nevertheless, Srivastava and Teo, (2010) and (Pudjianto, Zo, Ciganek, & Rho, (2011) are two studies in the IS literature that have utilized TOE theory in the domain of e-government. As abovementioned, the TOE theory provides an explanation and identifies factors that influence technological innovations which may differ slightly in respect to contexts (Barker, 2011). In e-government related factors such as ICT

infrastructure, human skills and knowledge and governance mechanisms have been explained through the TOE context respectively (Srivastava & Teo, 2010). The rationale for utilizing the TOE theory in this study is the theory provides three categories of factors that a single context might not present, hence providing a greater explanatory power for understanding the usage and public value of e-government services.

Nonetheless, in spite of TOE theory usefulness in investigating a wide spectrum of innovations and contexts, the theory has some critiques who view the theory as "still more than a nomenclature for classifying variables, and does not embody a well-developed theory or an integrated conceptual framework and is described as a generic theory (Mishra et al., 2007). The framework of the theory comprises a high-level theoretical foundation for examining the taking up of technology. The factors recognized within the three contexts may be different across diverse studies and offers no theoretical grounds indispensable for determining causal relationships (Mishra et al., 2007). In essence, the TOE framework should be combined with other theories to provide a comprehensive framework and able to establish the causal relationships needed for hypothesis development (Barker, 2011). This study enriches the TOE theory by coalescing it with the citizen-centric perspective engagement and e-government literature.

Drawing from extensive review of literature (e.g. Krishnan et al., 2012; Siau & Long, 2009; Srivastava & Teo, 2010), this study identified three factors that might affect e-government usage and public value namely ICT infrastructure, human capital and governance corresponding to the three contexts in the TOE theory. ICT infrastructure from user perspective refers to the reliability, availability and accessibility (Karunasena & Deng, 2012; Reddick & Turner, 2012). Human Capital consists of abilities, knowledge and skills embodied in citizens (Sinjeri, Vrcek, & Bubas, 2010). Governance refers to as the institutional and actions that facilitates the exercise of authorities and power by different actors of society (Suhardi et al., 2015). Table 2.1 shows the TOE contexts, corresponding constructs and its definitions.

Table 2.1: Context, Corresponding Construct and it Definitions

Context	Corresponding Construct	Definition	Reference from the IS literature
Technology	ICT infrastructure	ICT infrastructure from user perspective refers to the reliability, availability and accessibility	Srivastava and Teo (2010), lsheikh, (2012), and Pudjianto et al., (2011), Sinjeri et al. (2010)
Organization	Human Capital	Consists of abilities, knowledge and skills embodied in citizens	Siau and Long (2009), Sinjeri et al. (2010), Krishnan, Teo and Lim (2013)
Environment	Governance	Governance refers to as the institutional and actions that facilitates the exercise of authorities and power by different actors of society	Elsheikh, (2012), Madon et al. (2007), Krishnan, Teo and Lim (2013)

2.2.3 Actor Network Theory

The seminal works of Callon, Law, and Rip (1986); Latour (1987, 2005) and Law (1999), are recognized as foundations of Actor Network Theory (ANT). As its primary advocators maintain, ANT is exclusively suitable for socio-technical research (Callon,1986). The fundamental tenet of ANT comprises both human beings and non-human objects regarded as actors (Thapa, 2011). Non-actor elements in e-government context could include elements such as technology, policies and government services (Twum-Darko, Noruwana, & Sewchurran, 2015). Actor Network Theory advocates that the world comprises of intertwining networks which are made up of many intricate relations that regularly reconfigure itself on regularly to achieve a specific objective (Carroll, Richardson, & Whelan, 2012). In other words, ANT presents the ability to unearth the series of influences or actions from different actors which are performed to produce a particular action or result. One important aspect of ANT is the denial of a *priori* dichotomy between the social and the technical networks; they are considered to be intertwined in what (Law, 1999) referred to as heterogeneous networks. According to Latour (2005), in ANT, both people and technologies can act and be acted upon.

Actor Network Theory views the world as being made of a network of connected elements without social order. The networks are created through "mechanics of power" referred to as sociology of translation (Twum-Darko et al., 2015). Translation is a process or

mechanism by which actors relate to change networks or assemble so that particular actors are able to have power over others (Heeks & Stanforth, 2007). The translation comprises of four moments; namely; *problematisation, Interresement, enrolment, and mobilization* (Latour, 2005). The *problematisation* is where focal actor by presenting the problem to other actors establishes an obligatory passage point (OPP) between actors and networks with the goal of framing itself indispensable. *Interresement* is where association emerges after other actors accept and agree on the definition of the focal actor. During interresement, the focal actor endeavors to lock the others actors by attempting to get them persuaded regarding its definitions and then intervening their particulars of involvement (Latour, 2005). In enrolment, the other actors take the roles and their interest endorsed by the focal actor through the process of concession and bargaining (Gunawong & Gao, 2010). *Mobilization* is the final moment of translation where the focal actor acts as a spokespersons or representatives of the other actors to ensure that other actors' interests are taken care of to circumvent deceit from the latter (Callon et al., 1986).

Conceptually, the ANT approach can be valuable in helping researchers to appreciate the complexity and fluidity of reality, which may be neglected by research approaches assuming a more linear and casual approach to studying information systems implementation (Bhaskar, Collier, Lawson, & Norrie, 1998). In e-government research it allows the research effort to revolve around actors within e-government and provides an insight of the dynamic that is used by actors to arrive at decisions they make (Cordella & Hesse, 2015). Actor-network theory brings into the picture the diverse artifacts that they assemble around themselves and permits the research to expound into these, and their associations to fabricate a fascinating image of how the processes unfold. A fundamental question tackled by ANT is which associations are stronger than the rest, implying that a phase of immovability during which actors co-evolve can happen (Heeks & Stanforth, 2007). A phase like that typically occurs once a process of translation is over such that actors are induced by one actor to align their interests towards an established network. Referring to technological artifacts, is understood through diverse factors such as relationships, uses, beliefs and assumption embodied through the process of inscription (Carroll et al., 2012). Extant literature posits that the dynamic of multifaceted,

socio-technical processes such as e-government evaluation can be better comprehended through ANT (Sundberg, 2016). Through ANT concepts researchers are able to comprehend the politics of the social-technical process. In this research, ANT concepts of translation and inscription have been applied to understand how value is realized through e-government services. Tatnall (2005) puts forward that ANT offers an appropriate lens to comprehend user requirements in IS development and technology innovations.

Critiques argue ANT has inadequacy in researching social structures between levels of analysis. The ANT disregards the broader social structure by focusing on actors and their actions as they performed in a particular time and place. In other words, the ANT has limitations of studying social structures between levels of analysis. However, Latour's (1993, p. 119) combats this criticism when he states that: *"the macro-structure of society is made up of the same stuff as the micro-structure".* Also, ANT has been criticized as being too descriptive and not coming up with any comprehensive suggestions of how actors are supposed to be seen, and their actions analyzed and interpreted (Cordella, 2010). To deal with limitation of ANT, Walsham (1997) suggests that "*one approach for IS researchers is to combine the methodological approach and conceptual ideas of Actor-Network Theory with insights and analysis drawn from theories of social structures"* (p. 473).

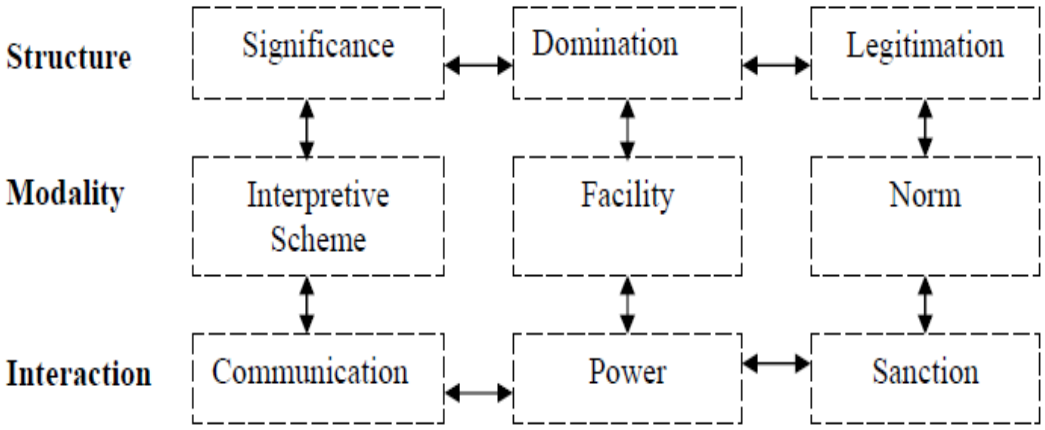
2.2.2 Structuration Theory

Structuration theory was conceptualized in 1984 by Anthony Giddens, a British sociologist to understand the duality of structure (Giddens, 1984). The duality of structure refers to the notion that the social systems structure or institutional properties are created by human action, and subsequently serves to form auxiliary human action (Jones & Karsten, 2008). Structuration theory philosophical frames stand on social phenomenon formed by both structure and human agents. The theory embodies a response to apparent weaknesses of the main thought of sociology school and creates human society ontology. Giddens disparage the "naturalist" approaches (for instance functionalism, structuralism and post-structuralism) for downplaying the significance of human agency and ascribing needs purposes and reasons to society instead of individuals. Structuration theory posits that

human activities and the social structure shape social phenomena (Bwalya & Mutula, 2016). Structuration theory premises that social reality is constituted by both subjective human actors and by institutional properties.

Three notions are fundamental to Giddens' exertion: " duality of structure, actor's knowledgeability, and time-space relations"(Hond, Boersma, Heres, Kroes, & van Oirschot, 2012). Structure duality indicates that the agency and structure are jointly constitutive. The social structure is replicated by enduring human action, whereas, all together, the structure makes possible and restrains human action (Giddens, 1979). In Giddens' perspective, phenomena are shaped voluntarily by actors, implying that they are well-informed regarding their actions. Time-space reflects the view that social actions are located in a specific time and space and they cannot be simply detached from their setting and positioned into another circumstance (Hond et al., 2012). Further, drawing from previous work of, Marx, Weber and Durkheim on coding, resource allocation and authorization, and normative regulation, Giddens pointed out "significance, domination and legitimation" as the three dimensions of the duality of structure. Signification structures embody the rules of organization that inform and define interaction. Domination structures represent the reality that all social systems are marked by authoritative asymmetry and allocated resources. Legitimation structures are constituted by organizational norms or what is acceptable or appropriate without use of power (De & Ratan, 2009). Giddens identified that the dividing structure duality into the three dimensions is purely an analytical device; as in reality, they are inextricably interlinked. Figure 2.3 shows connections of the duality of structure.

Figure 2.3: Duality of Structure



Source: Adapted from Veenstra, Melin, and Axelsson (2014)

In the dimension of structures, three linking modalities link the three structures (Veenstra et al., 2014). Consequently, as human actors communicate, to help make a sense of interaction, interpretive schemes are activated; simultaneously, those interactions replicate and modify interpretative schemes embedded in the social structure as signification or meaning. At the same time, the facility to allocate resources is ratified in the exercising of power, generate and regenerate domination social structures.

Structuration theory has been expansively been applied in IS research in developing countries (Jones & Karsten, 2008). The theory serves as a valuable theoretical framework that can aid comprehend the association between technologies and the people who interprete them (Veenstra et al., 2014). Structuration theory has been considered particularly valuable for elucidating IS implementation and unanticipated outcomes (Meneklis & Douligeris, 2010). According to Orlikowski (1992), the concept of structures from structuration theory aids in explaining how actions can develop into "relatively stable and represent system-like patterns of interactions over time and space". In the IS arena, the concept of structures has been applied to discern the IT-organization link as reciprocally shaping and being shaped. In particular, in IS literature, to balance technological determinism views and social shaping of technology perspectives, the duality of technology is the most used form of structuration (Jones & Karsten, 2008).

Giddens' structuration theory identifies the relations between the most "micro" facets of society (such as individuals' internal sense of self and identity) and the "macro" picture of the state. Traditionally these different levels have been dealt with independently by sociology. However, according to Giddens' the two levels cannot be comprehended in seclusion as each influence the other. The eradication of artificial partitioning of research concentration between macro and micro levels of analysis is one of the main strength of struturation theory as structuration process operates at multiple levels of analysis. In this research, this concept is very useful in understanding what influence the way citizens value e-government services; it requires analysis of both national and local levels context. The factors that may influence the value of e-government services at the local level also intertwined to those factors at the national level. Furthermore, in e-government context, structuration can be viewed as relating three broad entities: technology, government, and citizens (Heinze & Hu, 2005).

Although structuration theory has been adopted in developing research framework to help in understanding various research phenomena, the theory has been criticized for: 1) arguing that structures do not exist separately of human agency. Opponent questions the observation that social order is constructed and reconstructed exclusively through individual actions. Storper (1985) claims that "the dualism of the material, although not imposing absolute constraints on system change, does mean that at any moment not everything is possible". Similarly, Barbalet (1987) censures the supposition that existence of material cannot be social structural resources in power relations. 2) The theory has been criticized for operating at too high level of generality to offer direction in particular empirical scenery. Structuration theory instead of offering an empirically testable explanation of social behaviors offers an approach of thinking about the world (Jones, 1998).

2.3 Overview of E-Government

Different facets of life, including the economic, social and the association between citizens and their government has been impacted by the proliferation of ICT. Such development has stemmed in a new form of government branded as e-government (Kanaan, 2009). The following section provides the diverse definition of e-government along with the structures, stages and e-government benefits.

2.3.1 Definition of E-government

There is no universality accepted meaning of the term e-government and the existing definitions of e-government differ across the world (Al-Rashidi, 2013). Any provided explanation of term e-government owes to the variance of e-government perspectives such as commercial, administrative, social, technical and legal (Bwalya, Zulu, Grand, & Sebina, 2012). Extant e-government literature reveals that authors attempt to delineate e-government drawing from their own viewpoints. Nonetheless, of consensus is that e-government offers information and services by applying ICT to citizens, organizations, and employees (Palvia & Sharma, 2007; Weerakkody, Irani, Lee, Osman, & Hindi, 2015).

West (2001) refers to e-government as online delivery of information and services via the Internet. Basu (2004) added, "e-government services entails delivering of government services via the Internet, telephone, community centres (self-service or facilitated by others), wireless devices or other communication systems". Other definitions stress the importance of e-government in escalating the participation of citizens in the democratic process. For instance, Carbo and Williams (2004) define e-government as "the use of information technologies particularly the Internet to provide government information and services and engage the public in online government decision making and democratic process in a much more convenient, cost-effective, citizen-centric oriented and potentially different and better manner". Coursey and Norris (2008) delineate e-government as employing ICT to make available government information and services to all sectors of the society. Similarly, World Bank (2009) defines e-government as using electronic systems to enhance and improve the communication and collaboration between governments and citizens, private sectors, employees and other government agencies. Lately, Srivastava (2011) refers e-government as applying of ICTs, the Internet and web-based applications to government improvement, as well as better delivery and access of all government services to stakeholders.

This research adopts the e-government definition put forward by the United Nations (2014) that defines e-government as the *"use of ICT and its application by the government for the provision of information and public services to the people. The aim of e-government, therefore, is to provide efficient government management of information to the citizen; better service delivery to citizens; and empowerment of the people through access to information and participation in public policy decision-making".*

This definition takes into account the aspect of citizen-centric focus and e-government benefits. Further, the definition covers the emerging concept of open government with its characteristics of e-participation and citizen empowerment.

2.3.2 Types of E-government Services

Electronic government offers services electronically to different stakeholders, namely citizens, employees, business sectors and government organizations. These services differ according to users' requirements, and this diversity has given rise to different structures or types of e-government services. Wang and Liao (2008) categorized e-government into four nomenclature in connection to government and the recipient of its electronic services: the categories include; Government to Citizens (G2C), Government to Government (G2G), Government to Businesses (G2B) and Government to Employees (G2E).

Government to Citizens (G2C) describes the citizens and government interactions via the Internet. Through G2C citizens access government information and services in a simple, efficient and effective way. G2C include electronic services such as renewing of passport or paying of fines (Osman et al., 2014). G2C also enables participation of public through discussion platforms such as government websites and social media. Government to Government (G2G) describes the interaction between government organizations with one another at different levels. G2G is inevitable when government's goal is to provide services to businesses and citizens from a single access point which requires cooperation and collaboration among government departments and agencies. In addition, G2G e-government entails data exchange and communication between different levels of governments and foreign government organizations. Government to Businesses (G2B)

depicts the interface connecting businesses and government through presenting interactive services via the web and the internet to assist different businesses. For instance, through G2B businesses complete particular transactions with government agencies and may also access and receive government information online (Siddiquee & Siddiquee, 2016). Lastly, Government to Employees (G2E) depicts the association between government and employees in a more efficient manner by helping employees to access a variety of benefits on-line and improve their productivity.

As stated in section 1.1.5, this research evaluates e-government from the citizens' viewpoint. Hence, the study focuses, presents and examines the literature pertinent to G2C e-government services. Extant literature discloses that a bulk of e-government services comes from G2C category and indeed is the primary goal of e-government (Chen, Chen, Huang, & Ching, 2006). The G2C form of e-government endeavors to enhance citizens' access public information by utilizing tools such as government websites and portals and other channels such as mobile phones. Government-to-citizen provides and delivers apt support for the citizens anytime and anywhere through facilitating them access or execute online transactions or activities such as searching for contracts details of public departments and applying employment online (Wirtz & Daiser, 2015). Further, G2C empowers and permits citizens to contribute and participate in decision making processes on issues that concern via the Internet. Hence, G2C add values or improves the quality of citizens' lives through provision of quality government services.

2.3.3 Stages of E-government Services

Due to continued advancement in online service delivery in public sectors worldwide, several e-government initiatives reflecting stages of e-government have been put in place by many countries to enhance public services. The e-government stages or phases have been used by researchers as a yardstick or benchmarking tools for evaluating e-government services (Chatfield & AlHujran, 2007; Krishnan, Teo, & Lim, 2013).

There are different recognized frameworks that depict maturity stages of e-government (e.g. Layne & Lee, 2001; Lee, 2010; Rashid, 2012; Shareef, Jahankhani, & Dastbaz, 2012). The existence of numerous numbers of these models demonstrates a lack of a collectively accepted framework for e-government development (Maumbe, Owei, & Alexander, 2008). The models also depict diverse taxonomy and characteristics. The existing e-government maturity models comprise between stages ranging from three to six and a service can be classified as to belong to a different stage in different models. For example, in Layne and Lee model (2001) model, e-payment appears in stage two but in Moon model in the third stage (Treiblmaier et al. 2004). The differences may partly be caused by in the conceptual definitions. Differences has also been noticed within the same organization categorization; for example, the United Nations classified "emerging presence" and "enhanced presence" independently in 2001, join them into one stage between 2003-2008 but in 2012 separated them once again, with a subtle name change to "emerging information services" and "enhanced information services".

Despite the existence of different e-government maturity stages and each model comprising its own nomenclature of levels, all possess certain similarities. All models concur the complexity of the technology deployed is directly proportional to the stages of e-government services (Al-Sebie, 2011). The majority of maturity models stages starts with offering elementary online information and end with online services that are fully integrated (Andersen & Henriksen, 2006). In the e-government context researchers apply maturational models for categorizing activities and forecasting possible outcomes (Das et al., 2017; Krishnan et al., 2013; Rashid, 2012; Shareef et al., 2011). Maturity models are also applied as a guide for evaluating and improving e-government (Wirtz & Daiser, 2015). In evaluating e-government, early stages of maturation are linked to only small service gains, while a higher level of maturity indicates higher benefits (Al-Sebie, 2011). Therefore, e-government services stages are utilized as a surrogate for comprehending the gains of e-government (Chatfield & AlHujran, 2007).

According to Esteves and Joseph (2008), various existing studies focusing on e-government services stages are inclined towards technical factors often omitting the human and organizational factors. Despite these factors considered to have an effect in the diffusion, acceptance, and adoption of e-government services. Notably, only a few of these maturity models embrace technological, organizational, user and service perspectives collectively. The stage model proposed by Lee (2010) has been one of such models. Through combining different perspectives, Lee model identifies four metaphors on two visibly distinguished themes of "users and services perspective" and "operations and technology perspective" themes. The metaphor of *presenting* "does not contain detached themes since it represents a simple information presentation". However other metaphors namely *assimilation* (stage of interaction), *reforming* (stages of transaction) and *morphing* (stages of participation) contain clearly differentiated themes (Lee 2010). This study utilizes Lee's Model to appreciate the usage and value e-government services by the public as it incorporates citizen-centric perspective of e-government.

2.3.4 Benefits of E-government Services

Investments in e-government offer enormous benefits to government and other diverse stakeholders for example employees, citizens, businesses and government agencies that interact with the government (Rokhman, 2011). E-government services benefit commonly fall under economic, social and political themes (Dwivedi, Weerakkody, & Janssen, 2012).

From an economic perspective e-government implementation promises both tangible and intangible benefits. The tangible benefits encompass lessening of costs for target users and government itself. For instance, self-service through online government services can significantly reduce costs for both parties. In term of indirect benefits, the e-government implementation can shorten the process of delivery of services, reduce bureaucratic intricacies and enhance government accountability (United Nations, 2014b). Social benefits include empowers citizens through access to online information (Weerakkody et al., 2015). For example, through e-government, citizens across the country can access information surmounting geographical restrictions, social and cultural barriers. Thus, people in remote areas can access same e-government services like those in urban cities.

Finally, the political benefits of e-government are that e-government has the capacity to foster good governance by increase public participation in political processes, enhance transparency and build trust between citizens and government (United Nations, 2014a; Weerakkody et al., 2015)

The benefits of e-government to the public should be exploited to hearten citizen uptake of e-government services. As people prefer inertia and inherently resistant to change governments are required to provide incentives for using e-government services. In this respect, e-government services have some unique characteristics, which need to be considered in research and practice to increase usage of e-government services. For instance, extant literature postulates that government should allocate resources, create policies and offer services in citizens' best interest (Jorgensen & Bozeman, 2007). The government should provide equal access to the entire population including poor citizens, disabled, elderly and less computer literature, which are deprived of Internet access (Bharosa, Feenstra, Gortmaker, Klievink, & Janssen, 2008).

2.3.5 E-government in Developed and Developing Countries

Extant literature reveals well endowed economically nations have outshined developing countries in terms of online services they provide to their people (Khoury, Junkunc, & Mingo, 2015). In contraposition developing nations are struggling with e-government development, and many of these nations have not gained from e-government investments (Heeks, 2005). United Nations e-government survey (UN, 2014) report demonstrates a huge variation in the percentage of citizens of developing and developed nations using e-government services. For instance, while less than 20% of citizens in developing countries use e-government services, more than 80% of citizens in the Nordic countries make use of e-government services. Differing reasons have been put forward explaining why most of the developing nations are a distant behind in respect to using of e-government services.

Siddiquee and Siddiquee (2016) for instance, claim that unwarranted systems development costs, unstable supply of power, poor rural electricity connectivity and other resource issues continue to confront developing nations. In numerous occasions, these impediments put off the establishment of even the rudimentary, timely and significant web presence.

Besides of lack of adequate public ICT infrastructure on which e-government run on, developing nations suffers from dearth of adequate knowledge and skills to build up appropriate strategies for setting up and supporting e-government (Khoury et al., 2015). Low degree of e-government services maturity in developing nations has also contributed to fewer e-government services acceptance in developing nations (UN, 2014). Table 2.2 summarizes the comparison between e-government in developed and developing nations

Table 2.2: E-government Comparisons: Developed Vs Developing Nations

Technical Staff	Consist of present staff requires to add technical capabilities and recruit younger professionals Possess financial resources to outsource and has outsourcing capability Available staff able to delineate needs for development	Lack staff, or has very few in-house staff Lack financial capability to outsource and local outsourcing abilities Available staff may be incapable of defining specific needs
Infrastructure	Excellent current infrastructure Internet access high for citizens and employees	Poor current infrastructure Internet access low for Citizens and employees
Citizens	High Internet access and ICT literacy; digital divide problem still exist and are also concerned about privacy issues Comparatively more knowledgeable in democratic systems and more active in participation in policy-making process of government	Low Internet access and citizens are hesitant to trust online services; few citizens have computer skills Comparatively less knowledgeable in democratic systems and less actively participate in policy-making process of government
Government Officers	Good computer literacy and dedication of resources; many do not place e-government as a high priority	Computer literacy low and due to lack of knowledge. majority do not place e-government at a high priority

*Source***:** Diaz, Cruz, Candia, and Usman (2015)

Scholars have stressed that for developing nations to deliver government transformation through e-government, the focus should be on the interaction between technical, financial, social and managerial factors (Brown & Thompson, 2011). Others are advocating for a context-oriented approach as a more promising direction for e-government research (Schuppan, 2009). Nations including Senegal, South Africa, Mozambique, and Mauritius have already portrayed serious dedication by placing sound regulatory policy and institutional frameworks for e-government development (Bwalya & Healy, 2010).

2.4 Public Value Paradigm

Among public policy makers in both developed and developing nations, the concept of public value has attracted a lot of interest (Benington, 2011). Undeniably, public value has turned to be a leading field of research within the extensive public management discipline (Rutgers, 2015). The conception of public value was advanced by US scholar Mark Moore, in his seminal book "*Creating Public Value: Strategic Management"* (1995). Subsequently, several authors have sought to define, classify and distinguish the salient characteristics of public value (e.g. Alford & O'Flynn, 2009; Bryson et al., 2014; Meynhardt & Bartholomes, 2011; Sorensen et al., 2016).

Public value refers "to the value which citizens and their representatives seek in relation to strategic outcomes and experiences of public services" (Moore, 1995). It comprises the value connected to the comparatively tangible outcomes, such as universal access to health care and reduced homelessness, and to the more vague outcomes like increased trust in government (Grimsley & Meehan, 2007). Stoker (2006) expresses public value as more than summing up of individual preferences of the producers or users of public services, but as collectively built through deliberation embracing appointed and elected officials and chief stakeholders. Further, Heeks (2006) delineates public value as the value produced by government through services, laws, regulation and other actions. Public value also reflects a multidimensional construct consisting of a manifestation of jointly articulated, politically mediated inclinations that are citizenry consumed and produced not through 'outcomes' but also through processes which may create trust or equality (O'Flynn, 2007). Borrowing from psychological research and value philosophy on rudimentary human needs, Meynhardt (2009) develops a non-normative public value theory centering on value content. The definition links public value creation to the perceived fulfillment of basic human needs. He arrives at the subsequent definition:

> *"Public value is value for the public. Value for the public is a result of evaluations about how basic needs of individuals, groups and the society as a whole are influenced in relationships involving the public. Public value then is also value from the public, i.e. 'drawn' from the experience of the public. [. . .] Any impact on shared experience about the quality of the relationship between the individual and society can be described as public value creation". (p. 212).*

In exploring the meaning of public value, Jorgensen and Bozeman (2007) find this concept associated with seven identified value categories. These include public sector's contribution to society, transformation of interests to decisions, association between public administration and citizens, public sector employees behavior, and the citizens, transformation of interests to decisions, association between administrators and politicians and intra-organization aspects of public administration. Public value provides an extensive method of assessing performance of government and providing direction for policy decisions (Bryson et al., 2017). Benington (2009) conceives of public value in four main dimensions: economic, political, ecological and social and cultural values. He discusses how each value adds to the public realm. For example, economic value generates economic activity while political values stimulate and support active participation and citizen engagement, ecological value actively promotes sustainable development and social and cultural value contribute to social relationship, social capital, cultural identity and community and individual well-being.

The rise of public value may be attributed to the need to address the limitations and advance NPM concepts (Bryson et al., 2014). NPM concepts take a market-oriented approach which focuses on stricter management techniques and economic models drawn from the private sector (Meynhardt, 2012; O'Flynn, 2007). Rutgers (2015) contends that public executives apart from focusing on the market process need also to balance the social, technical and political interests. Basically, public value theory approaches capture institutional responsiveness to the polished preference of the public that goes beyond efficiency and productivity targets. These include "non-mission-based values," for instance, fairness, freedom of information, due process, and citizenship improvement. In the private sector, the theory of public value can be equated to the theory of dynamic capabilities, which relates to an organization's aptitude to amalgamate, assemble, reconfigure and renew its resources and capabilities in reply to fast changing environments (Bryson et al., 2014). Table 2.3 provides a comparison between NPM and Public Value Paradigms.

Table 2.3: Comparison between NPM and Public Value Paradigms

	New Public Management	Public Value Management
Public interest	individual preferences aggregation, exhibited by the preference of the customer	public preferences and individual (ensuing from public consideration)
Key objectives	Inputs and outputs management to guarantees economy and consumers responsiveness	Multiple objectives; Create public value in reference to service outputs, outcomes, satisfaction, upholding trust/legitimacy
Dominant model of accountability	Upwards through performance contracts; sometimes outwards customer market mechanisms	Multifaceted, as public officer should focus on law, professional standards, society values, political norms, and interests of citizens
Methods for accomplishing policy objectives	Establishes incentives and mechanisms structures to attain policy goals mainly by applying of markets	Choice from a list of options of different delivery means drawn from pragmatic standard; this aims at cross-sector engaging and collaborations of citizens to realize objectives that have been approved
Key values	Efficiency and effectiveness	Efficiency, effectiveness, and the packed array of constitutional and democratic values
Approached to public service ethos	Cynical of ethos of public sector (lead to inefficiency) – favors customer services	No single sector has a monopoly on ethos, and no single ethos constantly suitable. As a valuable resource, it requires to be cautiously managed.
Responsibility for public participation	Limited – sometimes customer satisfaction surveys used/	critical – multi-faceted (customer, citizens, key stakeholders)
Aim of managers	Meet established performance targets	React to citizens/user preferences, renew mandate and trust guaranteeing quality services
Role of citizens	Citizen viewed as customer	Citizens view as co-creators and problem-solvers actively involved in creating what is good for the public and what is valued by public

Sources: Adapted principally from Bryson, Crosby, and Bloomberg (2014) with further adaptations from Kelly, Mulgan, and Muers (2002)

Despite the existing literature portraying the public value as a fuzzy concept, three core themes can be deduced from the literature. First, public value is a measurement tool for public services performance. Second, public value is co-production of governments and society; and thirdly public value needs the development of public services to take account of political and democratic values. Therefore, Public value forms a foundation for creating a balance of benefits across all stakeholders, and through public value the meaning of e-government quality, performance and success is comprehended (O'Flynn, 2007). Moore (2014) affirms that employing public value theory to study e-government aid researchers in comprehending the degree to which electronic services deliver a balanced portfolio of benefits viewed by various stakeholders as importance.

In realizing the public value from public services, government officers who are the key arbiter of public value need to focus on three fundamental areas; quality of public services, socially desirable outcomes and trust (Moore, 2005). Realizing the public value based on this model has gained acceptance in both public sectors (Alford & O'Flynn, 2009; Cordella & Willcocks, 2010; Jorgensen & Bozeman, 2007) and academics (Karkin & Janssen, 2014; Osmani, 2014; Sivaji et al., 2014). Services may be acknowledged as meeting a moderately lasting need and are alike to the private sector (Rose, Persson, & Heeager, 2015). Successful service delivery, under public value theory, ropes all components of public value creation, that is, outcomes, services, and trust (Try & Radnor, 2007).

Outcomes are comprehended from targets for they are well broadly delineated. As such, they are less prone to machination or distortion in respect of accomplishment (Grimsley & Meehan, 2007, Kelly et al., 2002). Examples of outcomes include high employment and environmental sustainability. Outcomes focus on the overall benefits to society, that is, outcome goes past individual and has a key aspect of citizen/government contract. According to Bennington (2011), public value outcomes are articulated in terms of, political, social economic and ecological value attached to the public sphere. The values are adjoined to the tasks that can enhance the delivery of public services, superior quality of life and intangible outcomes such as increased justice and trust to citizens (Karunasena & Deng, 2011).

Considered as the other key building block in the creation of public value, trust as a concept signifies several things depending on the circumstances. According to Barnes and Gill (2000) trust refers to the extent of confidence apprehended by the public in respect to their government. Ranaweera (2016) viewed trust in government as "one's perceptions regarding the integrity and ability of the agency providing the service". Trust can also refer to the degree to which e-government systems deliver the required services in a reliable manner and operate in public best interest (Venkatesh et al., 2016). Moore (1995) contended that trust as the fulcrum of the citizen-state relationship providing legitimacy to government agenda and activities. Thus, a drop in trust levels may limit or even obliterate the generation of public value, albeit realizations of service and outcomes goals (Karunasena & Deng, 2012). Factors such as public services quality, the actions of public

officers and political establishments all play a role in influencing the variation of trust between government and citizens (Rutgers, 2015). In e-government context, trust can be viewed from different angles. The first angle is information not being accessed by an unauthorized person. The second angle is the guarantee that a transaction takes place as promised and the last perspective is that government officers will use data gathered for the purpose intended (Ciborra & Navarra, 2005). Further, Ranaweera (2016) identify another perspective of trust as "that individual's perception of structural assurance concepts (for example internet security, technical safeguard) that can alleviate assessed risks involved in online interactions, which in turn encourage the individuals to provide sensitive information and commit risky transactions".

2.5 Public Value and E-government Services

A close connection between the theory of public value and e-government was brought up initially by Kearns (2004). In an analytical discourse regarding the unwarranted prominence inclined to online services as the predominant facet of e-government systems, Kearns employed the effort of Kelly, Mulgan, and Muers (2002) directly in examining of e-government services public value. Lately, several studies have embraced the public value management paradigm in evaluating e-government services (Grimsley & Meehan, 2007; Karunasena, 2012; Osmani, 2014; Try & Radnor, 2007). Specifically, Grimsley and Meehan (2007) evaluated e-government projects in the United Kingdom based on public value theory while in Canada, Try and Radnor (2007) employ public value theory as a theoretical framework to study the implementation of the result-based management system. In Sri Lanka, Karunasena (2012) adopted public value theory to determine critical factors for e-government implementation. Osmani (2014) employed public value theory to examine the antecedents of public value in e-government services in the United Kingdom.

Worldwide, to advance e-government research a number of frameworks for assessing e-government based on public value have been employed (Grimsley & Meehan, 2007; Karunasena & Deng, 2012; Karunasena, Deng, & Karunasena, 2011; Kelly et al., 2002; Osmani, 2014). For instance, Kearns (2004) relying on the methodology by (Kelly et al., 2002) advanced a conceptual framework that investigated the contribution of e-government to the delivery of public services, realization of desirable outcomes, and advancement of

public trust. Nonetheless, Kearns (2004) framework disregards the public value sources of outcomes and trust as delineated by (Kelly et al., 2002). Karunasena et al. (2011) revised Kearn's (2004) framework by adding public organizations' effectiveness as an angle of assessing e-government public value. In the framework, the public organization effectiveness of public value was examined by efficiency, public organization accountability as well as citizens' overall discernments in relation to the effectiveness of public organization. Later, in Sri Lanka, Karunasena (2012) carried out an examination of the public value of e-government to validate the framework, Karunasema identified significant limitations of his study. He suggested for retested and revalidated of the framework after incorporating new factors that cropped up after merging quantitative and qualitative results.

Elsewhere, Grimsley and Meehan (2007) adapted Kelly *et al*.(2002) framework components namely; services, outcomes and trust. The public value framework by Grimsley and Meehan paid attention to four premises (provision of services, related outcomes from services, trust, and satisfaction). Grimsley and Meehan established a positive relationship between trust and satisfaction and intervening variables (personal control, well-informedness and influence) that positively influenced citizen satisfaction and trust. Verdegem et al. (2011) proposed an evaluation framework consisting of input, output, outcomes and impact elements in the public value chain. Inputs referred to financial and non-financial for the creation of outputs resulting to outcomes and impact. According to Verdegem et al. (2011), contextual factors such as IT infrastructure, human capital, politics, policy and cultural issues influence the input-output-outcome relation of e-government. In Kenya, Ogutu and Irungu (2013) developed a citizens-centric assessment framework for e-government systems in Kenya. They identified four constructs for evaluation of e-government system namely: financial, social, technical and delivery platform constructs. Nevertheless, they overlooked other factors such as policy and legal issues and their effect on e-government services (Akpan-Obong, 2010).

The next section provides empirical studies on the relationship between contextual factors (ICT infrastructure, human capital and governance) related constructs based on TOE theory (Tornatzky et al., 1990) and the public value of e-government services. The section also entails the indirect effect of e-government usage on the public value of e-government services and interaction effect of user experience on e-government usage and the public value of e-government services.

2.6 Contextual Factors and E-government Usage

E-government empirical research has exposed numerous degree of variance that implies that context matters in assessing e-government (Cordella & Bonina, 2012). Consequently, prior studies have incorporated contextual factors in e-government research. For instance, Wong and Welch (2004) in studying of website openness and government accountability has incorporated contextual element to examine the influence of the national public service system and the characteristics of the government agencies on the national level of public administration. Krishnan et al. (2012) studied the effects of contextual factors drawn from TOE theory on e-participation and e-government development. An extensive analysis of the literature on e-government (e.g.Krishnan, Teo, & Lim, 2012; Teo et al., 2008) identifies three contextual factors; ICT infrastructure, human capital and governance that might have an effect on usage of e-government services. Consequently, this research examines how the three contextual factors relate to e-government usage and public value of e-government services.

According to Ndou (2004), sufficient provision of ICT infrastructure is imperative to encourage usage of electronic services. Due to lack of a stable, reliable, and cheap ICT infrastructure, e-government usage will remain a pipe dream (Srivastava & Teo, 2010). From citizen-centric perspective, ICT infrastructure comprises availability of fast reliable and ICT networks to facilitate voice, data and media communication (Karunasena, 2012). ICT infrastructure also entails access to diverse access methods, such as, remote access by cellular phones, kiosks and satellite receivers which should be provided by governments so that all citizens can be served irrespective of their financial or physical capabilities (Reddick & Turner, 2012). Njuru (2011) study that focused on the implications of E-Government on Public Policy and Challenges of Adopting Technology in Kenya

identified ICT infrastructure to affect the adoption of technology. Similarly, Mpinganjira (2013) study in South Africa noted that uptake of e-government services is affected by lack of adequate ICT infrastructure. Hence, we can posit that the better the ICT infrastructure in a country the greater the usage of e-government Services.

Similarly, human capital has been acknowledged as a critical factor to the successful uptake of e-government (Sigwejo, 2015; Welch, Hinnant, & Moon, 2005). Building human capital capacity contributes to opportunities that change public management into a mechanism of collaborative governance which directly supports sustainable development outcomes (United Nations, 2014a). Citizens who are educated and trained are likely to accept and use e-government services (Srivastava & Teo, 2010). According to empirical findings by Al-Shafi and Weerakkody (2009) studying factors affecting e-government adoption in the state of Qatar. The findings of the sudy revealed a significant positive relationship between educational level and usage of e-government services.Thus, this study looks at the relationships between human capital in terms of education, skills, experience and attitude and usage of e-government services.

Past literature has as well demonstrated strong reasons to believe that governance in a country as another factor affecting usage and public value e-government services (Krishnan et al., 2012). According to Meso, Musa, Straub, and Mbarika, (2009) the construct of governance is gaining increasing focus as it is critical to producing and sustaining an environment rapid e-government development. Welch et al. (2005) disclosed that to efficiently and effectively implement public sector reforms into e-government context, effective governance is paramount. In an empirical study, Madon, Sahay, and Sudan (2007) found that governance issues such as policy and regulatory framework impact on effective e-government implementation and provision of public services. Further, good governance can be a result of e-government, the doctrines of good governance that include, state administration efficiency and effectiveness, law enforcement, formulation of sound public policies, equity and public participation determine the progress and success of e-government (Suhardi et al., 2015). Thus, taking a proxy view of governance impact, we posit that e-government usage in a country is positively associated with the quality of governance.

2.7 Contextual Factors and Public Value of E-government Services

Fusion of the local context incorporated into strategy and implementation models of e-government to a lesser or greater extent determines the outcome and meanings of e-government (Bwalya, Zulu, Grand, & Sebina, 2012). In IS, universality evaluation of e-governments is hard to carry on (Alshawi and Alalwany, 2009). Information systems outcomes are determined by context (Akpan-Obong, 2010). As a result, evaluation of e-government which embodies a specific kind of IS investment in the government is ostensibly informed by existing specific considerations of public sector IS evaluation. Luna-Reyes and Gil-Garcia (2011) conjecture most of e-government failure is as a consequence of dearth of sufficient understanding of the multifaceted associations among technologies, institutional establishments and organizational factors and also lack individuals' cognition of e-government inherent benefits. Hence, in-depth research of e-government-enabled public value creation to better comprehend the link between technology, organizational structures and stakeholders is vital (Rose, Persson, Heeager, et al., 2015).

For instance, ICT infrastructure has been acknowledged to be one of the determinant of e-government outcomes (Hanseth, Monteiro, & Hatling, 1996; Sinjeri et al., 2010). Further, literature puts a strong argument that spending in human capital creation pays dividend in terms of citizens' public value in a public services context. Nevertheless, more studies need to be carried out to expose how investment in individual human capital relates to e-government uptake. Equally, governance issues in terms of sound policy and regulatory framework, openness, transparency and the engagement of citizens in e-government activities affects e-government development (Girish et al., 2012). Arguably, citizen's trust towards her government originates from such elements. Subsequently, creating trust towards electronic services and resulting to a lever of e-government usage as they are valued. Thus, taking a proxy view, this study posits that ICT infrastructure, human capital and governance in a country are associated with the public value of e-government services.

2.8 User Experience and Public Value of E-government Services

One of the reasons that e-government investment does not realize its potential is that systems tend to focus less on the users while focusing more on the technical aspects (Xiong, 2006). Governments require to design their systems from the citizens' perspective so that to satisfy the user requirements. Previous studies indicate user experience directly influence users preference, opinion and attitude of services (Lee & Koubek, 2010). Consequently, In recent years, research on the interaction or people with systems has shifted from a problem-oriented, instrumental focus to more holistic view of experience people make before, during and after interaction (Glanznig, 2012).

A recent study by Karkin and Janssen (2014) on 16 Turkish Government websites discovered that though the sites are plausibly excellent at supporting requests and usability, the sites are far from satisfactory levels at offering platforms for citizen responsiveness, engagement and dialog. Karkin and Janssen (2014) recommend that the public value perspective embodied in the assessment of websites and other public efforts. This study, therefore, proposes that there is a link between user experience and the public value of e-government services.

2.9 E-government Usage and Public Value of E-government Services

Despite the growing investment in e-government services, the level of G2C e-government services usage is low worldwide (Savoldelli et al., 2014). In OECD countries, for instance, e-government usage averages out at 50 percent of its citizens, although there are great disparities among countries (United Nations, 2014a). Many people still contended with the long-established methods such as face to face to access public services instead of using the online government services. The problem of low e-government usage, more specifically G2C has puzzled many researchers, notwithstanding the anticipated inherent benefits of e-government.

Responding to the challenges of e-government usage, Lips and Schuppan (2009) among others, call for a broadening and deepening of scholarly perspective on e-government to progress knowledge within this area. While there exist a vast academic literature to date on e-government acceptance, notable insufficient literature of what circumstances and why

citizens prefer to use e-government services (Sivaji et al., 2014). Similarly, the vast majority of research effort thus far has favored supply-sides, necessitating for more studies to examine the demand side perspective (user- centric perspective) of e-government services. The demand side of e-government usually seeks to examine the use and the value of e-government services (Bannister & Connolly, 2014). In an attempt to bridge this gap in the literature, this study empirically investigated the association between the usage of e-government and the public value of e-government services.

2.10 Contextual Factors, E-government Usage and Public Value of E-government Services

Extant literature reveals that e-government usage is not a direct undertaking as it engrosses technical, human and organization factors (Al-Azri, Al-Salti, & Al-Karaghouli, 2010). Further, empirical studies have demonstrated a relationship between contextual factors such as ICT infrastructure and the public value of e-government (Karunasena, 2012). Other research proposes that such link is dependent on other intermediary factors including differing e-government services usage (Al-Sebie, 2011). To extend the knowledge that relates to the association between various factors, e-government usage and the public value of e-government services. This research examined the relationship mediating role of e-government usage on the relationship between contextual factors (ICT infrastructure, human capital, governance) and the public value of e-government services.

2.11 E-government Usage, User Experience and Public Value of E-government Services

Botha et al. (2012) aver that for successful uptake and use of technology user experience is a determining factor. According to Inglesant and Sasse (2007), user experience may contribute towards outcomes of e-government services by promoting an antagonistic or a cooperative relations between government and citizens or service users. Welch, Hinnant, and Moon (2005) in their study on the Council on Excellence in Government user experience, satisfaction, and trust, found that online government user experience was positively associated with e-government satisfaction.

Based on empirical literature, the interaction and participation of government departments and agencies in user experience varies widely, and it reflects a complete lack of interest in user experience and diverse echelons of usability in the systems of government

departments across the world (Glanznig, 2012). In an endeavor to bridge the gap in the literature, this study investigates these constructs by empirically investigating how the user experience may moderate e-government usage and the public value of e-government services.

2.12 Knowledge Gaps

In the literature review, both theoretical and empirical studies concerning contextual factors, e-government usage, user experience and public value of e-government services are discussed. A summary of empirical studies reviewed for this study is shown in Table 2.4.

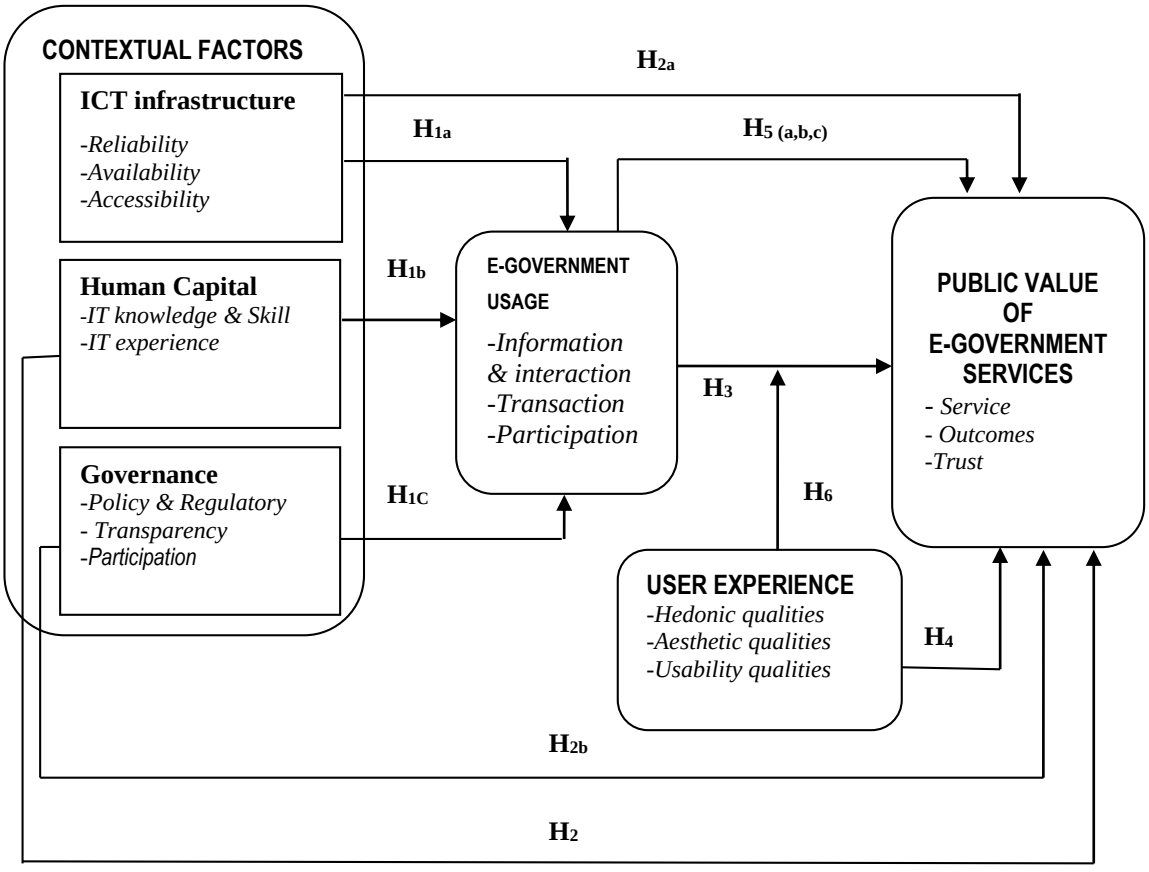
Table 2.4: Summary of Previous Studies and Knowledge Gaps

Researchers	Method and Focus	Findings	Gaps in knowledge	How gaps was addressed
Osmani (2014)	Empirical: Examined Antecedents of e-Government public value	Antecedents of public value, information, systems and service quality based on individual value	Used quantitative data, conducted in the UK and not based on government value	Both qualitative and quantitative techniques employed Research carried in Kenya context
Ogutu and Irungu (2013)	Empirical: Evaluating PSCK online services in Kenya	Indicate that success rate of e-government systems in terms of user satisfaction below 40%.	Limited only on technological factors Not based on public value	The study established the relationship between ICT infrastructure, human capital, governance and public value of e-government services
Karunasena (2011)	Empirical: Assessed e-government public value in Sri Lanka	ICT infrastructure, human capital affect public value	Governance issues not covered and the model may need to be validated	The study established the relationship between governance and e-government services public value
Al-Sebie (2011)	Theoretical: The Stages of e-government: association between characteristics that influence e-government systems	Hypothesized that e-government value increases with higher stages of e-government maturity	The model requires retesting and validation	The study validates whether the proposition that e-government usage and public value increases with respect to stages of e-government
Verdegem, Stragier and Verleye (2010)	Empirical: Evaluate Public value of e- government using data driven approach	Develop model for examining public value of e-government by use secondary data	Used only secondary data	The study used mainly primary data,
Alshawi and Alalwany, (2009)	Theoretical: Proposed IS evaluation be based on technical, social and economical issues	Assert that technical issues economic issues and social issues affect of e-government systems	Lack of detailed validation and assessment of the proposed criteria. Not based on public value	The study validated the technical, economic and social issues in evaluating e-government services public value
Karunasena and Deng (2009)	Theoretical: Develop a framework for assessing the e- government public value	public services quality, public Organization effectiveness, attainment of socially desirable outcomes impact public value	Focused on outcome No indicators are proposed to measure trust	The study focused on the process to determine the public value outcome and incorporate trust as a public value indicator
Chatfield and AlHujran (2007)	Theoretical: E-government assessment: a citizenry-centric approach using public value proposition	Developed, demand-side model that underlines the significance of generating public value through new e-government capabilities	The model need to be re-examined and re-confirmed	The study validated whether the proposition that e-government usage and public value increases with respect to e-government maturity.
Grimsley et al (2007)	Empirical: Evaluation-led design based on public value and user trust.	User/citizen experience indirectly influences satisfaction and trust of e-government services	Conducted in developed country setting. Used a case study	The study conducted in Kenya a developing country, A survey was conducted and User experience was incorporated as a moderating variable

2.13 Conceptual Framework

Based on the aforementioned theoretical discourse which was drawn from TOE framework, structuration theory and public value theory and e-government research literature, a conceptual framework depicting of the antecedents of e-government usage and the public value of e-government services was proposed as indicated in Figure 2.4. The technological context involves reliability, availability and accessibility of technology. The organizational context comprises IT knowledge and skills, attitude and experience while policy and regulatory structure, transparency and participation outline the environmental context. These factors are posited to influence e-government usage and how citizens value e-government services. The model also indicates the moderating effects of user experience on e-government usage and the public value of e-government services, the mediating effect on e-government usage on contextual factors and e-government services.

Figure 2.4: Conceptual Model



2.14 The Research Hypotheses

The study through a thorough review of literature seek to address the research problem by empirically testing the following Null hypotheses

$H0_{1a}$: There is no relationship between ICT infrastructure and e-government usage

$H0_{1b}$: There is no relationship between human capital and e-government usage

$H0_{1c}$: There is no relationship between governance and e-government usage

$H0_{2a}$: There is no relationship between ICT infrastructure and public value of e-government services

$H0_{2b}$: There is no relationship between human capital and public value of e-government services

$H0_{2c}$: There is no relationship between governance and public value of e-government services

$H0_{3}$: There is no significant relationship between e-government usage and the public Value of e-government services

$H0_{4}$: There is no significant relationship between user experience and the public value of e-government services

$H0_{5a}$: E-government usage has no significant mediating effect on ICT infrastructure and public value of e-government services

$H0_{5b}$: E-government usage has no significant mediating effect on human capital and public value of e-government services

$H0_{5c}$: E-government usage has no significant mediating effect on governance and public value of e-government services

$H0_{6}$: User experience has no significant moderating effect on the relationship between e-government usage and public value of e-government services

2.15 Chapter Summary

This chapter presented a theoretical and empirical literature review that provided a context-based e-government evaluation framework from a public value perspective. The literature review was guided by public value theory, ANT theory, and structuration theory for just like in other IS evaluations; the research topic under investigation was multidisciplinary in nature. Despite the need for thorough evaluation of e-government services, critical review of literature posits dearth of consistency in evaluation frameworks and models for e-government services. It was noted that e-government services evaluation to be a complex process. Further, the traditional approach to e-government evaluation focused on narrow technical and accounting measures. Hence, due to the narrow focus on the assessment of the public value of e-government services in developing nations, lack of concern of contextual factors affecting the public value of e-government services and reliability and validity issues, make the available frameworks inappropriate for use in Kenya. Therefore, drawing from the assortment of approaches and frameworks, discussed in the literature, a holistic framework was developed. The framework incorporated contextual factor (ICT infrastructure, human capital and governance) that were identified to affect e-government usage and public value of e-government services.

This chapter was separated into five sections. Section one reviewed the theories of e-government and public administration underpinning the study. The second section discussed the concept of e-government and public value in details focusing on definitions, structure among other attributes. The third section reviewed the public value e-government evaluation frameworks previously employed in different countries. The final section presented studies conducted relating to constructs that form the tenet of this study and finally formulated research hypotheses.

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CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents a detailed account of the research methodology and approaches that were adopted in conducting this study. These include the philosophical foundation, research design and population of the study, sampling approaches, data collection methods and how reliability and validity of data were ensured for both quantitative and qualitative aspect of this research. The chapter also presents how variables are measured and data analyzed.

3.2 Research Philosophy

In social science research are dependent upon one of the philosophical worldviews namely positivism, constructivism, and pragmatism (Creswell, 2009). The three philosophical assumptions; ontology, epistemology and methodology determines the philosophy preferred by a researcher (Collis & Hussey, 2013). Denzin and Lincoln (2011) accentuate that in practice; these assumptions embody a philosophical position that forms how researchers view the world and the strategies on how to carry out research and the procedural echelon; techniques and methods employed to perform research. The assumptions are briefly discussed in the next section.

3.2.1 Ontology

The assumptions underlying ontology comprises the form and nature of reality (Morgan, 2007). As a consideration, ontology is the initial point of research (Grix, 2010). In cognizance of the ontological supposition, the researcher needs to respond to the question of "what is the nature of reality" (Creswell, 2013). Two schools of thoughts namely objectivism and subjectivism endeavor to tackle this question (Bryman & Bell, 2015). An objectivist view of ontology portrays that social entities exist in reality autonomous to social actors interested in their being and the researcher has no influence. Conversely, subjective conformists claim that the social world is unlike the usual world. As a result, people who are contrary to physical objects are supposed to affix connotations to the phenomenon and events that enclose them and be in a position to change the world within their discernments and experience regarding it (Morgan, 2007).

3.2.2 Epistemology

The epistemology focuses on the inquiring of knowledge and what is accepted as being legitimate knowledge (Saunders, Saunders, Lewis, & Thornhill, 2011). The two contentious assumptions concerning ontology comprise subjective ontology and objective ontology that form two separate epistemological stands: interpretive epistemology and positive epistemology (Collis & Hussey, 2013). Positive epistemology deals with testing of hypothesis which is associated with deductive theory verification that proves the causal associations drawn on propositions from the literature (Bryman & Bell, 2015). Conversely, interpretive epistemology is linked with the examination of social occurrences through employment of interpretation of individuals (Collis & Hussey, 2013). Interpretive epistemology stresses the importance of discerning the procedures by which people eternalize their association to their world (Becker & Niehaves, 2007). Contrary to positivism, interpretivism alludes to the perspective that human beings and their institutions are in essence distinct from that of the normal science. In addition, the subjective connotation of social activities needs to be embraced by social scientists through applying a diverse coherent research process (Saunders et al., 2011).

3.2.3 Methodology

In the realm of methodology, positivist and interpretivist are the two main research approaches (Mingers, 2003; Neuman, 2006). Positivist approach is associated with quantitative research whereas the interpretivist approach is associated with qualitative research. Nonetheless, the two philosophical advancements hold positive and negative impacts on divergent perspective despite the core concern is the same (Bryman & Bell, 2015). The two methods are elaborated in the following section alongside with the justification for selecting of a specific philosophy employed in this research.

3.2.4 Positivist approach

The positivist paradigm presumes reality that is objective and can be described, observed and measured (Neuman, 2006). Positivism term is linked with Auguste Comte, a French philosopher in the mid of nineteenth century. In research inquiry, positivism has traditionally been the dominant paradigm, but it is still used in modern days (Cohen et al.,

2007). In positivism, a researcher commences with a theory, outcome of prior findings or individual observations, followed by formulating a hypothesis to be examined. After formulating hypothesis, what follows is data gathering and analysis of the collected data either supports or rejects the hypothesis. Data gathered within the pure positivist paradigm uses quantitative technique involving the representation of holistic phenomena in measurable, observable reductive variables. Nevertheless, while positivism has attested to be prominent on social science research, its purist derivative has been censured for lack of robustness in conducting research owing to a constricted definition of "the concept of science" (Johnson, Onwuegbuzie, & Turner, 2007). Onwuegbuzie (2009) affirms that although positivism advances the idea of objectivity towards confirmation and falsification, this position ignores the reality that a lot of human decisions are made in the process of conducting research. Furthermore, researchers are themselves members of a social context inclined to subjectivism. For instance, in choosing what to study, developing instruments be used in research and research findings interpretation.

The research methods applied by positivist were initially established in the natural sciences designed for researching natural events. In information systems, the widely used quantitative techniques are laboratory experiments and survey techniques (Orlikowski & Baroudi, 1991). In this study, a theoretical framing of public value evaluation of e-government which concerns ICT issues requires both first-order insights into the current situation and subjective interpretations of technical, organizational and political contexts by citizens. Given that the subjective contextual factors cannot be explicitly understood by using only the predictive hypothesis-testing measures of the variable (Klein & Myers, 1999), the positivist approach is not appropriate for this study.

3.2.5 Interpretivist Approach

The interpretive approach surfaced around 1960s to address the problems emanating with use a positivist paradigm. The interpretive approach postulates that the world cannot be observed as an objective reality but need to be comprehended relative to the subjective understanding of human experiences and behavior (Bryman & Bell, 2015). Interpretivist philosophy objects the positivist ideology and globally includes numerous forms of

qualitative research, for instance, constructivism. As a result, qualitative conformists also referred to as interpretivists or constructivists, contend for "the superiority of constructivism, idealism, relativism, humanism, hermeneutics, and, sometimes, postmodernism" (Srivastava & Thomson, 2009).

Qualitative conformists beliefs in multiple-assembled realities; hence, time- and context-free generalizations are neither acceptable nor attractive. Further, interpretivists assert implausibility of distinguishing entirely the "causes and the effects" on which definite generalizations are based. Positivists and interpretivists have been criticized for their extreme stand on research method and approach. In an effort to deal with paradigm-methodology weaknesses link held by two paradigm purists, there have been an increased appeals for a pragmatic philosophical perspective (Goldkuhl, 2004; Popa, Guillermin, & Dedeurwaerdere, 2015).

3.2.6 Pragmatism Philosophy

In the social sciences, pragmatism philosophy attempts to create a middle ground between the positivism and interpretivism stands. The pragmatist exemplified as repudiating the forced selection between interpretivism and positivism with respect to epistemology, methods, and logic in research (Tashakkori & Creswell, 2007). Taking a middle position, pragmatists upholds that scientific inquisition non-formalistic and the investigator may be together subjective and objective in epistemological direction in the process of answering a research problem. The fathers of pragmatism (Williams James, John Dewey, and Charles Sanders Peirce) considered pragmatism as a method of transcending the irresolvable, philosophical and metaphysical dilemmas (Halton, 2004). Felizer (2010) argues pragmatism approach has emerged as a reaction to the never-ending and fruitless contest between positivism and interpretivism. Pragmatism embraces the notion of plural and dynamic realities (multiple truths) or that there is no knowledge that is certain and/or universal. More so, pragmatism paradigm centers on what actually works to achieve certain requirements of the investigator and does not limit the researcher to particular approaches in responding the study question (Creswell & Plano, 2011). Hence, pragmatism permits the researcher to employ an array of research methods to appreciate the problem being studied (Mingers, 2003).

Several social scientists (e.g. Johnson & Onwuegbuzie, 2004; Morgan, 2007) have been credited for advocating pragmatic paradigm as a philosophical assumption that combines quantitative and qualitative methods. For example, Morgan (2007:73) claims "the great strength of this pragmatic approach to social science research methodology is its emphasis on the connection between epistemological concerns about the nature of the knowledge that we produce and technical concerns about the methods that we use to generate that knowledge".

The current research is considered normative; that is, it is not concerned with knowledge creation for its own sake, but as an instrumental means of contributing to a better grasping of the factors that affects e-government usage and e-government services public value in Kenya. In order to overcome the pernicious dualism of positivism and constructivism, this study took a middle stand between subjectivism and objectivism. The research took the paradigmatic stance of pragmatism to understand the contextual factors, e-government usage, user experience and the public value of e-government services. The pragmatic approach was also utilized since it aided the researcher to center on, and stress, the research problem, employing suitable data collection methods so as to completely understand the research problem (Creswell, 2013).

3.3 Research Design

This study settled for descriptive, exploratory and cross-sectional mixed methods research design. Using mixed methods approach, researchers surmount the weaknesses and utilize the strengths of qualitative and quantitative approaches by integrating both of them. More so, mixed-method approaches aid in responding to a wide and more comprehensive array of research questions (Johnson and Onwuegbuzie, 2004). In addition, mixed methods can be useful in boosting the generalisability of the findings of a study (Venkatesh, Brown, & Bala, 2013). Also, adopting of mixed methods approach permitted this study to accomplish evidence triangulation and complementarily. Gil-Garcia and Pardo (2006) aver that in IS, triangulation of data and findings contributes to knowledge through raising thoroughness in e-government research. This is particularly significant for researchers in developing countries, as a good number studies are deficient in analysis at different levels that offer a

superior comprehension of viewpoints of the IS development and specifically e-government. Parvez (2006) also recommends adoption of different data collection approaches when studying the duality of technology. Conversely, conducting research using mixed methods approach consumes resources and time to gather and examine both quantitative and qualitative data. In addition, it calls for the researchers to be knowledgeable with the collection and analyzing quantitative and qualitative data (Venkatesh et al., 2013).

Various mixed methods research design has been advanced in the literature (Caruth, 2013). In this study, convergent concurrent mixed methods approach was used, where qualitative and quantitative data was gathered alongside. This enabled obtaining of different data but complementary data on the same research problems, for a better understanding of the problem (Mingers, 2003). This approach was selected on a number of grounds. First, it permits the results to be confirmed, cross-validated, and substantiated in a single study. Second, this approach resulted in a shorter data collection time compared to other mixed methods approaches, for instance, the sequential approaches (Creswell and Plano Clark, 2007). The next section presents a comprehensive account of the research approach used during the two strands commencing with the quantitative strand.

3.4 Quantitative Strand of the Study

3.4.1 Justification for Using Quantitative Approach

Creswell (2013) intrinsic benefits of the quantitative research approach informed the researcher resolute to exploit quantitative method in this study. First, the method allows the investigator to explicate and empirically examine the correlation between the factors conceptualized in the literature review. Second, the quantitative approach allows collection of numeric data by the researcher by employing devices with pre-set questions and responses from a large number of respondents.

3.4.2 Population of the Study

The target population of this research was Kenyan citizens who had earlier used electronic government services. To develop an accurate judgment of the e-government services public value, this study placed a premium on previous usage of online government services to guarantee precise impressions were captured from the respondents (Belanger & Carter, 2008; Kolsaker & Lee-Kelley, 2008). According to the United Nations Survey of 2014, about 42.5 % of Kenyan was estimated to use e-government services (United Nations, 2014). Drawing from Kenya population 2009 Census, the total population of Kenya was 38.6 million (KNBS, 2009). Therefore the target population of this study was 16.4 million.

3.4.3 Sampling

Sampling refers to a procedure in which researchers select a sample from obtainable part of the population. In this study, each person who had previously used e-government services became part of the population. Moreover, since this study employed structured equation modeling (SEM) to evaluate the proposed structural model and testing of hypotheses, the issue of sample size was vital for its assumption tests and statistical analysis. The sample size was also a central factor in examining the extent to which the processes of the existing model evaluation could be dependable. However, in SEM there is no standard sample size in the absolute sense, and larger samples are always preferable (Kline, 2011). SEM literature proposes a sample size of greater than 200 (Markus, 2012). Bentler and Chou (1987) suggested a minimum of 5 cases per parameter estimate (path coefficients and error terms included). As depicted in Figure (a), Appendix III the model for this research consisted of 51 parameters for estimation. Therefore, a minimum of 255 sample size was desirable for this study.

To select the sample, a multi-stage sampling design was used. According to Kenya National Census Bureau of Statistics (KNBS, 2009), Kenya comprises of eight regions. The regions are further divided into counties representing devolved systems of government and the need to have static administrative boundaries (KNBS, 2014). This study used population sample that included a representative sample from the eight regions and one county representing each region. In Kenya, e-government services are mostly accessible

and available in urban areas. The sample was selected from the urban areas that were spread across urban and rural counties settings. The rationale for focusing on urban and rural counties was informed by the veracity that experience of e-government in rural and urban setups differs in respect to ICT skills and literacy, internet penetration and ICT infrastructure.

Rather than of sampling individual units, a sample group referred to as clusters that happen naturally in the population was used. Specifically, to select a representative sample, Kenya was stratified into regions (formerly represented provinces), and then the first stage sampling involved selecting one county in each region. The eight counties selected were Nairobi, Mombasa, Garissa, Nyeri, Bungoma, Homabay, Kitui and Narok. The second stage involved selection of sample points (clusters) based on urban centers in the selected counties. The final stage involved random sampling of 50 respondents in each selected clusters by visiting internet cafes, Huduma centers, government offices and private sector organizations.

3.4.4 Data Collection

A survey questionnaire was adopted to implement the quantitative aspect of this research to collect primary data from the respondents. A closed-ended survey questionnaire was developed. Close-ended questions were used for it was much easier to code and analyze data. The questionnaire consisted two sections (Appendix 1). The first section was intended for gathering respondent's demographic information while section two was designed to collect the data essential for examining and validation the conceptual framework. A Likert-type scale of five points was employed to prepare the items of the questionnaire. The Likert-type scale was considered dependable for its useful in obtaining people's values, perceptions and attitudes.

Since the participants were selected from different places and some respondents were unable to fill the questionnaire right away, two methods were employed to administer the questionnaires. Self administered survey was used targeting respondents in cyber café, town centres, shopping malls, bus stops and learning institutions. An online survey

questionnaire was also used. The online survey questionnaire targeted those respondents who could not fill the questionnaire right away and were willing to be contacted later through their email address. [3]*LimeSurvey* application program was used to prepare the online survey questionnaire. The online questionnaire was activated through respondent's email addresses.

3.4.5 Operationalization of the Variables

The various constructs of the study are operationalized as indicated in Table 3.1

Table 3.1: Operationalization of the Variables

Variable	Indicators	Measures	Questionnaire items	Supporting literature
Contextual Factors	ICT Infrastructure	Reliability, availability, accessibility	2.1a : 1-12	(Karkin & Janssen, 2014; Karunasena & Deng, 2012)
	Human Capital	IT knowledge & skills, IT experience,	2.1b: 1-7	(Karunasena & Deng, 2012; Srivastava & Teo, 2010)
	Governance	policy and regulatory issues, Transparency & participation	2.1c : 1-10	(Ciborra & Navarra, 2005; Kustec-Lipicer & Kovač, 2008)
E-government Usage	Usage	Information, transaction, participation	3.1: 1-9	(Chatfield & AlHujran, 2007; Lee, 2010)
User Experience	Hedonic qualities	Enjoyment and disorientation	4.1: 1-7	(Hassenzahl & Tractinsky, 2006)
	Aesthetic qualities	Visual appealing, clarity, well presented, style	4.1: 8-17	(Law, Roto, Hassenzahl, Vermeeren, & Kort, 2009; O'Brien, 2010)
	Pragmatic qualities	Effective, efficiency learnability, operability.	4.1: 8-17	(Law, Roto, Hassenzahl, Vermeeren, & Kort, 2009; O'Brien, 2010)
Public Value	Service	Satisfaction, importance, cost, fairness	5.1:1-10	(Grimsley & Meehan, 2007; Kelly et al., 2002; Osmani, 2014)
	Outcomes	Equity, improved environment, reduced corruption, poverty reduction	5.1:11-14	(Karunasena, 2012; Kearns, 2004)
	Trust:	Security, privacy, credibility, confidentiality	5.1:14-18	(Grimsley & Meehan, 2007; Kelly et al., 2002; Osmani, 2014)

3.4.6 Reliability Tests

Reliability of the measurement scales was examined by inspecting the internal consistency and the loading of a set of items on each construct. Reliability test determines the extent to which latent construct indicators are consistent internally in their measurements (Bryman

[3] *LimeSurvey: an open source program used to prepare online survey questions.*

& Bell, 2015). To check internal consistency, this study used Cronbach's Alpha (1951) coefficient. Hair et al. (2010) recommend 0.70 coefficients as the lower threshold of internal reliability. However, Pallant (2013) contends that 0.60 coefficients to be fine for internal reliability. The mean inter-item correlation for the items was also reported to provide credibility of the scales reliability as Cronbach's Alpha test is susceptible to the number or the length of scale of measures on the scale. The inter-item correlation recommended ranges from 0.2 and 0.5 or 0.015-0.15 in cases of higher order construct measures.

3.4.7 Validity Tests

Quantitative research is regarded credible after it employs a validation measurement techniques that tackles three validity issues namely: instrument, internal and statistical conclusion validity (Straub, 1989). According to Straub instrument validity is when a validated instrument measures what it is expected to measure while internal validity is when the validated tool must assess each and all likely variance and alternative hypothesis. Statistical conclusion validity refers to when the study results are obtained using the right statistical procedures and techniques.

Instrument validity was measured using content and construct validity. The extent to which a measure sufficiently and broadly measures what it alleges to be measuring reflects content validity (Hair, Black, Babin, Anderson, & Tatham, 2010). It deals with sample-population representativeness; for example, the knowledge and skills represented by the test items need to be a representative of the larger domain of knowledge and skills. Bias generated by an unrepresentative instrument will carry over into uncertainty in the results. As a result, there is no easy way to determine content validity aside from expert opinions. In this study, quantitative strand content validity was ascertained through the literature review and through the guidance of the supervisors who are experts in the study area.

Modell (2005) defines construct validity as "whether theoretical concepts are adequately reflected by the operational definitions and measures of empirical phenomenon". Normally, quantitative research formulates hypotheses to be pursued. In a hypothesis testing research,

construct validity is usually tested using intricate statistical techniques (Johnson et al., 2007). SEM was employed for hypotheses testing as it assumes an association between exogenous variables and endogenous variables derived from the findings of empirical work and theoretical foundation. To establish construct validity in SEM, convergent and discriminant validity were examined (Byrne, 2013; Kline, 2011).

Convergent validity refers to as "the degree to which observed variables of a particular construct share a high segment of the variance in common" (Markus, 2012). Three test; constructs factor loadings, average variance extracted (AVE) and construct reliability (CR) estimation were employed to examine each of construct convergent validity (Byrne, 2013). Hair et al. (2006) recommend that best-standardized loading approximations equal to or higher than 0.7, AVE estimation for must be greater than 0.5, and reliability estimates for tolerable convergent validity ought to be greater than 0.7. Discriminant validity delineates the extent to which a latent construct is actually dissimilar from other latent constructs (Markus, 2012). To determine discriminant validity the AVE for each variable is related with the equivalent squared interconstruct correlations (SIC). If the AVE approximation is constantly higher than the SIC approximations signifies existence of discriminant validity of the construct (Hair et al., 2010).

Internal validity threats of this research were mitigated by evaluating all the substitute elucidations of the strength of the associations between constructs (Straub, 1989). Different competing SEM models were applied to identify all probable associations between the variables of the study that were theoretically reasonable. Finally, the threats of statistical conclusion validity of quantitative data were addressed by using the covariance-based SEM techniques AMOS to analyze the collected data. According to Markus (2012), SEM techniques are extensively accepted as ways of ascertaining study statistical conclusion validity.

3.4.8 Pilot Testing

Bryman and Bell (2015) advise that it enviable to carry out a pilot test to check the data collection instruments before actual data collection. For quantitative aspect of this research, pilot surveys were conducted to test all dimensions of the questionnaire, including question wording, content, form, sequence, layout, question difficulty and the clarity of instructions. There were also some personal discussions with the academic staff to generate more input from the comments and suggestion made. Generally, most comments were regarding the understanding of phrases included in the questions, item presentation and sequencing of the questions. This provided suggestions for the improvement of the wording and sequencing of items and the general manifestation of the questionnaire.

3.4.9 Quantitative Data Analysis

To analyze quantitative data, first, the data collected was cleaned to guarantee that data contained no missing values or outliers. Then, to describe the essential features of the data, descriptive statistics was conducted using SPSS (Pallant, 2013). Prior to using structural equation modeling, exploratory factor analysis (EFA) was conducted. EFA was conducted to inspect the structure of the associations among a large number of multiple variables (Treiblmaier & Filzmoser, 2010). Straub (1989) asserts that performing EFA aids in establishing whether certain items set does or does not represent a construct and checking of cross loading of items across constructs. Measurement model analysis and testing of a model of the proposed hypothesized model in Table 3.3 was done using SEM (Appendix 4). Specifically, SEM was utilized to evaluate the measurement model, confirm the fit of the model and to verify the constructs' convergent and discriminant validity. Subsequently, the structural model, built from refined measurement models was inspected and hypotheses testing conducted (Hair et al., 2010).

3.4.9.1 Structural Equation Modelling

Structural equation modeling (SEM) refers to second-generation multivariate statistical technique increasingly being applied in the social sciences (Hair, Gabriel, & Patel, 2014). As opposed to the first generation statistical techniques such as logistic regression and analysis of variance which lack the ability to performing paths analysis in one single test,

SEM can perform evaluation of multiple variables and their relationships in a single comprehensive check (Bagozzi & Yi, 2012). Precisely, SEM has the ability to perform simultaneous analysis of measurement and structural models (Astrachan, Patel, & Wanzenried, 2014). Measurement model comprises items loading analysis that are likely to congregate on their proposed variables while structural model entails assessing the proposed hypothesis among independent and dependent constructs sets and provides the overall model fit (Shanmugam & Marsh, 2015).

Structural equation modeling was also employed on the following grounds. SEM has the capability of examining and correcting measurement error. Markus (2012) argues that disregarding measurement error may result in bias in estimating parameters. SEM permits for the specification and examination of intricate path models that comprises a complex comprehension of sophisticated phenomena, and it performs analysis considering all queries of measurements and prediction at the same time (Markus, 2012). SEM offers the researcher with the ability to model the dealings among manifest and latent constructs, and the associations between a bigger numbers of latent constructs (Bagozzi & Yi, 2012). Also, instead of taking an exploratory approach, to analyze data, SEM takes a confirmatory approach (Schumacker & Lomax, 2004). Finally, SEM offers modification indices that spell out and locate where the fit of a given model is particularly poor. SEM procedure provides all the information regard path analysis, including measures of explained variance, path coefficient and total effects (Byrne, 2013). Due to the benefits outlined, lately, SEM has grown to be an indispensable analytical method for testing and developing theories and is seen as a more powerful technique than other conventional multivariate procedures.

Partial Least Square SEM (PLS-SEM) or variance based SEM and covariance-based SEM (CB-SEM) are the two prevalent SEM based techniques. PLS-SEM that use least square procedure centers on maximizing explicated endogenous variance constructs while as opposed to maximizing explained variance, CB-SEM that use maximum likelihood procedure involves minimizing the difference between the observed and estimated covariance matrices (Astrachan et al., 2014). The two methods have dissimilar objectives with CB-SEM relevant to CFA and PLS-SEM more applicable in exploratory research in the discovery and assessing causal relationships (Hair et al., 2014).

This study used CB-SEM, the Analysis of Moment Structures (AMOS) software to assess, develop and modify the proposed theoretical model and perform complex SEM analysis. AMOS software was preferred to other CB-SEM such as LISREL for it encompass a user-friendly graphic user interface comprising a sophisticated computing capability (Arbuckle, 2013). Further, the CB-SEM technique makes possible evaluation of second or even third order constructs in theoretical models. A measurement model of first order contains a latent constructs with single layer whereas measurement model of second-order contains latent constructs with two layers. Theoretically, second-order construct causes the first-order constructs, which in turn cause the measured variables (Hair et al., 2010). The use of higher order constructs results to an enhanced parsimonious model and development of theory. However, it must be accentuated that the eventual rationalization for adopting higher order constructs in research should be based on theory (Astrachan et al., 2014).

Furthermore, a structural model can be intricate and interactive effects can be evaluated when using CB-SEM. In the processes of executing CB-SEM, each indicator error terms are modeled and individual indicator loadings are obtained. This process helps in eliminating of indicators with low loadings and/or large error terms. The purpose of eradicating high measurement errors and loading items that are low is to obtain a model with a tolerable fit between the observed and estimated models in order that structural models can then be evaluated (Hair et al., 2014). This result to improving the quality of latent constructs model. In particular, the CFA stage of CB-SEM permits all latent constructs to mutually covary and thus allows quantitative evaluation of both convergent and discriminant validity for each construct. Likewise, the congeneric covariance model as well allows simultaneous optimization of correlations among all constructs (Hair, 2010).

3.4.9.2 The Mediation Analysis in Structural Equation Modelling

Related with Objective 5 of the study, the null hypotheses $H0_{5a}$, H05b and $H0_{5c}$ representing contextual factors namely ICT infrastructure, human capital and governance respectively assumed no mediating effect on the association between e-government usage and public value of e-government services. In SEM, to test mediation effect, extant literature indicates existence of three main approaches; Baron and Kenny's mediation analysis, the bootstrap method and the Sobel test in SEM (Hadi, Abdullah, & Sentosa,

2016; Maxwell, Cole, & Mitchell, 2011). In Baron and Kenny's mediation analysis, the researcher must first establish that there is statistical significance between the independent and dependent constructs. For example, there must be a positive and significant relationship between contextual factors and the public value e-government services. Secondly, the researcher must prove statistical significance between the independent construct and the mediating construct. For instance, contextual factors must have a positive and significant correlation with e-government usage. Subsequently, the researcher must demonstrate a statistical significance between the mediating construct and the dependent construct. Finally, the researcher must examine the direct effect after controlling for the mediating variable. If the introduction of the intervener invalidates the direct association, there is full mediation; if not, mediation is partial or absent. Baron and Kenny's mediation analysis approach possesses inherent flaws when employed to conduct mediation analysis. Firstly, existence of mediation is likely even when there is no statistical significance between independent and dependent variable (Pardo & Roman, 2013). Secondly, the approach exhibits a deficiency of effectiveness in the process of gauging the strength of mediation, as mediation analysis calls for appropriate specification of the hypothesis (James, Mulaik, & Brett, 2006).

The bootstrap approach is a non-parametric resampling test developed by (Preacher & Hayes, 2004). The method does not depend on normality assumption and is appropriate for smaller sample sizes (Pardo & Roman, 2013). Sobel test also referred to as the product of coefficient approach test provides approximate test of significance for the independent construct on the dependent construct through intervener called indirect effect (Sobel, 1982). The method presupposes normality of indirect effect of the sampling distribution and the method is appropriate for more complicated model (Baron & Kenny, 1986). Sobel test is often used to supplement of Baron and Kenny mediation analysis approach of casual steps that requires all path to be significant first (Hayes, 2009).

This research applied Sobel test for mediation effects by Sobel (1982) with bootstrapped standard errors to conduct mediation analysis. Bootstrapping was essential to mitigate the major flaw of using Sobel test without bootstrapping (Bollen & Stine, 1990). The method was preferred because compared to the other techniques used to test mediation; Sobel test

with bootstrapped standard errors possess a number of inherent advantages. First, no distributional assumptions are required to be made by the researcher for parametric procedures. Second, relative to other mediation testing techniques bootstrapping perform better in mediation. Bootstrapping helps to generate an estimation of the sampling distribution in order to achieve precise confidence intervals than confidence intervals produced as of employing typical methods (Hayes and Preacher, 2010). Sobel test through bootstrapped standard errors generally is advantageous than other parametric techniques to moderate small samples in regards statistical power and of Type 1 error rates. Also, confidence intervals from bootstrapping are apparent to be asymmetric, very intimately similar to the actual normal random variables sampling distribution of products. This study performed a Sobel test with bootstrapped standard errors using 2000 re-sampling.

3.4.9.3 Moderation Analysis in Structural Equation Modelling

Related with Objective 6 of the study, the null hypothesis ($H0_6$) assumed no moderating effect of user experience on the association between e-government usage and public value of e-government. An enormous discourse by scholars has not come up with an agreement on a single method that is superior for testing moderation services (Henseler & Chin, 2010; Lin, Wen, Marsh, & Lin, 2010; Marsh, Wen, & Hau, 2004; Steinmetz, Davidov, & Schmidt, 2011). A simulation study by revealed that the method performance may depend with sample size, model complexity or research objectives. Lately, two methods to latent interaction modeling techniques intended at that providing processes that are easy to use by researchers have been recommended: (1) the unconstrained method by Marsh, Wen, and Hau (2004) that recommends excluding a great number of the constraints. (2) Residual centering method also is known as orthogonalizing method by (Little, Bovaird, & Widaman, 2006) employs the residuals as an indicator of the product. Between the two methods, this research applies orthogonalizing method. The method was preferred for a number of inherent advantages. First, it requires no constraints to be fixed on projected parameters. Second, the standard errors and regression coefficients of the first-order effect terms are stable after entering a higher-order term (Steinmetz et al., 2011). Moreover, the findings of Monte Carlo experiment (simulation studies) by estimating accuracy, statistical power and prediction accuracy revealed that this method is better in relationship to other

approaches of scrutinizing the effects of latent interaction and hence recommended under most circumstances (Henseler & Chin, 2010). Finally, this approach could be executed by employing any SEM program including AMOS (Little et al., 2006). Therefore, drawing conclusions based on the literature reviewed, it was resolved to use the orthogonal approach to testing moderating effects of user experience on e-government usage and public value of e-government services.

The procedure of testing moderation using the orthogonalizing approach consists of two steps: The first step involves producing interaction term indicators by getting the product of indicators of the first-order variables indicators followed by a regression of every product indicator on the first-order indicators that produced each product terms that is, all the variables first-order indicators. Then, the residuals regression residuals are stored as interaction latent variable indicators that are absolutely orthogonal to the first-order latent constructs. The residuals of these regression examinations are stored in the data set. In step two, the residuals are employed as indicators of the product construct in the latent interaction model (Lin et al., 2010). Table 3.2 provides a summary of data analysis procedure based on SEM modeling diagram in Appendix III figure (a).

Table 3.2: Summary of Data Analysis Procedures

Research Objectives	Null Hypotheses	Mathematical model	Analysis	Interpretation
1. To examine the relationship between contextual factors (ICT infrastructure, human capital and governance) and e-government usage	**$H0_{1a}$** There is no relationship between ICT infrastructure η_1 and e-government usage η_4	$\eta_4 = \alpha_0 \beta_1\eta_1 + \varepsilon_6$	**STRUCTURED EQUATION MODELLING**	Path coefficient **β_1** indicates the strength of the relationship between ICT infrastructure (**η_1**) and e-government usage η_4
	$H0_{1b}$: there is no relationship between human capital η_2 and e-government usage η_4	$\eta_4 = \alpha_0 + \beta_2\eta_2 + \varepsilon_6$		Path coefficient **β_2** indicates the strength of the association between Human Capital (**η_2**) and e-government usage η_4
	$H0_{1c}$: There is no the relationship between governance η_3 and e-government usage η_4	$\eta_4 = \alpha_0 + \beta_3\eta_3 + \varepsilon_6$		Path coefficient **β_3** indicates the strength of the association between governance (**η_3**) and the e-government usage η_4.
2. To examine the relationship between contextual factors (ICT infrastructure, human capital and governance) and public value of e-government services.	**$H0_{1a}$** There is no relationship between ICT infrastructure η_1 and PVES η_6	$\eta_6 = \alpha_0 \beta_1\eta_1 + \varepsilon_6$		Path coefficient **β_1** indicates the strength of the relationship between ICT infrastructure (**η_1**) and PVES **(η_6).**
	$H0_{1b}$: there is no relationship between human capital η_2 and PVES η_6	$\eta_6 = \alpha_0 + \beta_2\eta_2 + \varepsilon_6$		Path coefficient **β_2** indicates the strength of the association between Human Capital (**η_2**) and the PVES **(η_6).**
	$H0_{1c}$: There is no the relationship between governance η_3 and PVES η_6	$\eta_6 = \alpha_0 + \beta_3\eta_3 + \varepsilon_6$		Path coefficient **β_3** indicates the strength of the association between governance (**η_6**) and the PVES **(η_6).**
3. To establish the relationship between e-government usage and PVES	**$H0_3$:** There is no the relationship between e-government usage η_4 and PVES η_6	$\eta_6 = \alpha_0 + \beta_6\eta_5 + \varepsilon_6$		Path coefficient β_6 indicates the strength of the relationship between e-government usage (**η_6**) and PVES **(η_6).**
4. To determine the link between e-government usage on PVES	**$H0_4$:** There is no relationship between User Experience η_4 on the PVES η_6	$\eta_6 = \alpha_0 + \beta_6\eta_4 + \varepsilon_6$		Path coefficient β_6 indicates the strength of the relationship between user experience (**η_4**) and PVES **(η_6).**
5. To establish the mediating effect of e-government usage on the relationship between (ICT infrastructure, Human Capital, Governance) to public value of e-government services	**$H0_{5a}$:** There is no mediating effect of e-government usage η_9 on the relationship between ICT infrastructure η_1 and the PVES η_6	$\eta_6 = \alpha_0 + \beta_{12}\eta_9 + \varepsilon_6$ Where $\Pi_7 = \Pi_{1*} \Pi_{2*} \Pi_3$		Path coefficient β_{12} indicates the strength of the intervening effect of η_9 on the association between ICT infrastructure and the PVES **(η_6).**
	$H0_{5b}$: There is no mediating effect of e-government usage η_9 on ther relationship bewtten Human Capital η_2 and PVES η_6	$\eta_6 = \alpha_0 + \beta_{12}\eta_9 + \varepsilon_6$ Where $\Pi_7 = \Pi_{1*} \Pi_{2*} \Pi_3$		Path coefficient β_{12} indicates the strength of the intervening effect of η_9 on the association between Human Capital and the PVES **(η_6).**
	$H0_{5c}$: There is no mediating effect of e-government usage η_9 on the relationship between Governance η_3 and PVES η_6	$\eta_6 = \alpha_0 + \beta_{12}\eta_7 + \varepsilon_6$ Where $\Pi_7 = \Pi_{1*} \Pi_{2*} \Pi_3$		Path coefficient β_{12} indicates the strength of the intervening effect of η_9 on the association between Governance and the PVES **(η_6).**
6. To establish the moderating effect of user experience on e-government relationship between e-government usage and PVES	**$H0_6$:** There is no moderating effect of user experience η_5 on e-government usage η_4 and PVES η_6	$\eta_6 = \alpha_6 + \beta_{14}\eta_8 + \varepsilon_6$		Path coefficient β_{14}indicates the strength of the moderating effect of η_5 on the relationship between e-government usage (**η_4**) and the PVES **(η_6).**

3.5 Qualitative Strand of the Study

3.5.1 Justification for Using Qualitative Approach

The resolute for this study using the qualitative approach was informed by Creswell's (2013) inherent benefits of qualitative research approach. Foremost, Creswell posits that qualitative approach presumes that research is carried out in an environment that is informal which allows the participants to open up on the topic under investigation. Secondly, the qualitative approach provides an opportunity for the participants to be listened to; this allows the researcher to look at issues through the eyes of the participants. Furthermore, in the current study a great extent of the research entails user's perception where listening to the participants is indispensable. Lastly, using qualitative approach provides an opportunity for the investigator to intermingle with the participants of the research. The interaction involving participant and researcher is essential for this research as it elicits user perception.

3.5.2 Sampling

To collect qualitative data, the study used purposive non-probability sampling. Creswell (2013) recommends that the same people who partake part in the survey to be chosen for the purposive sampling. For in-depth qualitative study a small number of participants is also recommended and five to fifty sample size is satisfactory (Dworkin, 2012).

According to Rubin and Rubin (2011) for interview results to be more convincing, interviewees need to be knowledgeable and experienced in the area you are interviewing about. In this respect, nine participants (1 Garissa County, 2 Bungoma County, 3 Nyeri County and 3 Nairobi County) who had previously used e-government services were recruited for interviews for the qualitative sample.

3.5.3 Qualitative Data Collection

The in-depth interviews were carried out to gather data for qualitative thread of this study. In-depth interview refers to a technique of collecting data which can be described as a purposeful, guided conservation between two people with the intention of gathering descriptive data in the subject's own words (Neuman, 2006). Yin (2015) identified

unstructured, semi-structured and structured interviews as the three main forms of qualitative interviews. Semi-structured was adopted to collect qualitative data in this study. Semi-structured interview enabled the researcher to systematically acquire adequate information to address pertinent issues represented in research questions while still preserving some sense of informality and controlling the conversation of the interviews (Eriksson & Kovalainen, 2015).

The process of conducting interview comprised of preparation, introduction, asking questions, and conclusion stages. Preparation and introduction involved the researcher making effort to collect information about the interviewee and to seek out matters that may be essential for them. Preparation and introduction helped the researcher to attain trust from the participants. Before the commencement of each actual interview, an attempt was made to create a conducive environment and build trust all through the interview. In general, the interviews commenced by presenting succinct preamble of the research area, the rationale of the study, and how the information from the research would be used (Rubin & Rubin, 2011).

After the introduction, diverse questions were asked that included the main probing, follow-up questions (Bryman & Bell, 2015). The interview guide (Appendix II) comprising an inventory of key questions was used to ensure that the main matters were meticulously assessed in every interview and to enhance the uniformity across the interviews. The interview guide was derived from extensive literature review. Walsham (2006) asserts that in a qualitative investigation, researchers may employ a conceptual framework at the preliminary phases of the examination to direct the data collection. The interview guide was employed with flexibility so that in the course of each interview new ideas were pursued. During the interview, follow-up questions were regularly asked to persuade the participants to provide more details of the main interview themes as construed in the theoretical framework.

Face-to- face interviews were used to gather information from partipants. The researcher took notes instead of recording as many of participants preferred the researcher to take written notes rather than digital audio recording. Largely, the process of data collection was successful. Nonetheless, the researcher experienced some intricacies. For instance, the research topic entailed a lot of information that sometime was difficult to write down all information from interviewees as some interviewee spoke fast. In circumstances such as these, to mitigate some information not being lost, immediately the interview was concluded and the short-term memory was still fresh, right away, the researcher went into the nearest coffee outlet and wrote down whatever he could remember about the interview.

3.5.4 Reliability Tests

To assess reliability of the qualitative research, this study used a method applied by Arksey and Knight (1999). In this method, through the data gathering process, an attempt was ensured to lessen bias and errors, and to guarantee that gathered data was the accurate value of what interviewees provided. This was achieved through asking of main questions to guarantee the dependable responses were obtained from interviewees. Inquisitive questions were asked to decrease reliability threats. The inquisitive questions permitted the research to embrace various challenges emanating from the human mind's limitations and complexities (Rubin & Rubin, 2011). In addition, efforts were as well made to shun leading questions and other possible bias overture. Constant coding system was used by the researcher to improve the reliability throughout the data analysis process. Franklin and Ballan (2001) contend that despite qualitative data analyses being not clear and personalistic, a coding procedure that is consistent enhances reliability in a qualitative research.

3.5.5 Validity Tests

Achieving construct validity is considered difficult in qualitative research (Yin, 2011). The researcher's bias and subjectivity ingrained in the analysis process of data poses a considerable danger to the qualitative research validity. This research employed credibility, transferability and confirmability techniques to ensure validity in qualitative research (Lincoln & Guba, 1985). These techniques are commonly used in contemporary qualitative

research (Rubin & Rubin, 2011). To guarantee the study has credibility, the analysis comprised a review of notes, rechecking of participants and triangulation. Employing multiple methods in this research decreased the construct validity threats as the indicators employed in the quantitative approach were used in the qualitative interviews in order to verify the exactness of the indicators meaning achieved transferability. Confirmability was guaranteed by utilizing some main coding techniques such as regular comparison. This was useful in safeguarding against bias and help in attaining immense precision.

3.5.6 Pilot Testing

Pilot testing of the interview guide was conducted. Two interviewees whom the researcher felt had the experience; knowledge and ability to answer questions were interviewed. Based on the pilot, slight adjustment was done on the order of the questions and more probing questions were added.

3.5.7 Qualitative Data Analysis

Qualitative data analysis refers to the breaking, organizing and management of data into patterns and units to determine what can be discerned, what is significant and what to inform others (Bogdan & Biklen, 1998). Content and thematic analyses are the two commonly used types of qualitative analysis techniques. Thematic analysis was selected to analyze the qualitative data in this research. Particularly, theory-driven thematic analysis (deductive approach) was used to analyze qualitative data. Deductive approach implies that researchers make use of existing theory as opposed to the inductive approach that tries to build up a theory drawing on the data gathered (Saunders et al., 2011). Thematic analysis consists of identifying, analyzing and reporting themes (patterns) in a qualitative data set (Braun & Clarke, 2006). Thematic analysis offers a systematic approach to summarizing an enormous amount of data into momentous and expressive patterns or themes (Howitt, 2010). Thematic analysis has the ability to summarize sophisticated qualitative data through discovering the hidden themes that emerge within the dataset gathered (Braun & Clarke, 2006).

Thematic analysis may consist of several steps. Borrowing from Braun and Clarke (2006), this study employed four steps namely; familiarization with data to be collected; coding; themes searching; and reviewing codes and developing analytical codes. Familiarizing with data entailed getting deeper indulgent of the particulars of the set of data collected including background information regarding the interviewees including age, gender, occupation and information sharing rule. Coding entails in ascribing particular codes for every line or supplementary lines of text written down (Rubin & Rubin, 2011). In this study, the data categories and codes employed in analyzing the data were drawn from existing theories and sprung from a predetermined conceptual framework. The elicited themes, sub-themes and codes were as indicated in Table 3.3

Table 3.3: Coding of Qualitative Data

Theme	**Sub-theme**	**Codes**
ICT Infrastructure	Reliability	Dependable
	Availability	Connectivity
	Accessibility	Multiple channels availability reachable to disabled
Human Capital	Knowledge and Skills	Education, ICT literacy
	Experience	Duration of E-government use Frequency of e-government use
Governance	Policy and Regulatory framework	Existence
	Transparency	Access to information Openness
	Participation	Involvement
E-government Usage	Information Access	Published information One way communication
	Transaction	Two ways communication Online transactions
	Participatory	Open government interaction
User Experience	Hedonic	Fun, enjoyment, pleasant
	Pragmatic	Efficiency Effectiveness Learnability
	Aesthetic	Visual appealing Clarity and style
Public Value	Services	Satisfaction Importance Fairness
	Outcomes	Reduced corruption Equity
	Trust	Credibility Security Privacy Confidentiality

3.6 Chapter Summary

This chapter offered an account of research strategies employed in the current study to realize the intents of the research. The chapter commenced by identifying three research philosophical paradigms, positivism, interpretivism and pragmatism used in IS research. Likewise, it provided an explanation of epistemological and ontological philosophical assumptions of the research paradigms. The chapter articulated the merits of both qualitative and quantitative approaches. Pragmatism and mixed method research approach form the basis and guidelines for the current study, and a justification was offered.

After assessing the different mixed methods research methodologies, the research methodology adopted by this study was convergent parallel mixed methods. The method was preferred owing to its power to offer diverse and complementary data on the same research problem, thus presenting the researcher with a superior comprehension of the research problem, and its capability to surmount the flaws linked with exclusively using quantitative and qualitative approaches. Triangulation of the results acquired separately from quantitative and qualitative data analysis was another benefit of employing convergent parallel mixed methods research methodology. Using a survey questionnaire and interviews aided in collecting quantitative and qualitative data respectively. The chapter also offered an explanation and procedure of multi-stage stratified sampling techniques that was used to get the sample for the study. This chapter also outlined the exploratory factor analysis and structural equation modeling statistical analyses methods used to analyze quantitative data and thematic analysis methods employed to analyze qualitative data in this study.

CHAPTER FOUR
QUANTITATIVE DATA ANALYSIS

4.1 Introduction

This chapter presents the findings of quantitative data analysis. The chapter consists of four sections. The first section comprises of response rate and respondents' profile. The second section describes the process of preparation, screening and cleaning of the data in terms of missing values, normality and outliers. The third section presents the exploratory factor analysis of measurement items to purify and inspect cross loading of items. The section also comprises reliability and validity tests of each variable. The last section presents the structural equation modeling that comprises assessment of measurement models, structural model and hypotheses testing.

4.2 Response Rate

Out of 400 distributed questionnaires, 315 were returned. This represented a response rate of 78.75 %. As explained in section 3.4.3, the minimum desirable sample size was 255. Hence, the response rate was considered adequate.

4.3 Data Preparation and Screening

Prior to conducting structural equation modeling evaluation, three issues namely *missing data, outliers* and *normality* were addressed (Byrne, 2013).

4.3.1 Missing Data

Structural equation modeling requires data to be complete during analysis of data and hence missing data is a major concern (Kline, 2011). In SEM, Hair et al. (2006) assert that two problems arise as a result of missing data. Missing data minimizes the capacity of the statistical test to imply an association the set of data, and also its results are biased towards estimated parameters.

After investigation the occurrence and the proportion of missing data reveal that no items had less than one percent of missing observations. Specifically, 0.6 percent was the utmost percentage of' missing data. As the value was extremely low, it was deemed tolerable. As recommended by Arbuckle (2003), this research employed regression imputation method

to substitute missing data. To perform regression imputation the values that were missing were approximated by employing regression coefficients where the links between variables were first estimated. The process is provided by SPSS version 20.0.

4.3.2 Outliers

In a specific data set, outliers refer to cases representing values considered lesser or higher from the rest (Kline, 2011). Problematic outliers may result to detrimental consequences on the statistical analysis. There exist two forms of outliers namely univariate and multivariate outliers. An extreme score on one variable, which differs noticeably from the others is referred to as univariate outlier, while odd combination of scores on two or more variables represents multivariate outliers (Tabachnick & Fidell, 2007).

The existence of multivariate outliers in the dataset was verified by inspecting Mahalanobis distance (D2) test. Mahalanobis distance (D2) refers to a "measure of distance in standard deviation units between each observation compared with the mean of all observations" (Field, 2009). Using SPSS 20.0, Mahalanobis distance D2 was performed by conducting regression procedure to all variables. Through inspection, the finding of this research analysis exhibited that the data comprised some outliers. Two cases exceeded the critical value of 99.63, suggesting the presence of multivariate outliers. The two cases were identification number 109 and 232 with a score of 101.17 and 100.17 respectively. The two scores were not high hence, they were retained (Pallant, 2013).

4.3.3 Multivariate Normality

Another fundamental assumption in the universal performance of SEM analyses, and when using AMOS is multivariate normality of data (Byrne, 2013). Multivariate normality implies that every variable is supposed to be considered normally distributed in relative to other variables (Kline, 2011). Any infraction of normality may have an effect on the estimation procedure or the findings interpretation particularly in the analysis of SEM. Such as, it could raise the chi-square value and might probably result in standard errors of parameter estimates and underestimation of fit indices (Hair et al., 2006).

A normal data distribution is supposed to be visually verified by gazing at a histogram of frequencies, or by observing at a normal probability plot output generated by a computer program (Pallant, 2013). Besides the utilization of the probability plot, normality can also be assessed based on skewness and kurtosis values statistical tests. This entails the calculation of z value of ±2.58, which exceeds the critical value at the 0.01 probability level and the ±1.96 critical value at a 0.05 level of error, may as well be used to denote normality (Hair et al., 2006). In this research, as shown in Appendix IV, the skewness values were not greater than 1.5 and kurtosis were greater than 2. The findings of the examination presented rather moderate skewness and moderate non-normality. While the scores indicated that both positive and negative skewness and kurtosis were not extreme.

4.4 Descriptive Statistics

The following section presents demographic study findings.

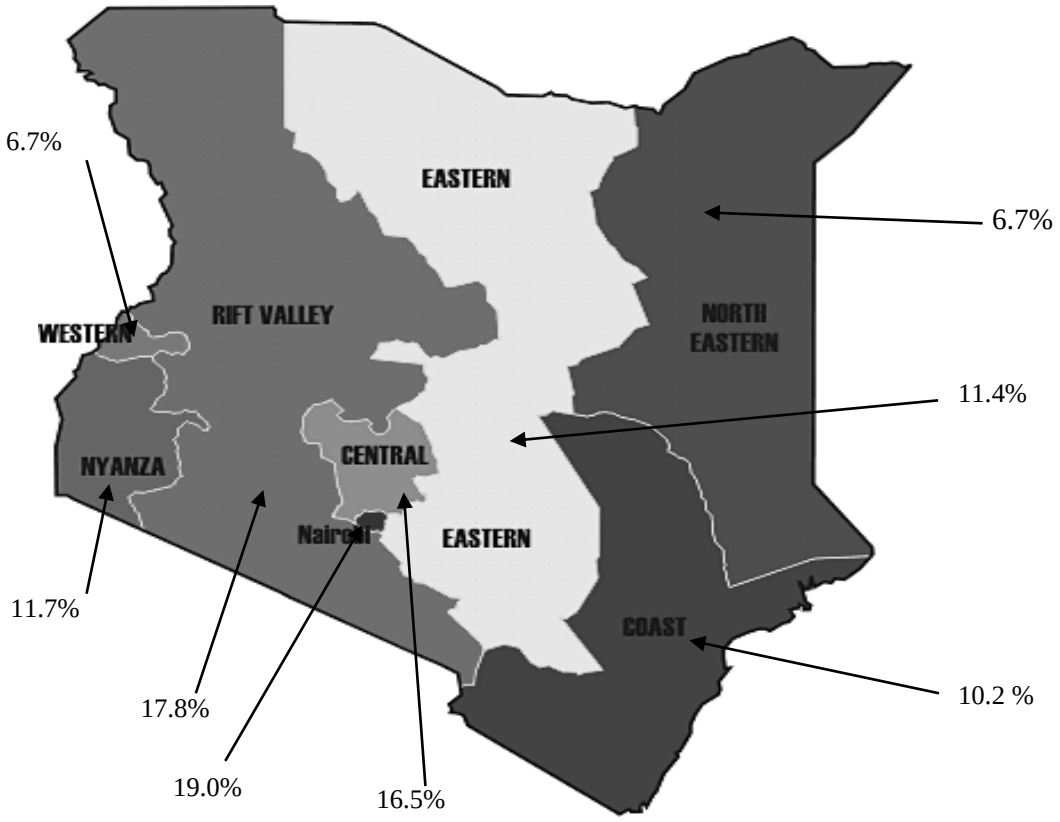
4.4.1 Geographical Distribution

Once the questionnaires were received, they were sorted based on the Kenya counties and then grouped into regions for a larger area of coverage. As indicated in Table 4.1 and Figure 4.1 the respondents represented the different Kenya regions, namely Nairobi (19.0%), Central (16.5 %), Rift Valley (17.8%), Eastern (11.4%), Western (6.7%), Nyanza (11.7), Coast (10.2%) and North Eastern (6.7%). The result of geographical coverage implies that the survey responses represented a wide range of coverage dispersed across the country (see: chapter 3 for sampling method). Therefore, generalizations of the entire results of this research as the representation the opinions of the whole Kenya population are feasible.

Table 4.1: Geographical Distribution of E-government Users in Kenya

Region	Frequency	Percent
Nairobi	60	19.0
Central	52	16.5
Rift Valley	56	17.8
Eastern	36	11.4
Western	21	6.7
Nyanza	37	11.7
Coast	32	10.2
North Eastern	21	6.7
Total	**315**	**100.0**

Figure 4.1: Geographical Distribution of E-government Users in Kenya



4.4.2 Demographic Characteristics of Participants

Table 4.2 exhibits the respondents' demographic characteristics of the questionnaire survey.

Table 4.2: Demographic Characteristics of Participants

Variable	Category	Frequency	Percent
Gender	Male	187	59.4
	Female	128	40.6
	Total	**315**	**100**
Age	Between 18 – 25	72	22.9
	Between 26 – 35	134	42.5
	Between 36 – 45	87	27.6
	Between 46 – 55	21	6.7
	Over 55	0	0
	Missing	1	0.3
	Total	**315**	**100**
Education	Primary school	5	1.6
	Secondary school	78	24.7
	Undergraduate	123	39.0
	Postgraduate	82	26.0
	Others	27	8.6
	Missing	0	0
	Total	**315**	**100**
Professional status	Student	39	12.3
	Self employed	66	20.9
	Employed	199	63.1
	Others	9	28.8
	Missing	2	0.6
	Total	**315**	**100**

As indicated in Table 4.2, majority of respondents were male (59.4%). The differences may be attributed to the fact that, in a society of a developing country like Kenya, digital divide based on gender is very high that favors men. This may also be attributed to cultural and political environment disparities. Also as indicated in Table 4.2 respondents between 26 and 35 years old (46.3 %) were more than half, also more than half possess an undergraduate or postgraduate degree (65.0 %). Also, the results revealed that a bulk of respondents were in employment (63.1%).

4.4.3 E-government Services Used by the Respondents

The respondents were asked to indicate e-government services they have ever used. Table 4.3 exhibits the percentage of respondents along the services they have ever used. The table shows that majority of respondents had used i-Tax systems services at 72.7%%, which may be attributed to the fact that online tax return in Kenya was made mandatory in 2015 (Zaki, 2015). Online application or renewal of driving license followed next at 46.7%. Similarly, this was made mandatory in 2015. Next was online job application at 43.8%; followed closely by Higher Education Loans Board (HELB) services at 41.3%; payment of services such as NHIF, electricity bills was at 26.0%; and use of e-procurement systems at 16.0 %.

Table 4.3: E-government Services Used by the Respondents

Item	Percent
I-tax Systems	72.7%
E-Procurement Systems	16.0%
HELB systems	41.3 %
Online Public Service Job Application	43.8%
Online Driving License Application or renewal	46.7%
Online payment of utility services	26.0%

4.4.4 Mostly Access Point Place for E-government Services

Participants were asked to specify where they mostly access points for e-government services. Table 4.4 shows that 30.5 % of respondents access e-government services from cyber cafes. Those who access point place of e-government services were at offices/workplace and at home were around 24.8% and 23.2% of all participants respectively. 11.7% of the respondents access e-government services at Huduma centers. Those who access e-government services at school/university revealed only 3.5%, while those falling under others category represented 6.3% of the respondents.

Table 4.4: Mostly Access Point Place for E-government Services

Place	Frequency	Percent
At home	73	23.2
In the office	78	24.8
Huduma centre	37	11.7
School/university	11	3.5
Cyber café	96	30.5
Others	20	6.3
Total	**315**	**100.0**

4.4.5 Electronic Devices Owned by Respondents

Participants were also asked to specify the electronic devices they own. As shown in Table 4.5, the results show that the biggest percentage of respondents own mobile phone at 86.7%, followed by the laptops constituting 45.4% of the total respondents. Those who own desktop computer consisted of 27.6%, while those who own tablet or ipad comprised of 12.4 % of the total respondents.

Table 4.5: Electronic Devices Owned by Respondents

Device	Percent
Desktop computer	27.6
Laptops	45.4
Mobile Phones	86.7
Tablet/Ipad	12.4

4.4.6 Device Mostly Used to Access E-Government Services

The respondents were requested to specify the device they mostly use to access e-government services. As pointed out in Table 4.6. 44.4% of the participants were found to access e-government services through desktop computers. This was followed by those who use laptops that constituted (34.6%) of the total respondents, while those who use mobile phones at 18.7% and those who used tablets/ipads at 4.3%.

Table 4.6: Device Mostly Used to Access E-Government Services

Device	Frequency	Percent
Desktop computer	140	44.4
Laptop	109	34.6
Mobile phone	59	18.7
Tablet/ipad	3	4.3
Total	**315**	**100.0**

4.4.7 Frequency and Duration of Using E-Government Services

Table 4.7 provides a summary of the frequency and duration of using e-government services by respondents.

Table 4.7: Frequency and Duration of Using E-Government Services

Variable		Frequency	Percent
Frequency	Almost daily	42	13.3
	At least once a week	112	35.6
	Several times in month	80	25.4
	About once a month	56	17.8
	About once a year	25	7.9
	Total	**315**	**100**
Duration	6 months and less	36	11.4
	Between 6 months and 1 year	37	11.7
	Between 1 years and 3 years	118	37.5
	Between 3 years and 5 years	70	22.2
	5 years or more	54	17.1
	Total	**315**	**100**

Results of participants' based on to the frequency of e-government usage reveal that the highest percentage (35.6%) of participants visits e-government sites at least once per week while the lowest percentage (7.9%) of participants use e-government services once per year. In regard to duration of usage of e-government, the highest percentage (37.5%) of participants had been using e-government services for a period of one year to less than three years, while about 11.4% of respondents had used e-government services for less than 6 months.

4.5 Reliability of Measurement Scales

This study used a questionnaire as an instrument to gather quantitative data to measure variables proposed in the study conceptual framework (chapter 3). Thus, it was necessary for the scale measure of these constructs to be reliable. Reliability means that the measuring results of the questionnaire must be consistent (Neuman, 2006). Scale reliability was examined through assessment of internal consistent and inter-total correlations. This was to ensure that the set of measurement scales accurately and consistently examined the meaning of the constructs.

Internal consistency designates the homogeneity of items consisting of measurement scale (Kline, 2011). Cronbach alpha which is the mostly known and used measure of scale reliability was utilized to inspect internal consistency reliability of the measures. Existing literature provides no universal cut-off point for the alpha coefficient. However, 0.70 is the commonly consented lower limit for Cronbach alpha, even though 0.60 is acceptable (Bryman & Bell, 2015). A very low Cronbach alpha indicates heterogeneity of the variables, thus not representing the construct Table 4.8 presents the initial reliability examination of the measurement scales. The Cronbach alpha coefficients were calculated using SPSS 20.0 along with item-total correlations.

Inter-total correlation (ITC) is defined as the correlation of a variable with composite scores of all variables forming the measures of the constructs (Kline, 2011). Nunnally and Bernstein (1994) posit that for general purpose test, variables within a measure are useful only to the extent that they share a common construct and those that correlate most highly with the total score are the best items. Therefore, ITC analysis was performed to purify and eliminate unnecessary production of more items than could be conceptually defined. The process of item deletion was carried out so as to raise the value of alpha. Deletion of items was based on ITCs of less than 0.30. Variables with a value below 0.30 indicate that the variable is determining something different from the construct as a whole (Pallant, 2013). Starting with items with the lowest ITC, the items were deleted one at a time, and the reliability for the new alpha value was re-tested. Table 4.8 shows the results of reliability tests.

Table 4.8: Reliability of Measurement Scales

Construct	**Coefficient Alpha**
ICT Infrastructure	0.805
Human Capital	0.881
Governance	0.807
E-government Usage	0.791
User Experience	0.751
Services	0.851
Outcome	0.836
Trust	0.821

4.6 Purification of Variables

To answer research objectives in this research the data analysis process consisted of two steps; the first steps entailed purifying data using Exploratory Factor Analysis (EFA) and evaluating the measurement model using Confirmatory Factor Analysis (CFA) model fit and reliability and validity testing. Step two involved testing of hypotheses (structural model) based on satisfactory results of step one. Schumacker and Lomax (2004) advocate for the use of two-step approach as it ensures that constructs are validated before applying the constructs in the structural model as it contributes rigorous testing of the model. The two-step approach was also advocated by Hair et al, (2010) on similar grounds.

4.6.1 Exploratory Factor Analysis

Exploratory factor analysis was principally carried out to probe the underlying patterns of relationships existing amongst the variables that provided operational definitions for manifest variables for SEM and to facilitate the testing for the validity measurement instruments. As recommended by Gaskin (2015) a number of EFA were performed by iterating the factors until pure pattern matrix was reached. EFA was performed in order check if the surveyed items intended measured constructs of the study essentially loaded jointly as anticipated. EFA was also conducted to establish whether extracted factors met reliability and validity criteria and to identify any feasible cross loading.

In performing EFA two major steps were involved. Firstly, was the establishment of the number of factors to be extracted, factor extraction and factor rotation (Hair et al., 2010). Secondly, the factors created in the first step were interpreted (Treiblmaier & Filzmoser, 2010). Principal Components Analysis (PCA) with varimax rotation method was employed to extract factors. According to Pallant (2013), PCA is a technique that summarizes the information embodied within a set of variables in a lesser set of linear combination. PCA was preferred as the primary concern of the researcher was about the minimum number of constructs required to explain the variance with maximum portion pointed out in the initial items set. Osborne and Costello (2005) opine that PCA technique may aid a researcher in deciding if the chosen items cluster on a single or more than one factor. Pallant (2013) further emphasizes the importance of PCA especially if there are three or more items which are selected for estimating one construct.

Factor numbers retained was established by considering the eigenvalues greater than one rule, the percentage of variance criterion (Hair et al., 2010; Pallant, 2013). AS suggested by Osborne & Costello (2005) whenever PCA is chosen for factor extraction, eigenvalues greater than 1.0 should be considered. Orthogonal rotation with varimax rotation was performed to simplify and clarify the data structure. Varimax rotation was preferred as it produces more easily interpretable results (Treiblmaier & Filzmoser, 2010). Catell's scree test was also used to ensure robustness of the solution of factors extracted (Osborne & Costello, 2005). Through Catell's scree test factors above the elbow as detailed by the plotted data indicating of each eigenvalue were retained (Pallant, 2013).

Prior to factor analysis, data was tested for appropriateness for factor analysis. Kaiser Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's test of Sphericity were used. KMO refers to a statistical test that specifies the percentage of variance in the variables which is common variance. Statistical test for examining the existence of associations amongst the variables represents Bartlett's Test of Sphericity. The KMO index varies between 0 and 1. One depicts each variable is perfectly predicted without error by the other variables. Bartlett's Test of Sphericity indicates the significance level of the result of the test. In Bartlett's Test of Sphericity small values of below 0.05 shows that the data do not generate an identity matrix and, therefore, are appropriate for factor analysis (Pallant, 2013).

4.6.2 Exploratory Factor Analysis (EFA) Results

Contextual factors

Contextual factors reflected a reflective construct of second order measured using three first orders reflective constructs namely ICT infrastructure, human capital, and governance. EFA was performed on the measurement scales of these three first order constructs to test reliability and convergent validity prior to CFA analysis.

ICT Infrastructure (ICTF)

The results of the eigenvalues performed for ICT infrastructure items indicated that there was one factor producing a value higher than 1 as indicated in Table 4.9. This was confirmed after a scrutiny of the Cartell's scree test that revealed an apparent break after the first factors as indicated in Figure (a) in Appendix V.

Table 4.9: Eigenvalues of ICT infrastructure (ICTF)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.024	60.484	60.484
2	.709	14.187	74.671
3	.615	12.299	86.970
4	.368	7.359	94.329
5	.284	5.671	100.000

Extraction Method: "Principal Component Analysis".

Drawing from the output of eigenvalues and Catell's scree test, one factor was retained for further investigations. EFA results were refined by performing the orthogonal rotation. The results of factor rotation for ICT infrastructure (ICTF) are presented in Table 4.10. All five items grouped produced a solid ICTF factor exhibiting loadings more than 0.4. Therefore, the five items were retained for subsequent analysis. The findings were clearly supported by the KMO's value of 0.8 signifying that the data was meritorious (Hair et al. 2006), and as well by Bartlett's test of sphericity value which was less than 0.05 validating that the observed variables in the survey data are both dependent and intercorrelated. These results decisively support that EFA can be applied to analyze the data.

Table 4.10: ICTF Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's	
RE1	.869	ICFT	0.823	0.000	0.569
RE2	.854				
AV1	.645				
AV2	.720				
AC1	.653				

Human Capital

Human capital consists of six indicator items SK1, SK3, SK3, SK4, EX1,E2 In the process of examining the reliability of the measurement scales HE1 and HE3 were deleted as they revealed ITCs of less than 0.30. The two items were hence excluded from the EFA process, resulting in the eigenvalues presented in Table 4.11. An inspection of Catell's scree plot as shown in Figure (b) in Appendix V indicates a clear break after the first factor, suggesting the retention of only one factor.

Table 4.11: Eigenvalues of Human Capital

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.949	73.734	73.734
2	.457	11.437	85.171
3	.349	8.714	93.885
4	.245	6.115	100.000

"Extraction Method: Principal Component Analysis".

As indicated in Table 4.11, the eigenvalues analysis reveals only one factor to possess a value of greater than 1, signifying that the extraction for HC items needs to be performed with one factor elucidating 73.734 % of the variance. The results of factor rotation of the EFA for human capital are presented in Table 4.12 indicating the extraction of the items. Four of the HC items extracted into a single factor exhibited loadings of above 0.4. These findings were well supported by the KMO value of 0.8 demonstrating that the data was meritorious (Hair, Black, Babin, Anderson, & Tatham, 2006) and as well by Bartlett's test of sphericity that was below 0.05 verifying observed variables in the survey data are both dependent and intercorrelated. These findings firmly support that EFA can be employed to analyze the data.

Table 4.12: Human Capital Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's	
SK1	0.872	HC	0.799	0.000	0.737
SK2	0.833				
SK3	0.860				
SK4	0.869				

Governance

Governance (GOV) was manifested by its three dimensions; policy and regulatory (GPR), transparency (GTO), and participatory (GPD), the constructs were measured by 4, 3 and 4 items respectively. EFA was used to investigate the dimensionality of GOV drawn from theoretical literature. Consequently, the factor extraction was conducted to all 11 items in single EFA procedure in order to determine the grouped items delineating the contextualized GOV factors for this research. Deriving from the eigenvalues analysis results revealed in Table 4.13, three factors comprising an eigenvalue above 1 were attained. These findings portrayed that the GOV items were to be extracted and assembled into 3 factors explaining 63.094% of the variance. An examination of the Cartell's scree test indicated a clear break following the third factors as indicated in Figure (c) in Appendix V.

Table 4.13: Eigenvalues of Governance (GOV)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.822	34.742	34.742
2	1.837	16.703	51.444
3	1.281	11.649	63.094
4	.969	8.805	71.899
5	.856	7.785	79.684
6	.597	5.429	85.113
7	.520	4.731	89.844
8	.462	4.198	94.042
9	.307	2.788	96.830
10	.244	2.220	99.050
11	.104	.950	100.000

Extraction Method: Principal Component Analysis

Principal component factoring was carried out to scrutinize the factor structure of GOV and all its 11 items. Table 4.14 shows the PCA followed by Varimax rotation utilized for the GOV items.

Table 4.14: GOV Rotated Component Matrix

Item	Component		
	1	2	3
PR1	.854		
PR2	.873		
PR3	.593		
PR4	.569		
TO1		.841	
TO2		.845	
TO3		.604	
PD1			.586
PD2			.921
PD3			.916
PD4		.455	.329

Extraction Method: "Principal Component Analysis".
Rotation Method: "Varimax with Kaiser Normalization".
a. Rotation converged in 5 iterations.

Derived from EFA results illustrated in Table 4.14, GOV construct was measured by parcelled factor 1 (PR2,PR1,PR3, and PR4), factor 2 (TO1, TO2, TO3 and PD4), factor 3 (PD1, PD2, and PD3). The results revealed that one item PD4 of participatory and democracy was dropped because of low primary loadings and high cross-loadings (Osborne & Costello, 2005). After discarding the item, factor analysis was re-computed with the remaining items. The primary factor loadings of retained items, internal reliability and convergent validity analysis are reported in Table 4.15

Table 4.15: Governance Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Cronbach's alpha	Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's		
PR1	0.863	GPR	0.726	0.000	0.754	0.540
PR2	0.868					
PR3	0.618					
PR4	0.530					
TO1	0.863	GTO	0.636	0.000	0.784	0.639
TO2	0.876					
TO3	0.636					
PD1	0.583	GPD	0.578	0.000	0.884	0.689
PD2	0.929					
PD3	0.929					

E-GOVERNMENT USAGE

E-government usage (EGUS) was reflected by the three dimensions of information (IGU) Transaction (TGU) and participatory (TGU). These three dimensions were to be measured with 3, 4, and 3 items, respectively, making up a total of 10 items. EFA was applied to survey the dimensionality of EGUS based on both the citizen-centric e-government maturity and Kenyan context. Factor extraction was applied to all 10 items in one EFA procedure in order to realize the grouped items representing the contextualized EGUS factors. In reference to the eigenvalues analysis results shown in Table 4.16, three factors with an eigenvalue above 1 were obtained. These results suggested that the EGUS items were to be extracted and grouped into three factors elucidating 69.906% of the variance. Supplementary, an inspection of the Cartell's scree test that revealed a clear break after the third factors as indicated in Figure (d) in Appendix V.

Table 4.16: Eigenvalue of E-government Usage (EGUS)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	4.514	45.136	45.136
2	1.338	13.378	58.514
3	1.139	11.391	69.906
4	.649	6.486	76.392
5	.611	6.105	82.497
6	.460	4.598	87.095
7	.423	4.231	91.326
8	.359	3.590	94.916
9	.275	2.755	97.670
10	.233	2.330	100.000

PCA was conducted to examine the factor structure of EGUS and all its 10 items. Table 4.17 shows the PCA followed by Varimax rotation utilized for the EGUS items.

Table 4.17: Rotated Component Matrix

Item	Component		
	1	2	3
IG1	.		0.892
IG2	0.855		
IG3	.		0.847
TG1	0.696		
TG2	0.809	.	
TG3	0.491	0.411	
TG4	0.864		
PG1	0.545	0.489	
PG2		0.868	
PG3		0.853	

Extraction Method: "Principal Component Analysis".
Rotation Method: "Varimax with Kaiser Normalization".
a. Rotation converged in 4 iterations.

As indicated by the EFA results shown in Table 4.18, EGUS was measured by parcelled factor 1 (IG1, and IG3), factor 2 (IG2,TG1, and TG2,TG4), factor 3 (PG2 and PG3). Based on the EFA results, EGUS was to be measured by 3 parcelled factors.

Table 4.18: E-Government Usage Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Cronbach's alpha	Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's		
IG1	0.892	IGU	0.500	0.000	0.746	0.757
IG3	0.847					
IG2	0.855	TGU	0.805	0.000	0.858	0.654
TG1	0.696					
TG2	0.809					
TG4	0.864					
PG2	0.868	PGU	0.500	0.000	0.613	0.741
PG3	0.853					

USER EXPERIENCE

The UX was to be examined by the 10 UX items. The EFA process as indicated in Table 4.19 was employed to all UX items to pinpoint important dimensions for measuring individual UX. Factor extraction was used to all 10 items in single EFA procedure in order to realize the grouped items describing the contextualized UX factors. Based on the eigenvalue analysis results indicated in Table 4.19, three factors with an eigenvalue above 1 were obtained. These findings demonstrated that the UX items were to be extracted and grouped into three factors elucidating 67.897% of the variance. Supplementary, an assessment of the Cartell's scree test that exposed a clear break after the third factors as indicated in Figure (e) in Appendix V.

Table 4.19: Eigenvalues of User Experience (UX)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.946	39.457	39.457
2	1.004	20.044	59.501
3	1.840	8.396	67.897
4	.715	7.145	75.043
5	.543	5.428	80.470
6	.535	5.355	85.825
7	.414	4.143	89.968
8	.391	3.913	93.880
9	.326	3.261	97.141
10	.286	2.859	100.000

Extraction Method: Principal Component Analysis.

PCA was performed to assess the factor structure of UX and all its 10 items. Table 4.20 shows the PCA followed by Varimax rotation utilized for the UX items.

Table 4.20: Rotated Component Matrix

Item	Component		
	1	2	3
XH1		.605	
XH2		.798	
XH3			.842
XH4			.814
XP1	.619		
XP2	.767		
XP3	.699		
XP4	.748		
XP5	.793		
UXP6	.721		

Extraction Method: "Principal Component Analysis".
Rotation Method: "Varimax with Kaiser Normalization".
a. Rotation converged in 3 iterations.

As revealed in Table 4.20, all the 10 items extracted into three factors These findings was well supported by the KMO value that was greater than 0.8 portraying the data to be meritorious (Hair et al., 2010). Moreover, the outcomes of Bartlett's test of sphericity were as well exceeding ($p < 0.001$) affirming the manifest variables in the survey data are both dependent and intercorrelated. These findings inferred that data was suitable for factor analysis.

Further, all items contributed to having more than 0.3 to the factor loading revealing that the factor loadings was adequate in supporting the construct validity of the scales and fit for factor analysis. Subsequently, Inspection of the internal consistency measures was conducted using Cronbach's alpha and all values were found to be greater than the recommended 0.6 threshold of 0.60 (i.e hedonic qualities = 0.706; Aesthetic qualities = 0.801, pragmatic qualities = 0.765) Table 4.21 illustrates the EFA, internal reliability and validity analysis results.

Table 4.21: User Experience Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Cronbach's alpha	Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's		
XH1	.605	UXH	0.706	0.000	0.664	0.501
XH2	.798					
XA3	.842	UXA	0.801	0.000	0.814	0.673
XA4	.814					
XP1	.619	UXP	0.765	0.000	0.846	0.530
XP2	.767					
XP3	.699					
XP4	.748					

Public Value of E-government Services

Public value of e-government services (PVES) was manifested by three dimensions namely; public service value (PSV), public outcome value (POV), and public trust value (PTV), each with 6, 5 and 4 items respectively. The entire PVES dimension items comprised 15 indicators in total. EFA was employed to examine the dimensionality of PVES based on both theoretical literature reviews (chapter 2). As a result, in order to establish the grouped items exhibiting the contextualized PVES factors, the factor extraction was performed in all 15 items in one EFA procedure.

As indicated by the results on Table 4.22 on the eigenvalue analysis, three factors having an eigenvalue greater than 1 were obtained. These results signified that the PVES items were to be extracted and grouped into 3 factors explaining 64.796% of the variance. Further, an inspection of the Cartell's scree test that exposed a clear break following the third factors as indicated in Figure (f) in Appendix V.

Table 4.22: Eigenvalues of Public Value of E-government Services (PVES)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.747	48.193	48.193
2	1.299	9.276	57.469
3	1.026	7.328	64.796
4	.831	5.935	70.731
5	.773	5.524	76.255
6	.575	4.108	80.363
7	.490	3.500	83.863
8	.466	3.326	87.188
9	.385	2.753	89.941
10	.355	2.536	92.478
11	.298	2.127	94.604
12	.277	1.978	96.582
13	.246	1.757	98.339
14	.233	1.661	100.000

Extraction Method: "Principal Component Analysis".

As shown in Table 4.23 the results of the PCA Varimax rotated indicated existence of three significant factors having a significant factor loading on their single items.

Table 4.23: Rotated Component Matrix

Item	Component		
	1	2	3
SV1	.678		
SV3	.720		
SV4	.590		
SV5	.802		
SV6	.819		
OV1		.669	
OV2		.829	
OV3		.772	
OV4		.662	
OV5		.566	
TV1			.636
TV2			.688
TV3			.799
TV4			.721

Extraction Method: "Principal Component Analysis".
Rotation Method: "Varimax with Kaiser Normalization".
Rotation converged in 5 iterations

Besides, all results were endorsed by the KMO measure of sampling adequacy as all items had a value above 0.60, which exhibited inter-correlations that were sufficient, whereas the Bartlett‟s test of sphericity was highly significant ($p < 0.001$). Therefore, revealing that the factor loadings deemed robust in enhancing the construct validity of the scales and fit for factor analysis. Subsequently, the internal consistency of the measures was assessed using Cronbach's alpha and all values were established to be above the recommended value of 0.60 (i.e. service value = 0.853; outcome value = 0.853; trust value = 0.818. Table 4.24 illustrates the EFA, internal reliability and validity analysis results.

Table 4.24: Public Value Results for EFA and Validity Analysis

Item Retained	Factor Loading	Factor Formed	KMO and Bartlett's test		Cronbach‟s alpha	Average Variance Extracted (AVE)
			KMO	Sig. Bartlett's		
SV1	.678	PSV	0.770	0.000	0.853	0.528
SV3	.720					
SV4	.590					
SV5	.802					
SV6	.819					
OV1	.669	TOV	0.815	0.000	0.853	0.500
OV2	.829					
OV3	.772					
OV4	.662					
OV5	.566					
TV1	.636	PTV	0.791	0.000	0.818	0.506
TV2	.688					
TV3	.799					
TV4	721					

4.7 Item Parceling

Prior to conducting the confirmatory factor analysis, item parceling was implemented. Item parceling refers to the creation of composite or average scores across multiple items (Yang, Nay, & Hoyle, 2009). The composite scores are then applied as indicators of latent constructs in SEM analysis instead of individual items. Item parceling was implemented to maintain the ratio of observed indicators to latent constructs equal with the original conceptual framework, strength the results and increase the chances of sufficient model fit (Rocha & Chelladurai, 2012). Item parceling helps reduce model complexity, circumvent violation of normality assumptions, and obtain better model-data fit. Item parceling also is essential particularly when the analysis involves relatively small sample sizes (Shanmugam & Marsh, 2015).

To create item parcels, Bagozzi and Edward (1998) general rules were applied. The first rule requires a set of items to be unidimensional, while the other rule requires items that merge into a single parcel to be at the same level of precision and embody independent observations from an item in a different parcel. Different parceling methods can be used, including aggregating similar or random items (Hall, Snell, & Foust, 1999). Drawing from EFA findings similar items created a parcel. The EFA method was useful as it allowed researchers to determine the parcel numbers as well as items per parcels based on empirical properties (Rocha & Chelladurai, 2012). Moreover, the EFA method also provides a theoretical rationale of the item parcels to some extent as researchers could observe the patterns of relationship between the measured items and the factors. Based on EFA results, item parceling created was related to the latent constructs measured by multidimensional or multifaceted scales namely; governance, e-government usage, user experience and the public value of e-government services.

4.8 Structural Equation Modelling

This section presents phase two of data analysis for quantitative aspect of the study. In this study, SEM was employed to explain relationships among multiple variables. The section outlines the strategy for implementing SEM. As recommended by Anderson and Gerbing (1988) to execute SEM analysis the study used two–step approach. Step one comprised of refining the measurement model. Refining of measurement model involved using theory-driven confirmatory factor analysis (CFA). The step was conducted so as to validate the findings of the EFA and inspect constructs reliability and validity utilized in the conceptual model. The second step involves the analysis of structural model which provides an examination of the degree of the associations between the hypothesized constructs (Byrne, 2013).

4.9 Confirmatory Factor Analysis

CFA refers to a procedure of the SEM family tree (Kline, 2011). CFA is considered as an appropriate method in studied with pre-validated measurement scales. According to Byrne (2013), CFA is the degree to which the hypotheses model adequately describes the data. CFA aims at establishing whether the number of factors and the loadings of observed variables on them complies with what is predicted based on pre-determined theory (Hair et al., 2014).

In this research, CFA was conducted on all the constructs derived from proposed measurement model to examine if all loaded items adequately on the particular construct and if they present an acceptable model fit for the confirmatory model. In some cases, items were discarded based on path loading, variance explained and the standardized residual value. Further, the factor composition was polished based on the ground of the findings from the executed models. CFA was also employed to examine construct validity namely convergent and discriminant validity.

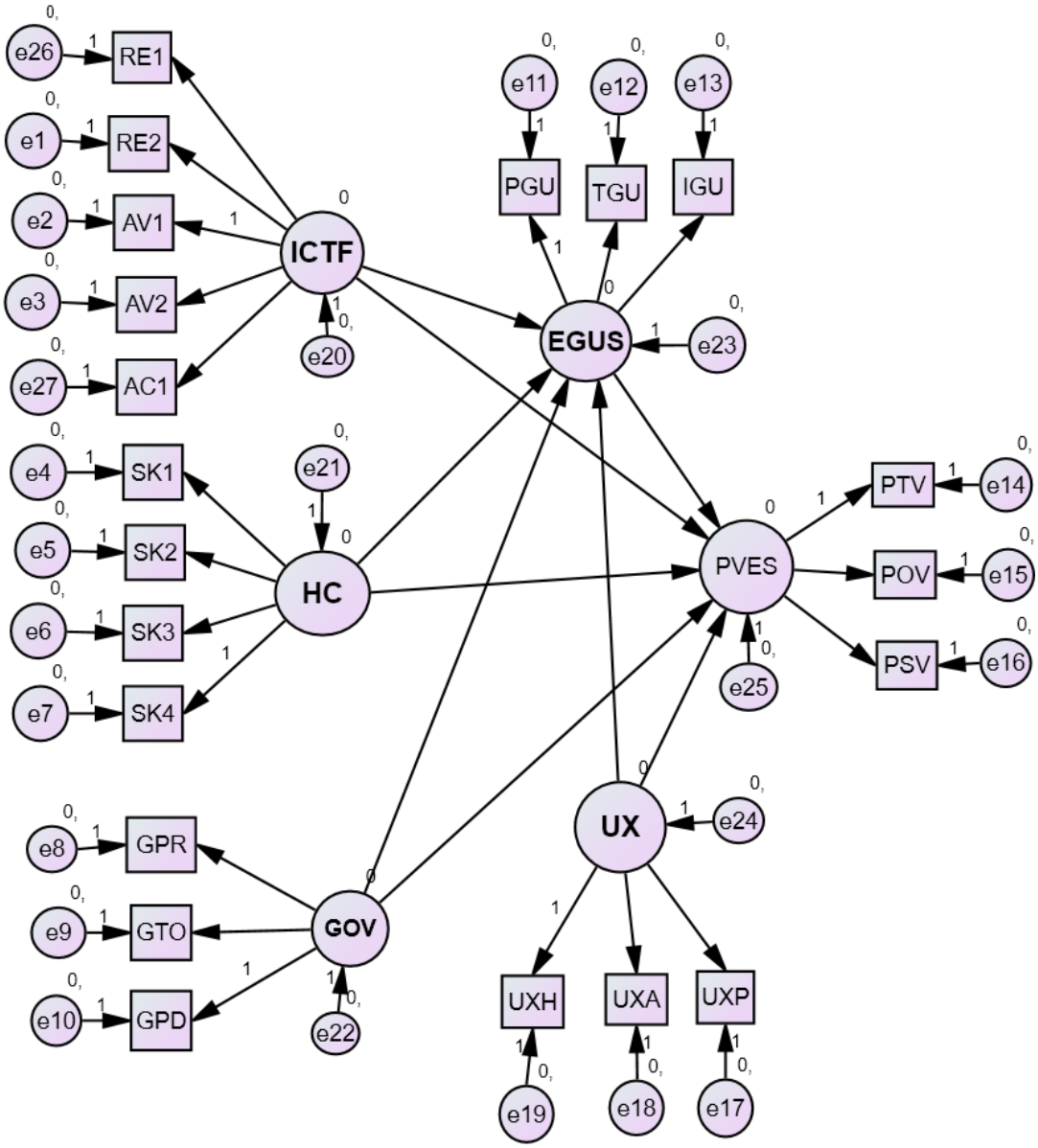
4.10 Measurement Model Evaluation

Measurement model in SEM describes how well the manifest indicators represents measurement instrument for the unobserved constructs (Fornell & Larcker, 1981). The EFA results reported in section 4.6.2 above were used as the starting point for specifying all the measurement models. This research began with estimating and evaluating the full measurement model based on the conceptual framework (chapter 2). The full measurement model, which consist of 6 constructs namely ICT infrastructure, human capital, governance, e-government usage, user experience and public value of e-government services was projected applying maximum likelihood (ML) technique and evaluated using the goodness of fit (GOF) indices provided by AMOS 20.0. Hair et al. (2010) recommend employing The ML assessment method to approximate the difference of observed and covariance matrices where the sample size is greater than 150 (Hu & Bentler, 1999). Table 4.25 present the latent constructs plus the items used in CFA and the measurement model is illustrated in Figure 4.2.

Table 4.25: Latent Constructs and the Items/Parcels used in the Analysis

Latent Construct	Number of Items	Code Name/Parcel
ICT infrastructure (ICTF)	5	RE1,RE2,AV1,AV2,AC1
Human Capital (HC)	4	SK1,SK2,SK3,SK4
Governance (GOV)	3	GPR,GTO,GPD
E-government Usage (EGUS)	3	IGU,TGU,PGU
User Experience(UX)	3	UXH, UXA, UXU
Public Value of E-government Services (PVES)	3	PSV, POV, PTV

Figure 4.2: Initial Measurement Model



4.11 Goodness of Fit Indices

The Goodness of Fit (GOF) indices were employed to establish how well the manifest variables are connected to constructs or latent variables. SEM comprises three categories of fit measure indices. The indices include absolute, incremental and parsimonious fit indices. Hair *et al*. (2010) recommend a minimum of four tests from the three types of fit of measure indices of model fit to test CFA and Structural model. Kline (2010) strongly advocated for the inclusion of X^2/Df, (Comparative Fit Index) CFI, Standardized Root

Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA). Hu and Bentler (1999) recommended two-index presentation format that comprises the SRMR and the Non-Normed Fit Index (NNFI), Turker-Lewis Index (TLI), Parsimony Normed Fit index (PGFI) RMSEA or the CFI. Based on these suggestions, this study uses six measures to assess the measurement model, that is; X^2/df, SRMR, RMSEA, TLI, CFI, and PGFI. Table 4.26 exhibits the recommended values of the GOF indices.

Table 4.26: Recommended Goodness of Fit Indices Values

Type	Index of GOF	Value Recommended	Reference
Absolute fit indices	*X2/df*	<0.2 Reasonable fit up to <0.3	(Kline, 2011)
	SRMR	<0.08	(Byrne, 2013; Schumacker & Lomax, 2004)
	RMSEA	<0.05, Reasonable fit up to 0.08	(Hair et al., 2006)
Incremental fit indices	TLI	Close to 0.95	(Hu & Bentler, 1999; Kline, 2011)
	CFI	>0.90	(Byrne, 2013; Schumacker & Lomax, 2004)
Parsimony fit indices	PNFI	Varies between 0 and 1, with greater values signifying a better parsimonious fit.	(Mulaik et al., 1989)

Using the GOF statistics and indices on Table 4.26, the proposed full measurement model validity was examined. Table 4.27 exhibits the results of the projected measurement model GOF indices.

Table 4.27: Proposed Measurement Model GOF Results

χ^2= 4269.6, p=.000							
	Absolute Fit Indices				**Incremental Fit Indices**		**Parsimony Fit Index**
	df	χ^2/df	RMSEA	SRMR	TLI	CFI	PNFI
Benchmark		0.2	<0.08	<0.08	Close to 0.95	>0.90	Within 0.5
Obtained	1168	3.642	0.96	0.17	0.593	0.613	0.323

As exemplified by the GOF indices, the proposed measurement model failed to fit the data well. X^2/df attained an unacceptable fit of 3.642, Further, RMSEA (0.96), SRMR (0.17), GFI (0.90), TLI (0.593), CFI (0.613) and PNFI (0.323) point out that the model misfit the data as they were not close to the tolerable benchmarks. Hence, modification of the proposed measurement model was required (Byrne, 2013; Hair et al., 2006; Kline, 2011).

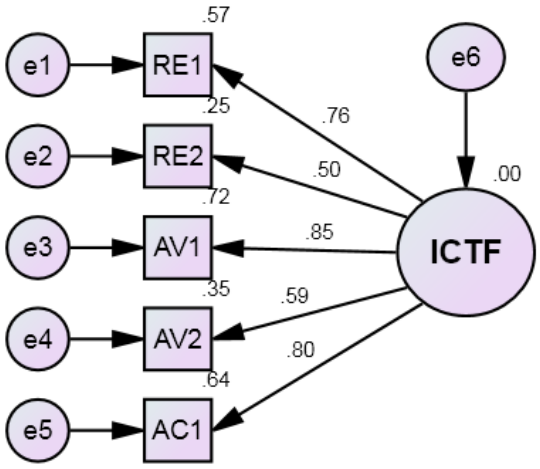
4.12 Modification of the Proposed Measurement Models

Model modification process follows several steps. Firstly, the full measurement model is decomposed into a number of measurement models in form of either one or single-factor congeneric models or multi-factor models (Webster & Fisher, 2001). Secondly, the GOF measures for measurement models are evaluated for their validity tests that include convergent and discriminant validity (Kline, 2011).

4.12.1 Examination of One-factor Congeneric Measurement Models

The elementary structure of measurement models is referred to as one-factor congeneric measurement model. The model depicts the items factor loadings on the solitary construct. Using congeneric measurement methods offers several benefits. Firstly, separate one-factor model offers a more realistic illustration of the data than does the parallel measurement model. Secondly, the congeneric model is considered close to being a test of validity as a well-fitted model means that the indicator variables are all measures of one latent construct. Finally, a fitted congeneric model allows a number of indicators to be reduced into a single composite variable, thus reducing the number of variables in a model and making it more parsimonious (Cunningham, 2008).This research initiated the re-specification process of measurement model by developing six one-factor congeneric measurement models extracted from proposed measurement model. The one-factor congeneric measurement models consisted ICT infrastructure (ICTF), human capital (HC), governance (GOV), e-government usage (EGUS), user experience (UX), and the public value of e-government services (PVES). The researcher began with the one-factor congeneric model for ICT infrastructure which was loaded with five observable variables namely; RE1, RE2, AV1, AV2 and AC1, each variable associated with measurement error. Figure 4.3 exhibits the estimated initial one-factor congeneric measurement model for the ICTF.

Figure 4.3: The Estimated Initial Congeneric Measurement Model for ICTF



An observation of the GOF statistics one-factor congeneric measurement model for ICT infrastructure reflected all five of the observed items RE1, RE2, AV1, AV2 and AC1 measured this latent factor in a poorly fitted model. The model embodied by the $X2/df$ value of 3.173 that is above suggested value range of (<2.0) or reasonable <3.0. The Bollen-Stine *P* value of 0.001which was below 0.05, the sanction value (Byrne, 2013). In addition, the value of RMSEA was 0.085 which was greater than the sanctioned value of 0.05 or reasonable <0.08. Therefore, despite SRMR (0.0290), TLI (0.963), CFI(0.981), PNFI (0.487) were well within the recommended values of <0.05, <0.08, >0.95, >0.90 and within 0.5 respectively, hence the model required modification.

Several diagnostic measures were performed to purify the model. The diagnostic measures performed were "standardized factor loading" (SFL), "standardized residuals" (SR) and "modification indices"(MI) (Byrne, 2013; Kline, 2011). SFL values exemplify how precisely discrete items can elucidate a factor. Any item the value is below 0.5 of SFL denotes that the item fails to explicate the factors as expected. Consequently, an item like that one needs to be discarded (Hair et al., 2010). SR values define the variation between the observed and the approximated terms of covariance , while MI is conceptualized as an X^2 statistic with one degree of freedom (*df*) (Kline, 2011). Table 4.28 summarizes the accepted values for SFL, SR and MI for assessment of measurement model suggested by Hair et al. (2010).

Table 4.28: Assessment of Measurement Model

Measures	Range	Action taken in the present study
Standardized Factor Loading (SFL)	SFL< |0.5|	Considered too low and candidate for deletion
	|0.5| <SFL<|1.0|	Accepted range
	SFL>|1.0|	Out of study
Standardized Residual (SR)	SR<|2.5|	No issue
	|2.5|<SR<|4.0|	Need some attention for the item
	SR>|4.0|	Intolerable degree of error that results to discarding the upsetting items
Modification Indices	MI>10.0	The model need an improvement

Source: (Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R., p. 713)

Diagnostic statistics for ICTF one-factor congeneric model that was achieved through the output from AMOS was conducted first. The model diagnoses analysis commenced with probing the Standardized factor loadings. Figure 4.3 and Table 4.29 shows SFLs indicator variables for RE1, RE2, AV1, AV2 and AC1 as 0.76, 0.50, 0.85, 0.59 and 0.80 respectively. All indicators had SFL value of greater than 0.5 which is above the recommended cut-off point expect RE2 with was 0.50, hence a candidate for deletion.

Table 4.29: Standardized Factor Loadings for ICT Infrastructure (ICTF)

Variable Indicator	Latent factor	Estimate of SFL
RE1	ICTF	0.76
RE2	ICTF	0.50
AV1	ICTF	0.85
AV2	ICTF	0.59
AC1	ICTF	0.80

By identifying RE2 item a candidate for deletion, modification indices values were checked to verify deletion. Examination of modification indices indicates a correlation between the errors e1 and e2. However, drawing on recommendations by Hair et al (2010), researchers are not supposed to re-specify the model based on the errors as result of correlation. Hence, an assessment of SR requires to be conducted as another diagnostic measure. As displayed in Table 4.30 standardized residual of all the indicator variables met the recommended SR value (Schumacker & Lomax, 2004). Consequently, in reference to MI, (error of e2 correlates with errors of e3), to re-specify the model, the two errors were co-varied.

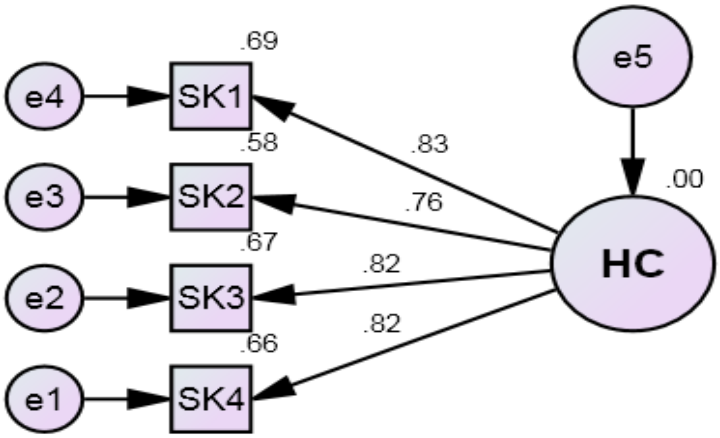
Table 4.30: The Standardized Residuals among Indicator Variables for ICTF

	RE1	RE2	AV1	AV2	AC1
RE1	.000				
RE2	.665	.000			
AV1	-.142	-.175	.000		
AV2	1.169	.593	-.659	.000	
AC1	-.429	-.515	.401	-.190	.000

The re-specified model statistics of GOF discloses that the altered one-factor congeneric measurement model of ICTF poorly fitted the data as illustrated by an *X*2/*df* of 6.201 and 0.002 *P* value. Other value indices included SRMR at 0.0309, RMSEA at 0.129 and values of CFI, TLI and NGFI that were extremely close to 1. The compelled the deletion of RE2. The above process was repeated to re-examine the model. The results of re-specification exemplified that SFLs for indicator variables RE1, AV1, AV2 and AC1 were larger than the recommended value of 0.5, for MI signified no correlation among the error terms. Also, the SR values revealed AV1 had a low MI value of -0.005, hence AV1 was discarded. Thereafter, re-specification of the model goodness of fit statistics disclose that the adjusted one-factor congeneric measurement model of ICTF perfectly fitted the data as demonstrated by an *X*2/*df* of 0.861 and 0.353 *P* value, while RMSEA value was 0.000 and the values of CFI, TLI and NGFI were extremely close to 1 and SRMR value of 0.0101.

Evaluation of the GOF statistics one-factor congeneric measurement model of human capital (HC) construct was the next to be conducted. Figure 4.4 displays the human capital (HC) one-factor congeneric measurement model. Model fit test of the model revealed lack of sufficient validity. The model embodied by the value of *X*2/*df* which equaled 12.722 thus was above the sanctioned value (3.0), with 0.001 as the Bollen-Stine *P* value which was also less the sanctioned value of 0.05. The RMSEA value was at 0.193 which was higher that the suggested value of 0.08. Also, as indicated by other GOF measures SRMR (0.308), TLI (0.896), CFI (0.657) and PNFI (0.322) signify that the model misfit of the data as they were not close to the acceptable benchmarks.

Figure 4.4: The Estimated Initial Congeneric Measurement Model for HC



Diagnostic statistics for HC one-factor congeneric model was achieved through AMOS text outputs. The diagnostic process of the model commenced with probing the SFLs. As depicted in Table 4.31 and Figure 4.4, SFLs 0.83, 0.76, 0.82 and 0.82 represented indicator variables SK1, SK2, SK3, and SK4 respectively. All indicators had SFL value greater than 0.5 which were above the recommended cut-off point.

Table 4.31: The Standardized Factor Loadings for Human Capital (HC)

Variable Indicator	Latent factor	Estimate of SFL
SK1	HC	0.83
SK2	HC	0.76
SK3	HC	0.82
SK4	HC	0.82

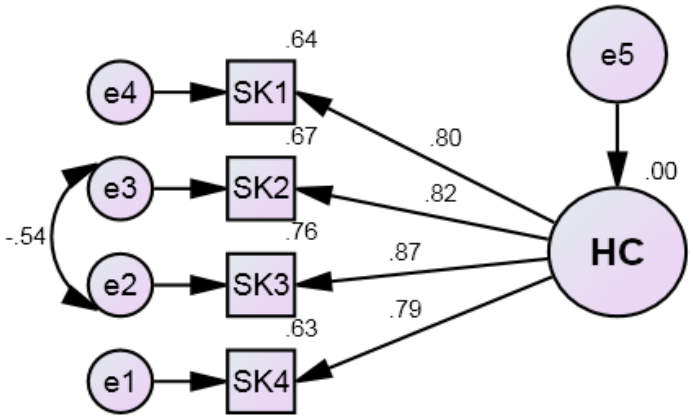
After examination of MI and SR, MI indicated a correlation between the errors e2 and e3. However, as shown in Table 4.32 SR revealed all the indicator variables met the recommended SR value (Schumacker & Lomax, 2004). Therefore, as indicated in MI, the error of e2 correlates with errors of e3, the two errors were co-varied and the model was re-specified.

Table 4.32: The Standardized Residuals among Indicator Variables

	SK1	SK2	SK3	SK4
SK1	.000			
SK2	.103	.000		
SK3	.515	-.907	.000	
SK4	-.600	.810	.082	.000

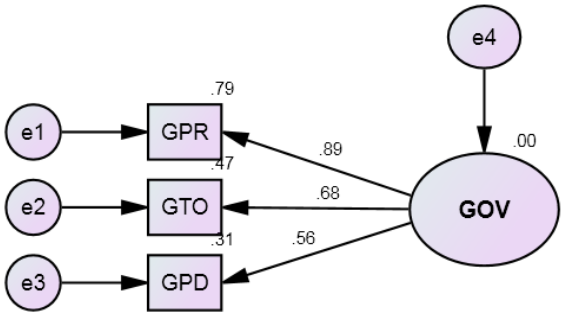
The re-specified model goodness of fit statistics disclosed the adjusted measurement model for HC sufficiently fits the data epitomized by an *X*2/*df* of 2.938 and by a *P* value of 0.887, while SRMR and RMSEA values were 0.0122 and 0.079 respectively. The CFI, TLI and PNFI values were very close to 1. Figure 4.5 displays the HC construct re-specified measurement model.

Figure 4.5: The Re-Specified Congeneric Measurement Model for HC



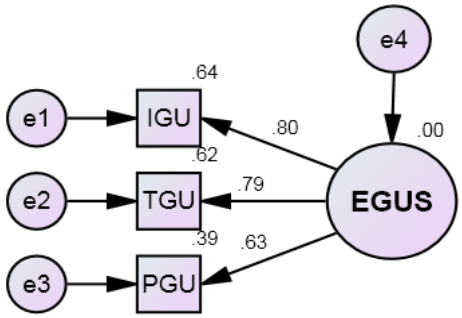
Purification of one-factor congeneric measurement model for governance (GOV) was subsequently conducted. Three item parcels were adopted as latent construct indicators of EGUS. The parcels were labeled as GPR (representing information policy and regulation), GTO (representing transparency) and GPD (participation). As displayed in figure 4.6 the SFLs of the GPR, GTO and GPD parcels met the minimum condition of 0.5. The loading for the parcel were 0.89, 0.68 and 0.56 respectively. The measurement model provided a perfect data fit (χ2/df equaled 0.495, TLI equaled 1.000, CFI equaled 1.000. PNFI equaled 0.333 and RMSEA equaled 0.000).

Figure 4.6: The Estimated Initial Congeneric Measurement Model for GOV



After GOV measurement model specification next was one-factor congeneric measurement model for e-government usage (EGUS). Three item parcels were applied latent construct indicators of EGUS. The parcels were labeled as IGU (representing information government usage), TGU (representing transaction government usage) and PGU (participatory government usage). As displayed in figure 4.7. The SFLs of the IGU, TGU and PGU parcels met the minimum prerequisite of 0.5. The loading were parcel 0.80, 0.79 and 0.63 respectively. The measurement model offered a perfect data fit (χ2/df equaled 0.421, CFI equaled 1.000, TLI equaled 1.000, PNFI equaled 0.245 and RMSEA equaled 0.000).

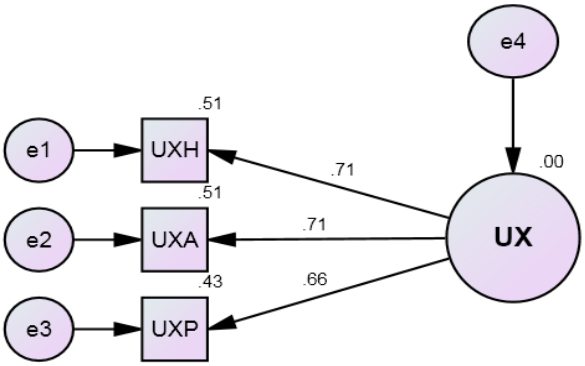
Figure 4.7: The Approximated Congeneric Measurement Model for GOV



Then, one-factor congeneric measurement model for user experience (UX) was next estimated. UX was measured using three parcels grouped as hedonic, aesthetic and pragmatic qualities. This was based on literature review (chapter 3), and supported by EFA results. The observed indicators in the model had only three items and hence the model was just- identified. Therefore, to test the model fit, equality constraints was imposed on one of the factors construct to increase the degree of freedom. As displayed in figure 4.8 the UXH, UXA and UXP parcels SFLs met the minimum precondition of 0.5. The loading

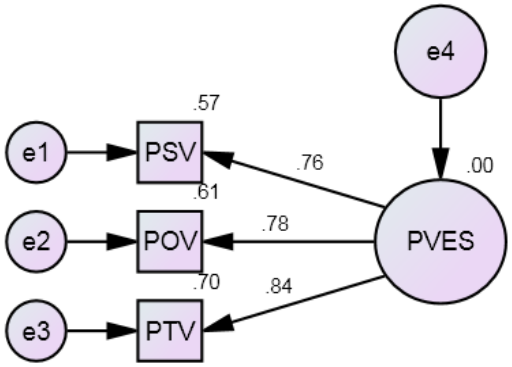
were parcel 0.71, 0.71 and 0.66 respectively. The measurement model presented a moderate data fit (χ2/df = 2.102, p= 0.247 CFI = 0.994, TLI = 0.983, PNFI =0.330, RMSEA = 0.059 and SRMR = 0.0190).

Figure 4.8: The Estimated Initial Congeneric Measurement Model for UX



Finally, one-factor congeneric measurement model for the public value of e-government services (PVES) was estimated. PVES measurement model was measured using three parcels grouped as service value (PSV), outcome value (POV) and trust value (PTV). This was supported by EFA results and prior literature. The model also was just- identified as the observed indicators in the model had only three items. Thus, equality constraints were imposed in one of the factor loadings construct As displayed in figure 4.9 the standardized factor loading of the PSV, PTV and PTV parcels met the least requisite of 0.5. The loading of the parcels was 0.76, 0.78 and 0.84 respectively. The measurement model offered a moderately data fit (χ2/df = 2.102, P=0.147, CFI = 0.994, , TLI = 0.983, , PNFI , 0.331and RMSEA = 0.059).

Figure 4.9: The Estimated Initial Congeneric Measurement Model for PVES



4.12.2 Validity Assessment of the Measurement Models

After measurement models fit, it is recommended CFA results be validated by examining construct validity (Markus, 2012). In SEM the common broadly established forms of validity for CFA findings are convergent and discriminant validity.

4.12.2.1 Convergent Validity

Convergent validity was assessed by AVE, factor loadings of the construct and construct reliability (CR) estimation (Byrne, 2013). Several researchers have debated on the cutoff point of standard factor loadings for convergent validity. On one hand, Steven (1992) advocates for applying a cut-off if 0.4 for interpretative purposes, irrelevant of sample size. On the other hand, Tabachnick and Fidell (2007) concur with Comrey and Lee (1992) in recommending using more stringent cut-off starting from 0.32 as *poor*, 0.45 as *fair*, 0.55 as *good*, 0.63 as *very good* and 0.71 as *excellent*. Hair et al (2010) suggested factor loading cut off to be based on sample size starting from cut-off 0.3 for 350 sample size needed for significance, 0.35 for 250 and 0.40 for a sample of 200 and more 0.5 for sample size less than 120. The sample size of this research was 315 and therefore the cut-off point greater than 0.4 was desirable (Byrne, 2013; Urbach & Ahlemann, 2010).

Average variance estimated determines the indicators total of variance explained by the latent construct (Markus, 2012). To compute AVE the SFLs total squared is divided by the items number (Bryman & Bell, 2015). Convergent validity recommended AVE is at 0.5 or more is satisfactory for every latent construct (Hair et al., 2010). Table 4.33 reveals factor loadings for all constructs were statistically significant and as SFLS were above 0.40. AVE was higher than 0.5 except for user experience which was 0.481. Also, construct reliability for all the constructs was above 0.50; thus, the measures demonstrated convergent validity.

Table 4.33: Convergent Validity of Measurement Models

Construct	Item	Factor Loading	AVE	CR
ICT infrastructure (ICTF)	RE1	0.871	0.527	0.812
	AV1	0.629		
	AV2	0.554		
	AC1	0.808		
Human Capital (HC)	SK1	0.803	0.677	0.893
	SK2	0.821		
	SK3	0.871		
	SK4	0.793		
Governance (GOV)	GPR	0.887	0.522	0.760
	GTO	0.683		
	GPD	0.559		
E-government usage (EGUS)	IGU	0.628	0.554	0.784
	TGU	0.790		
	PGU	0.802		
User Experience (UX)	UXH	0.656	0.561	0.736
	UXA	0.713		
	UXP	0.711		
Public Value of E-government Services (PVES)	PSV1	0.836	0.628	0.835
	POV	0.783		
	PTV	0.757		

4.12.2.2 Discriminant Validity

Discriminant validity refers to as "the degree to which two conceptually similar concepts are distinct" (Hair *et al*., 2010, p.125). Discriminant validity was examined applying a method recommended by Fornell and Larcker (1981), which is more thorough and conservative. The method compares AVE for each construct with the association approximation between constructs (Byrne, 2013). Discriminant validity is evident when AVE square root for a construct is larger than the correlation approximation between that construct and the entire constructs (Byrne, 2013; Kline, 2011). Table 4.34 presents results of AVE square root and correlation approximation between constructs.

Table 4.34: Square Root of AVE and Inter-Construct Correlations of Constructs

	ICTF	HC	GOV	EGUS	UX	PVES
ICTF	**0.726**					
HC	0.133	**0.823**				
GOV	0.358	0.101	**0.722**			
EGUS	-0.027	0.180	-0.136	**0.744**		
UX	0.225	0.222	0.335	0.194	**0.692**	
PVES	0.270	0.023	0.576	-0.136	0.572	**0.792**

As revealed in Table 4.34, each construct AVE square root was greater than the association between that construct and other constructs. Therefore, all the constructs in the research exemplified dissimilar concepts and there as there were no issues in regard to discriminant validity.

4.13 Structural Model

The structural model in SEM represents the associations among the latent constructs (Kline, 2011). It spells out the way through which certain constructs directly or indirectly influence adjustment in the values of particular other constructs in the model (Byrne, 2013). In other words, the structural model is concerned with how constructs are associated with each other and are used for hypotheses testing. In the present research, the contemplated structural model consisted of six latent constructs, of which four are exogenous (ICT infrastructure (ICTF), human capital (HC), governance (GOV) and user experience (UX) and two are endogenous (e-government usage (EGUS) and public value of e-government services (PVES).

Before presenting and discussing outcomes of the current research hypotheses, assessment of the structural model overall fit was conducted (Kline, 2011). The six GOF indices employed to test the measurement models were also utilized to examine the structural model. Hair *et al*. (2010) recommend a minimum of four tests of model fit indices should be applied to inspect the structural model. From the outcomes, the structural model fit indices demonstrated a moderately good fit with the data (χ2/df = 2.298, RMSEA = 0.064, SRMR = 0.814, CFI = 0.928, TLI = 0.918, PNFI =0.758), hence supporting the basic theoretical model of this study.

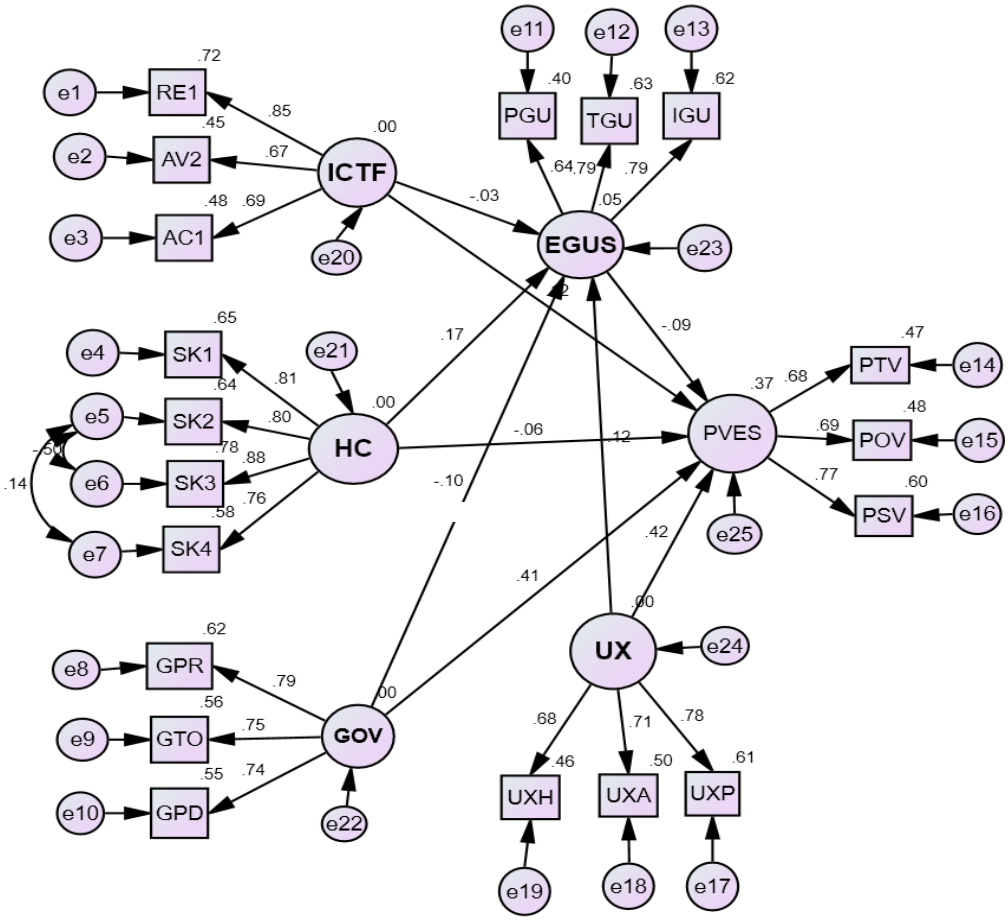
4.14 Hypotheses Testing

The following section presents findings of the causal research hypotheses underlying the proposed model. The section presents direct, mediating, and moderating relationships that were examined.

4.14.1 Hypotheses Testing: Direct Relationships

The direct research hypothesis testing was conducted by analyzing the path significance of each relationship. In hypothesis testing, the critical ratio (CR) or t-value is the most important test (Markus, 2012). The CR is computed by taking the weight of un-standardised regression and divides it by SE. If the CR is over ±1.96 and the p-value of (≤.05), the association is considered significant (Byrne, 2013). Figure 4.10 presents the path coefficients of all relationships in the structural model

Figure 4.10: Structural Model Diagram with Path Coefficients



4.14.1.1 ICT infrastructure and E-government Usage

The first objective of this study was to establish the relationship between of contextual factors and e-government usage in Kenya. In order to ascertain the relationships of the constructs under study, a number of factors from existing literature were identified as influencing the e-government usage. The factors studied in this research were ICT infrastructure, human capital and governance depicting $H0_{1a}$, $H0_{1b}$ and $H0_{1c}$ respectively.

Null hypothesis $H0_{1a}$ stated that there was no correlation between ICT infrastructure and e-government usage. The results demonstrated a negative and no significant path from ICT infrastructure to e-government usage (β = - 0.032, t-value = -0.361, p >0.05). Thus, the study failed to reject the null hypothesis. Null hypothesis H_{1b} investigated the association between human capital and e-government usage. Further, the results demonstrated a positive and significant path from human capital to e-government usage (β = 0.169, t-value= 3.206, p <0.05). Thus, the null hypothesis was rejected. Human capital was therefore confirmed to be an antecedent to the e-government usage. Null hypothesis $H0_{1c}$ stated that there was no relationship between human capital and e-government usage. Also, according to findings governance effect on e-government usage was positively and statistically significant. The path coefficient was β = 0.111 at p< 0.05 significance level and t-value = 4.278. This implies that the governance positively influences e-government usage. Thus, the null hypothesis was rejected.

4.14.1.2 Contextual Factors on Public Value of E-government Services

The second objective of this study was to establish the relationship between contextual factors (ICT infrastructure, human capital, governance) and on the public value of e-government services in Kenya. Similarly, so as to ascertain the relationships of the constructs under study, three null hypotheses $H0_{2a}$, $H0_{2b}$ and $H0_{2c,}$ that represented ICT infrastructure, human capital and governance respectively were tested.

Null hypothesis $H0_{2a}$ stated there was no positive association between ICT infrastructure and the public value of e-government services. The results demonstrated a positive and no significant path from ICT infrastructure to the public value of e-government services

(β = 0.116, t-value 1.391, p >0.05). Thus, the study failed to reject the null hypothesis. Null hypothesis $H0_{2b}$ stated that there was no association between human capital and the public value of e-government services in Kenya. The results demonstrated a negative and significant path from human capital to the public value of e-government services (β = -0.057, t-value = -4.245, p <0.05). Thus the null hypothesis was rejected. Human capital was therefore confirmed to be an antecedent to the public value of e-government services. Null hypothesis $H0_{2c}$ stated there was no effect of governance on the public value of e-government services. The outcomes demonstrated statistically significant positive path from governance to public value of e-government services (β = 0.408, t-value 6.068, p <0.05). Hence, the null hypothesis was rejected. Governance was therefore confirmed to be an antecedent to the public value of e-government services.

4.14.1.3 E-government Usage and Public Value of E-government Services

Null hypothesis 3 stated there was no link between e-government usage and the public value of e-government services. It was conjectured of the existence of a positive association between e-government services usage derived from stages of maturity of e-government services and the public value of e-government services. The results demonstrated negative significant path from e-government usage to the public value of e-government services (β = 0.092, t-value = 7.582, p < 0.05). Thus the null hypothesis was rejected.

4.14.1.4 User Experience and Public Value of E-government Services

Null hypothesis 4 stated that existence of no association between user experience and public value of e-government services. The results demonstrated a positive and significant path from user experience to e-government usage (β = 0.422, t-value = 6.050, p <0.05). Thus, the null hypothesis was rejected. Table 4.35 summarizes the hypotheses test results for direct relationships.

Table 4.35: Direct Structural Model Hypotheses Test Results

Null Hypothesis	Hypothesis relationship	Estimate	Standard Error	Critical Ratio/ t-value	P-value
$H0_{1a}$	ICTF→EGUS	- 0.032	0.083	-0.361	0.645
$H0_{1b}$	HC→EGUS	0.169	0.051	3..206	0.009**
$H0_{1c}$	GOV→EGUS	0.111	0.026	4.278	0.005*
$H0_{2a}$	ICTF→PVES	0.116	0.085	1.391	0.624
$H0_{2b}$	HC→ PVES	-0.057	0.012	-4.245	0.025*
$H0_{2c}$	GOV→ PVES	0.408	0.046	6.068	0.000**
$H0_3$	EGUS→PVES	0.092	0.012	7.582	0.035*
$H0_4$	UX→PVES	0.422	0.056	6.050	0.000**

**p< 0.05, **p < 0.01*

4.14.2: Hypotheses Testing: Mediating Relationships

The fourth objective was to establish the mediating effect of e-government usage on the relationship between contextual factors (ICT infrastructure, human capital, governance) and the public value of e-government services. To achieve this objective the hypothesis was formulated in null as $H0_{4a}$, $H0_{4b}$ and $H0_{4c}$ which represented ICT infrastructure, human capital and governance respectively.

As mentioned in section 3.4.9.2, this study used test with bootstrapping to conduct mediation analysis. The study performed a Sobel test with bootstrapped standard errors using 2000 re-sampling. Table 4.36 presents the findings of the Sobel test Results.

Table 4.36: Sobel Test Results

Indirect effect	Sobel Test	P-Value	Mediating effect
ICTF→EGUS→PVES	0.174	0.064	No mediation
HC→EGUS→PVES	-1.898	0.000**	Partial
GOV→EGUS→PVES	1.681	0.000**	Partial

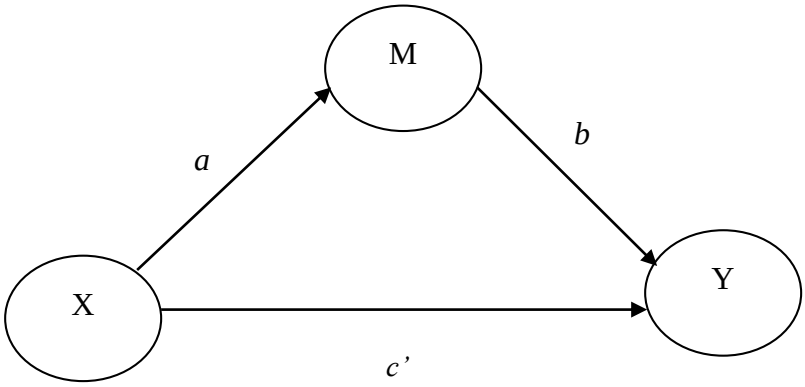
***p < 0.01*

As exhibited in Table 4.36, the outcomes confirmed that e-government usage had a partial intervening effect on the correlation between contextual factors human capital and governance and the public value of e-government services (Sobel test = -1.898, $p < 0.05$) while (Sobel test = 1.681, $p < 0.05$) respectively. Accordingly, e-government usage had no intervening effect on the relationships ICT infrastructure and the public value of e-government services (Sobel test = 0.174, $p > 0.05$).

4.14.2:1 Proportion of Mediation of Relationships

Figure 4.11 represents a basic mediation model, where X represents the independent variable and Y the dependent variable. M represents the mediator variable. In the figure *a* from the independent variable represents the standardized path coefficient to the intervener, *b* stands for the standardized path coefficient from the intervener to the dependent variable and *c* stand for the standardized path coefficient from the independent to the dependent variable.

Figure 4.11: Mediation Model



The proportion of mediation can be established by evaluating the extent of the indirect to total path coefficients using the following equation (Iacobucci, Saldanha, & Deng, 2007).

$$\text{Proportion of mediation} = \frac{a\ X\ b}{(a\ X\ b)+c\prime}$$

Using the proportion of mediation formula above, Table 4.37 presents the findings of testing for the ratio of mediation in the present research. The table demonstrates the standardized path coefficient values from ICTF, HC and GOV to EGUS, and the standardized path coefficients from EGUS to PVES of ICTF, HC and GOV in Figure 4.10. The table as well illustrates the proportion of indirect-to-total effects.

Table 4.37: Proportion of Mediation Results

1	2		3	4		5
INDIRECT EFFECTS	**HC→ EGUS (*a*)**	**GOV→ EGUS (*a*)**	**EGUS →PVES (*b*)**	**HC→ PVES (*c'*)**	**GOV→ PVES (*c'*)**	**RATIO OF INDIRECT-TO-TOTAL EFFECTS**
HC→EGUS→PVES	0.187		-0.149	-0.125		-0.728
GOV→EGUS→PVES		-0.155	- 0.149		0.325	0.066

As exhibited in Table 4.37, the standardized path coefficients from HC and GOV to EGUS and from EGUS to PVES are significant. The coefficient linked with the indirect path of HC through EGUS to PVES equate to -0.028 i.e (0.187 × -0.149), and as indicated in Table 4.36 was notably not equal to zero (Sobel test =-1.898, $p < 0.05$). Table 4.37 also reveals that the proportion of indirect to total effect amount to 0.183 i.e [- 0.028/ (-0.028 + -0.125)]. This indicates that 18.3 percent of the public value of e-government services variance explicated by both human capital and e-government usage was explained by the indirect path by e-government usage, whilst the other part of the public value of e-government services variance explained by both human capital and e-government usage was explained by the direct path. This signified partial mediation and the direct path was prevalent.

Similarly, Table 4.37 reveals that both the standardized path coefficient from governance to e-government usage and from e-government usage to public value of e-government services to be considerable. The coefficient linked with governance indirect path through e-government usage to public value of e-government services amount to 0.023 [-0.155 x -0.149], and (as indicated in Table 4.36) was notably not the same as zero (Sobel test =1.681, $p < 0.05$). Table 4.37 as well revealed the proportion of indirect to total effect amount to 0.066 i.e [0.023 / (0.023 + 0.325)]. This indicated that 6.6 percent of the public value of e-government services variation explicated by both governance and e-government usage was explained by the indirect path through e-government usage, while the other part of the public value of e-government services variance accounted for by both governance and e-government usage was explicated for by the direct path. Hence, there was partial mediation; however, the direct path was predominated.

4.14.3 Hypotheses Testing: Moderating Effects

The sixth objective was to establish the moderating effect of user experience on the correlation between e-government usage and the public value of e-government services. To achieve the objective, hypothesis six was formulated in null as $H0_6$ which stated that user experience has no moderating effect on the relationship between e-government usage and the public value of e-government services.

As stated in section 3.4.9.3 testing of moderation was performed using the orthogonalizing approach. To probe the user experience moderating effect on the association between EGUS and PVES, from 2 sets of indicators namely EGUS and UX, nine product terms were constituted. Particularly, 3 indicators of EGUS (igu, tgu, and pgu), and 3 indicators of UX (uxh, uxa, and uxp) were formed. As a result, the following 9 product terms were created:

iguuxh = igu* uxh

iguuxa = igu * uxa

iguuxp = igu *uxp

tguuxh = tgu * uxh

tguuxa = tgu*uxa

tguuxp = tgu*uxp

pguuxh = pgu*uxh

pguuxa = pgu*uxa

pguuxp = pgu*uxp

Then every emerging nine product terms uncentered were subsequently independently regressed onto the indicators of first-order effect of the variables. For instance, iguuxh = b0 + b1igu + b2tgu + b3pgu+ b4uxh + b5uxa + b6uxp. Where igu, tgu, and pgu embody the first-order indicators for the EGUS variable, and uxh, xha, and uxp correspond to the first-order indicators for the UX variable. The regression residual was afterward stored and applied as interaction indicator of the variable. This process was replicated for all the nine uncentered product terms.

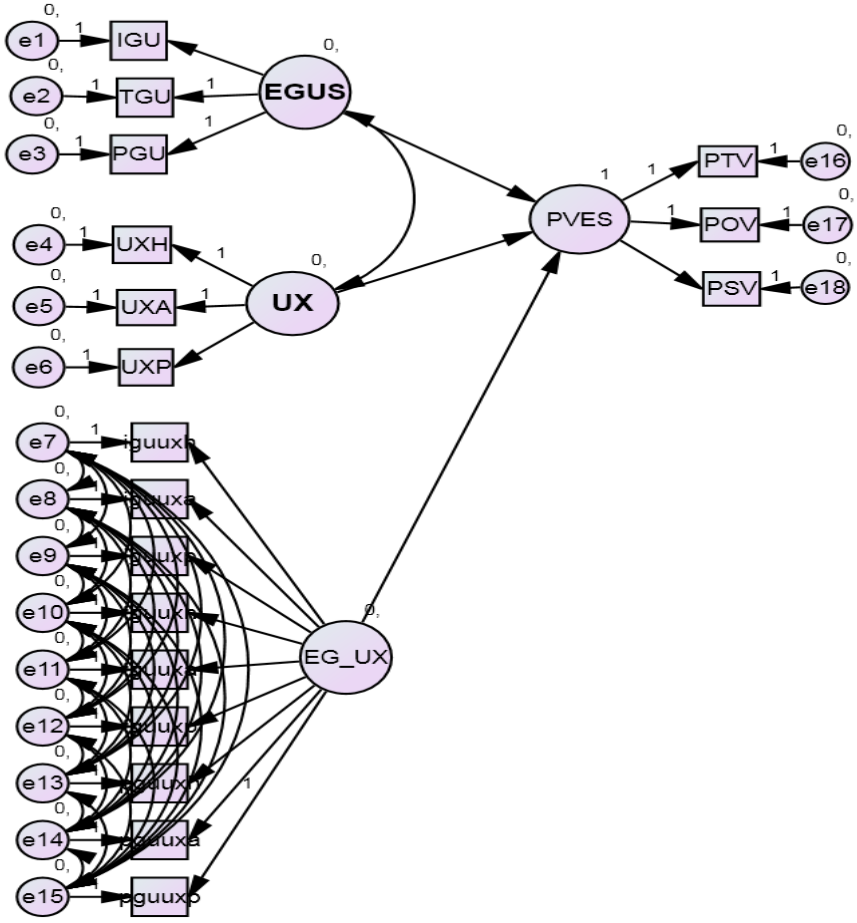
The nine orthogonalized product terms were afterward incorporated as single latent interaction variable indicators. Notably was that a unique variance was similar in the nine indicators, in respect to which first-order effect indicators were applied to form them. Accordingly, there was specification of the relationships among the residual variances of the interaction indicators, such that the indicators iguuxh, iguuxa, and iguuxp had correlated residuals, where each one includes the uniqueness of igu. Similarly, the indicators branded tguuxh, tguxha, and tguuxp ought to have correlated residuals, where each contained tgu. Likewise was for indicators branded pguuxh, pguxha, and pguuxp ought to have correlated residuals, where each contained pgu.

According to Little *et al.* (2006), another very essential feature of interaction term is that associations between residual variances of indicators ought to be freely estimated. In other words, the product terms iguuxh, iguuxa and iguuxp share indicator igu therefore correlations between their errors variances must be estimated freely. The two remaining product sets display similar pattern: tguuxh, tguuxa, tguuxp shares tgu while pguuxh, pguuxa, pgu uxp includes pgu thus freely estimated correlation of the error variances must be specified in the every set. The same rule applies to the three sets of indictors sharing variables of uncertainty avoidance: uxh (iguuxh, tguuxh, pguuxh), uxa(iguuxa, tguuxa, pguuxa) and uxp(iguuxp, tguuxp, pguuxp).

In summary, to analyze user experience moderating role on the link between EGUS and PVES, EGUS and UX were designed as latent variables with 3 indicators (igu, tgu, and pgu for EGUS, and uxh, uxa, uxh for UX). The public value of e-government services (PVES) was the outcome variable the model and was modeled as a latent variable with 3 indicators for every variable (psv, pov and ptv). The moderator variable was the interaction of EGUS and UX and was constructed as elucidated above. In conducting moderation the latent interaction term is not permitted to correlate with the 2 main effect latent variables EGUS and UX (Lin et al., 2010). Figure 4.12 shows the effect of EGUS on PVES moderated by UX. The findings demonstrated that the moderator model had a good data fit (χ2/df = 1.098, CFI = 0.941, PNFI = 0.596, TLI = 0.924, and RMSEA = 0.068). The paths both from e-government usage and user experience to public value of e-government

services were positive and statistically significant (β= 0.241, p < 0.001 and β = 0.457, p < 0.001 respectively). Similarly, the path from the interaction effect to public value of e-government services was statistically significant (β= 0.354, p <0.001) demonstrating that user experience did moderate the association between e-government usage and public value of e-government usage. Thus, the research rejected the null hypothesis.

Figure 4.12: Effect of EGUS on PVES moderated by UX



Source: Amos Computation

Table 4.38: Summary of Hypotheses Testing

Objectives	Null Hypotheses	Findings	Conclusion
Objective 1: Establish the relationship between contextual factors (ICT infrastructure, Human Capital, Governance) and e-government usage	**$H0_{1a}$**: There is no relationship between ICT infrastructure and e-government usage	β = -0.032 t-value = 0.361 p = 0.645	**$H0_{1a}$ Not Rejected:** The result indicated a statistically insignificant positive relationship at p>.05.
	$H0_{1b}$: There is no relationship between human capital and e-government usage	β = 0.169 t-value = 3.206 p = 0.009	**$H0_{1b}$ Rejected:** The result indicated a positively statistically significant relationship at p<0.05 .
	$H0_{1c}$: There is no relationship between governance and e-government usage	β= 0.167 t-value = 4.278 p = 0.005	**$H0_{1c}$ Rejected:** The result showed a positive statistically significant relationship at p<0.05
Objective 2: Establish the relationship between contextual factors (ICT infrastructure, Human Capital, Governance) and Public Value of E-government Services	**$H0_{2a}$**: There is no relationship between ICT infrastructure and public value of e-government services	β= 0.116 t-value = 1.391 p = 0.624	**$H0_{2a}$ Not Rejected:** The result indicated a statistically insignificant positive relationship at p>0.05.
	$H0_{2b}$: There is no relationship between human capital and public value of e-government services	β= -0.057 t-value = -4.245 p = 0.025	**$H0_{2c}$ Rejected:** The result showed a negative statistically significant relationship at p<0.05
	$H0_{2c}$: There is no relationship between governance and public value of e-government services	β= 0.408 t-value = 6.068 p = 0.000	**$H0_{2c}$ Rejected:** The result showed a positive statistically significant relationship at p<0.05
Objective 3: Determine the link between e-government usage and public value of e-government services	**$H0_{3}$:** There is significant relationship between E-government usage and the Public value of e-government services	β= 0.092 t-value = 7.582 p = 0.035	**$H0_{3}$ Rejected:** The result showed a positive statistically significant relationship at p<0.05
Objective 4: Establish the relationship between user experience and public value of e-government services	**$H0_{4}$:** there is no significant relationship between user experience and the public value of e-government services	β= 0.422 t-value = 6.050 p = 0.000	**$H0_{4}$ Rejected:** The result showed a positive statistically significant relationship at p<0.05

Objective 5: Establish the mediating effect of e-government usage on the relationship between contextual factors (ICT infrastructure, Human Capital, Governance) and Public Value of E-government Services	**$H0_{5a}$:** E-government usage has significant mediating effect on ICT infrastructure and public value of e-government services	Sobel test = 0.174 Indirect effect p value = 0.064	**$H0_{5a}$ Not Rejected:** The results indicated No Mediation Indirect effect $p > 0.05$
	$H0_{5a}$: E-government usage has no significant mediating effect on Human Capital and public value of e-government services	Sobel test = -1.898 Indirect effect p value = 0.000, direct effect p value = 0.010	**$H0_{5b}$ Rejected:** The result indicated Partial mediation effect p value < 0.01, direct effect <0.01
	$H0_{5a}$: E-government usage has no significant mediating effect on Governance and public value of e-government services	Sobel test = 1.681 Indirect effect p value = 0.000, direct effect p value = 0.023	**$H0_{5c}$ Rejected:** The result indicated Partial mediation Indirect effect $p < 0.05$, direct effect <0.05
Objective 6: Establish the moderating effect of user experience on the relationship e-government usage and Public Value of E-government Services	**$H0_{6}$:** User experience has no significant moderating effect on the relationship between e-government usage and public value of e-government services	Regression coefficients EGUS to PVES $\beta = 0.457$, $p < 0.001$ UX to PVES $\beta = 0.241$, $p < 0.001$ EGUS_UX to PVES $\beta = 0.354$, $p < 0.001$	**$H0_{5a}$ Rejected:** The result indicated moderating effect of user experience on the relationship between e-government usage and public value of e-government services

4.15 Chapter Summary

This chapter presented the findings of quantitative data analysis. The chapter commenced with preliminary data analysis that included descriptive and exploratory factor analysis. The descriptive analysis covered demographic profiles, e-government usage frequency and devices owned and mostly used to access e-government services. The demographic profile indicated most respondents were male that represented almost two-third of the sample. Also, noted was that the youth mostly uses internet and e-government services. Subsequently, EFA was conducted so as to evaluate the validity and reliability of measurement scales and check cross loading of items to different variables.

The chapter then presented quantitative data analysis using SEM which consisted assessing of the measurement and structural models. The assessment of the models was carried out using CB-SEM AMOS software. In conducting SEM analysis the overall measurement model measures were established pegged on the threshold values recommended in the literature. The initial proposed measurement model failed to fit the data. To purify the measurement model for each construct, the initial one-congeneric measurement model analysis for each construct was conducted. Standardized factor loadings, standardized residual and modification of indices diagnostic tests were conducted to purify each model where some items were dropped. SEM was also used to satisfy the criteria of convergent and discriminant validity. In evaluating the structural model, the findings indicated that all the goodness of fit measures satisfied the tolerable threshold values hence offering a good data fit-model. The assessment of the model path demonstrated that out of eight premeditated causal relationships, six path relationships were found to be significant whereas the other two paths were not supported.

CHAPTER FIVE
QUALITITATIVE DATA ANALYSIS

5.1 Introduction

This chapter presents the analysis of the findings of the qualitative data to complement quantitative data findings. The chapter consists of two sections. The first section presents the demographic details of participants of the interview. The second section presents the findings of qualitative data analysis and interpretations.

5.2 Participants for Interview

The participants of the interview were selected based on varied demographic characteristics. Amongst those who participated in the interviews, 2 were within the age bracket of 18-30 years, 3 in the 30- 40 age bracket, 3 were within the age of 40-50 bracket and 1 participant was above 50 years old. The participants also represented a variety of sectors namely; 3 from government employees, 2 were students, 2 from the private sector, 1 self-employed, and 1 unemployed. Table 5.1 depicts interviewees' demographic information. The researcher conducted the interviews between May and July 2016.

Table 5.1: Demographic Information of Interviewees

Participant	Age	Education Level	Position	Internet Experience
C1	34	Bsc Computer	Government employee	5 years
C2	46	MSc Information Systems	Government employee	12 years
C3	46	Bcom	Government employee	16 years
C4	27	Diploma	Private Sector	6 years
C5	35	Bsc	Unempoyed	6 years
C6	22	Undergraduate	Student	3 years
C7	38	PhD student	Student	8 years
C8	47	Diploma	Business	4 years
C9	52	Diploma	Private sector	10 years

5.3 Qualitative Data Analysis

Theory-driven thematic analysis (deductive technique) was adapted to analysis qualitative data. Deductive approach implies that researchers make use of existing theory as opposed to the inductive approach that seeks to build up a theory based on the data collected (Saunders et al., 2011).

Thematic analysis consists of several steps including familiarization of data to be collected, data transcription and coding (Howitt, 2010). Familiarization with data was conducted to obtain a deeper discerning of the facet of the data gathered. Transcribing of data involves transforming data that has been recorded into on paper format for subsequent analysis. In this research data was already transcribed on written format. Coding of data entails assigning particular codes for every line of text or more lines of the transformed text (Howitt, 2010). In this research, the data categories and codes employed to analyze the data followed a predetermined analytical framework (chapter 3) and also drawn from existing theories.

5.4 Research Findings for Qualitative Analysis

The qualitative research findings were organized around the six global themes based on a prior conceptual framework (chapter 3) namely, ICT infrastructure, human capital, governance, e-government usage, user experience and public value of e-government services.

5.4.1 Global Theme One: ICT Infrastructure

The qualitative analysis of this research commenced with investigating the effect of ICT infrastructure on e-government usage and public value of e-government services. Deriving from citizen-centric perspective literature, three sub-themes were abstracted from ICT infrastructure. The sub-themes included reliability, availability, and accessibility of ICT infrastructure. Initially, the focus of the interview was on these three indicators. However, during the interview process, other aspects linked to the concept of ICT infrastructure surfaced. In general, after analysis of gathered data from interviewees ICT infrastructure factors comprised of availability, accessibility, reliability, systems integration and e-commerce infrastructure. The following sections represent findings of ICT infrastructure sub-themes.

As discussed in section 2.4.1 of chapter two, reliability of ICT infrastructure was associated with usage of online services and public value of e-government services. In this study, some of those interviewed agreed on this proposition. The following segments from the interviewees' transcripts of participants C2, C4, and C7 clearly reflect this;

> *"Speed of internet is very important for me ……sometimes I feel government website too heavy and taking too long to load online services. This discourages me searching for government information online. Government needs to improve the speed of their online systems"* **(C2)**.

> *"I experience interruptions and delays of services time to time when using e-government websites; In particular, I tried several times to do my tax return on I-tax- systems. The system was too slow."***(C4)**.

> *"Many e-government systems lack the ability to undertake several tasks at the same time and the speed of searching and processing information is slow, I could not apply for [4]HELB loan because the system was down.**" (C7).***

The second basic subtheme of ICT infrastructure was availability. Availability refers to citizens being capable of accessing e-government services throughout the day, in a week and using different channels. Availability of e-government services provides citizens, government employees, and partners with the flexibility of carrying out their transactions outside usual working period. The majority of those interviewed contended that the success of e-government services is affected by the ICT infrastructure availability. The following responses from interviewees C5 and C7 reflect this;

> *"The government should avail ICT resources such as the internet in different public places. Internet should be available at public community centres and recreation centres as well as in residential estates. This will go a long way of citizens embracing technology and e-government services" (**C5)**.*

[4] HELB : refers to Higher Education Loans Board

"We must have infrastructure as a road to deliver services. We can have very good e-government services but if we don't have infrastructure to Marsabit for example, we don't have infrastructure to Taita Taveta, we will not help someone from Taita Taveta. So we must have proper infrastructure up to the remote level, for the citizens to be able to access these services" ***(C7).***

Similar views were observed from participants who emphasized that apart from availing e-government services 24 hours, 7 days in weeks, accessing online public services and information using different channels such as mobile phones is essential. The majority of the participants agreed that having multiple access channels that the public can opt to use in accessing e-government services will likely enhance the use of e-government services. They stated that citizens in a different environment are in a position to access e-government services through the use of any of the multiple channels accessible to them. Excerpt from interviewee C4 asserted;

*"The government should avail e-government services through different channels especially portable devices such as mobile phones, tablets for convenient and so that one can access e-government services anytime and anywhere, this will also save time and money by not visiting government offices or cyber cafes"(**C4)**.*

Some interviewees commended the government for establishing "Huduma Centres" at various towns where citizens can access e-government services. Interviewee C2 remarked;

"I am happy that through "Huduma centres" citizens can conveniently access government services" ***(C2).***

The third subtheme of ICT infrastructure was accessibility. From the literature, accessibility means that websites are reachable by citizens who have physical, motoric or perceptual disabilities (Al-Soud & Nakata, 2010). Accessibility has been regarded as one of the key features that public websites must possess and is regarded as a public value in the inventory formed by Jorgensen and Bozeman (2007). According to literature; information available for users with disabilities is considered important not only for legal reasons but more significantly for ethical reasons (Al-Soud & Nakata, 2010). The large number of people who have visual, motor hearing, and cognitive impairments need not be

locked out from e-government initiatives (Youngblood & Youngblood, 2013). Literature also postulates that non-compliance with World Content Accessibility Guidelines (WCAG) is in fact, a form of discrimination against individuals with disabilities.

Some of the participants stated that when government organizations design their e-government systems especially websites they do not recognize the needs of citizens with disabilities. Interviewee C2, for example, stated;

> *"Government organizations should not only strive to avail e-government information and services in different places but design websites that meet international accessibility standards. For example, the websites should provide alternative text attribute for sounds that played with or without user interaction, including stand-alone audio files element that can be used by people with visual disabilities"* ***(C2).***

E-commerce infrastructure and systems integration emerged as two important factors associated with ICT infrastructure. The majority of those interviewed recommended for the need of government agencies to develop e-government systems with online payment capability to support online payment of government transactions. This could involve payment of fees and rates for various government agencies. The majority of those interviewed suggested that government agencies should be integrated with financial institutions so that all services can be availed from a single access point. They stated that this would result in people spending less time and money when services are accessed at a single point. Some of the interviewees pointed out that they have embraced online payment of public services for instance fines payment and paying taxes electronically because as it is more convenience. Interview excerpts from C2, C5 and C8 participants exhibit the significance of e-commerce infrastructure;

> *"Government websites should incorporate payment capabilities so that citizens can make payments of services such as rates, fines easily"* ***(C2).***

"As long as government online systems are not integrated with other systems so that people can make online payments, some citizens will not bother using e-government services" ***(C5).***

"I value government websites that offer all services at a single point. For instance, in E-citizen websites one is able to pay for his driving license and download a copy. This is convenience and less costly" ***(C8).***

Integration of systems of different government departments or agencies and even private sectors was also considered essential by the majority of those interviewed. They stated that they expect to access all government services or accomplish all transactions at a single access point. The respondents recommended that systems from different organizations in either public or private sector need to be linked to each other to improve the overall performance of services. Further, participants stated that linking government systems and the ability of information to be shared create greater efficiency. More so, they contended that systems integration improves the performance of the systems by reducing duplication of data and diminishing inconveniences for the users. The main concern by the interviewees was that most current e-government systems lack the ability to link or speak with each other. This was exemplified by excerpts from interviewees C3, C4, C6, and C9 who asserted;

"The government should improve information sharing between government departments" ***(C3).***

"It is important for the government to have an integrated approach to managing the various systems across and within government departments" ***(C4).***

"All government systems need to be interlinked so that citizens can access services at a single access point" ***(C6).***

"I wish all services are accessible at one point. My opinion is that the government should interconnect e-government systems across different government agencies so that they can share information. This will help people stop making several visits to government organizations for services that can be accessed at one point" **(C9).**

In summary, a number of factors related to ICT infrastructure that affects the usage of e-government services and valued by citizens were identified. More importantly, besides reliability, availability and accessibility factors, other ICT infrastructure related factors valued and affecting e-government usage were identified. The factors were namely systems integration and e-commerce infrastructure.

5.4.2 Global Theme Two: Human Capital

Human capital was exhibited by three sub-themes namely; IT knowledge and skills, duration of internet usage and frequency of internet use. Interview findings reveal IT knowledge and skills influenced e-government services value and usage. Interviewees C1, C3, C4, C5, and C9 agreed that the citizens who have IT knowledge and skills are likely to use e-government services. The following are some excerpts from interviewees C1, C3, C5 and C8 supporting this argument;

> *"Many people rarely use e-government services because of lack requisite computer knowledge and skills. They are not able to navigate through the internet personally, after computer literacy training I started using online -government services. The training gave me confidence"* ***(C1).***

> *"I have no problem using e-government services. I believe that Internet experience that enables me to use e -government services easily "****(C3).***

> *"I believe my training in ICT, has enhanced my usage of e-government services. I am now able to access government services with little assistance. More so, when the person is more educated, he/she can see and understand the benefits of government services offered by the government online and therefore embrace the services".* ***(C5).***

> *"An ICT course should be taught in our schools to make the new generation aware of its importance and benefits, this will make easier for those with ICT skills able to use e-government services with fewer difficulties"* ***(C8).***

Other interviewees pointed out the role of prior experience in the use of government online services. They argued that citizens with prior experience are expected to re-use of e-government services: for instance interviewee C2 stated;

> *"It is because of my frequent use of computers and internet that I am able to access and use e-government services"* ***(C2).***

Interviewee C8 adds

> *"The more one uses e-government services, the more one gain confidence of the services"* ***(C8).***

Therefore, basic ICT knowledge and skills and prior experience of e-government services usage impact on usage of the services. This is consistent with existing literature, which postulates people with necessary training are likely to use the services (Alomari, Sandhu, & Woods, 2014).

The other factor associated with human capital and featured prominently was awareness of the available and benefits of e-government services. E-government services awareness refers to as the extent of knowledge and recognition citizens has about e-government services. Awareness encompasses governments promoting their array of service offerings so that citizens and businesses are understood exactly what types of services are available. According to the majority of those interviewed, citizens who are likely to use e-government services are those citizens who are aware of the existing e-government services and their benefits. More so, lack of awareness can result in low utilization of e-government services (Ndou, 2004). For instance, Interviewee C1 stressed;

> *"Possession of the necessary education or skill levels by the citizens is not sufficient for people to use e-government services. The government needs to create awareness on availability and benefits of e-government services"* ***(C1).***

Interviewees C4 and C7 pointed the importance of introducing e-government services concepts and benefits to the public through creating awareness before asking them to use them. An excerpt from interviewee C4 supports this assertion;

"Why many Kenyans are receptive to services offered at the huduma centre, is because the government conducted vigorous media promotions that raised the public awareness of the services offered at the huduma centers. For citizens who have no the slightest idea of the availability of e-government services, seldom use them" **(C4).**

Interviewee C7 added;

*"User awareness of e-government services is very important; we can have different online services on offer by the government. However, if users are not aware of the existence of these services, they will not use them, so we must create awareness through advertisement, via different media and public education, so that people can use the services"**(C7).***

Interviewee C1 suggested;

*"The government should provide ICT education and training courses to citizens and employees to increase the level of their awareness of available e-government services and their benefits" **(C1).***

While interviewee C9 averred;

*"We discussed about prior experience of using e-government services. However, there are other factors that should be prioritized. One is awareness about e-government services. Raising awareness of available and benefits of e-government services among citizens' will definitely leads to increased usage and trust in e-government services" **(C9).***

Drawing from interviewees' remarks, it was apparent that citizens' awareness of existing e-government services and their benefits is critical to the success of e-government. In other words, when the public is aware of the services government offers electronically, there is indeed a higher possibility of citizens using these services. However, in the case of developing countries, it is noticeable that governments do not allocate sufficient effort to promote e-government services and thus results in low usage of e-government services (Alomari, 2011).

Lastly, associated to human capital was digital divide concerns. The majority of those interviewed stressed that a discrete sector of the population faces significant and possibly indefinite lags in its adoption of ICT through circumstances beyond its immediate control. These obstructions are associated with culture, high cost of internet and personal computers, education and age. The majority of interviewees pointed out these digital divide related issues to be an impediment in accessing e-government services especially for people who live in rural areas. For instance, interviewees C1, C6 and C9 statements reflect this;

> *"There are different cadres of people in the society. We have aged people and people who live in rural areas. These people are usually not informed as well as wealthy as people who live in urban areas and they are less technology oriented. It is, therefore, importance to pay attention to such group of people to help them access and benefits from e-government services"* ***(C1).***

> *"Availing to citizens diverse access points of e-government services such cyber cafes, more "Huduma Centres" in remote areas, internet access at a public place and other technological resources will allow more people to access e- government services"* ***(C6).***

> *"E-government services access points should be decentralized to county and sub-county levels. Currently, access points such as "Huduma Centres" are found mainly in major towns or cities. This creates an imbalance in the provision of online government services"* ***C9)***.

5.4.3 Global Theme Three: Governance

Governance sub-theme as abstracted from the literature was reflected by policy and regulatory framework, transparency and citizens' participation or involvement in the development of e-government services.

In regard to policy and regulatory concerns, the majority of those interviewed agreed that presence of sound policy and regulatory framework that relates to e-government services is important (C1, C2, C3, C4, C6, C8 and C9). As mentioned in the literature a strong

policy and regulatory framework that governs online services is valued and affect e-government services usage (Karunasena & Deng, 2012). Sentiments from some participants asserted that lack of formalized and legalized processes in the provision of e-government services contributes to citizens not using e-government services. The majority of the interviewees agreed that currently there is no strong policy and regulatory framework that govern online public services in Kenya. For example, interviewees C4 and C9 stated;

> *"Why I fear using e-government services is that there no clear laws that regulate online transactions and aimed at protecting citizen personal data and online rights"* ***(C4).***

> *"Our legal framework concerning e-government services is not supportive. For instance, documents attached in the email are not considered as legal documents"* ***(C9).***

Similarly, C2 noted that lack of policy and regulatory framework generally reduces the trust of citizens on e-government services. While C8 agreed that existence of protection laws guiding e-government services builds confidence and consequently lead to acceptance of e-government services. An excerpt from interviewee C7 supported these statements;

> *"Existence of good laws outlining how my details will be used and stored in e-government systems would make me comfortable using e-government services"* ***(C7).***

Transparency formed another subtheme of governance. In e-government context, transparency refers to as the extent to which the public obtain a lucid understanding of the functioning of a particular government process or service (Ball, 2009). Transparency is viewed as an instrument for an external stakeholder to ensure due process and assess the internal effectiveness of an organization. Transparency can be understood as an institutional relation of monitoring and oversight, as information exchange over decisions and actions, and as a means of understanding how governments work and what they

achieve (Meijer, 2013). In this study, understanding the relationship between transparency and the usage and public value of e-government services does not simply have theoretical significance but as well an implication on transparency policies of the government. The majority of interviewees pointed out that only a few government agencies are transparent and open in the process of developing and offering -government services. Interviewees C3 and C6 excerpts reflect this;

> *"The government agencies need to be more open in the process of implementation of its services in order to succeed in e-government"* **(C3)**.

> *"I expect that e-government allows citizens to track their own government transactions"* **(C6)**.

Interviewee C7 expressed similar views with C6. He explained why transparency is so important in e-government success;

> *" Assuming that a government website describes, for instance, on what basis the government allocates higher education students loan, provide grounds the student's loan application can be rejected, the applications that are given processing priority and mechanism for tracking the status of the loan application. This would be extremely valuable and useful to loan applications. "The government should always explain her e-government policies to the public, for instance, the public need to be told how the government will use information it stores in its databases as these will determine whether they will use e-government services"* **(C7)**.

Grimmelikhuijsen and Meijer (2012) noted that improving the transparency of public organization can result to increased trust of public organizations and credibility for the government. Also, the majority of those interviewed in this study concurred that government that is open in her e-government services provision enhances the trust of online services.

Participation of the public in e-government development was another useful basic theme related to governance. Participation refers to citizens' engagement in the process of decisions making in the development of e-government systems. Researchers have advocated for citizens engagement in design of public services so as identify and develop services that suit their needs (Axelsson & Melin, 2008; Holmes, 2011). Lack of co-production of e-government services between citizens and government has been singled out as a hindrance for full take-up of e-government services (Savoldelli et al., 2014). According to the majority of Interviewees, citizens are rarely involved in the development of e-government services hence government has little comprehension of what citizens really need and desire. From excerpts of those interviewed, there were suggestions by participants how citizens should be involved in the process of developing e-government services. Some participants stressed for citizens to be involved in the formulation of policies and enacting laws regarding the services. Others suggested for citizens involvement in the process of designing of e-government systems. Remarks from interviewees C2, C7 and C9 reflect this;

> *"Government organizations need to be involving citizens in the enactment of laws and policies related to e-government development. This raises citizen trust of government, which in turn increase the use and the satisfaction of e-government services"* ***(C2)***.
>
> *"Before introducing any e-government service, public views and needs should be accommodated because at the end of the day, these services will be for the people intended"* ***(C7)***.
>
> *"I have not observed active participation of citizens in the process of designing of e-government systems"* **(C9)**.

Interviewee C6 also echoed the importance of citizens' involvement in e-government development such as the development of e-government websites. The following is an excerpt from interviewee C6;

"Government agencies that allow citizens to participate in website design make them feel appreciated and valued for the knowledge they shared and they may be in future use the same websites" ***(C6).***

Lack of involvement of citizens in decision making about e-government services development affect trust in e-government services. This assertion is reflected by the statement from interviewee C8;

"If the government does not involve citizens in decision-making related to e-government development and change management, citizens may not trust e-government services and thus affecting the adoption, implementation, and use of e-government services" ***(C8).***

To promote e-government usage the participants also recommended for the government to establish incentive and reward systems to encourage citizens take up of e-government services. Innumerable of the participants asserted that the provision of rewards and incentives to the users of e-government services could advance the uptake of e-government applications and services rather than conventional methods, which are still preferred by a number of citizens. An excerpt from interviewee C4 reflects this;

"Just like private sectors organizations such as banks, where one of the reasons customers use online services is that they offer incentives and rewards such as lower transaction changes. The government could persuade citizens to use the e-government systems to conduct their transactions by offering some incentives such as waivers or charging less to those who use online services instead of traditional methods" ***(C4).***

Interviewee C9 added;

"Those who use e-government systems to transact need to be charged less, just like in banks. In the bank, for instance, those who use ATM services to withdraw money pay less than those who withdraw over the counter" ***(C9).***

The other factor that emerged from qualitative research associated with governance was responsiveness of public agencies to citizens concerns about e-government services. The majority of interviewees asserted that the ability of government organizations officials to respond to citizens' inquiries swiftly is very important and may lead to encouragement to citizens to use of e-government services. The majority of those interviewed revealed that public staff responsiveness on e-government services matters at present was unsatisfactory. This was evident by interviewee (C7) excerpt who stated;

> *"When I have a problem with using e-government services, I rarely get help from the public despite making inquiries through calls or emails. Due to this reason, I am forced to visit their offices"* ***(C7).***

5.4.4: Global Theme Four: E-government Usage

E-government usage was examined by referring to the various e-government services categories as abstracted in e-government services maturity models (Chatfield & AlHujran, 2007). The three services identified composed of information access and two way communication, transaction completions and participatory services (Lee, 2010). Previous literature postulates that the usage of each category of e-government service could differ depending on the perception of the service. For instance, Shareef et al. (2011) posit that citizens may prefer to use government websites to look for information but not performing transactions and vice versa. With the purpose of having better appreciation of e-government services, the usage of three (information access, transaction completion and participatory) types of services were evaluated using qualitative research.

The majority of those interviewed affirmed that e-government programs in Kenya are still at the nascent stage of maturity and offer limited services. They stressed that many of government agencies only publish information on their websites and provides limited interactive and participatory services. Excerpts from interviewees C1 and C5 reflect this;

> *"From my assessment, most government organizations in Kenya provide basic services on their websites. Very few provide interactive services. We need more of interactive and e-payment services as they are more useful"* ***(C1)***.

*"Currently there is minimal online interaction by citizens and public officers. I expect two ways interaction with government to express our opinions on any topic under discussion, but most of the time there are no people from the government side that read what has been written and reply to our comments and suggestions, otherwise, such communication will be of no use "**(C5).***

5.4.5 Global Theme Five: User Experience

Hedonic, pragmatic and aesthetic attributes formed the sub-themes of user experience. The pragmatic attributes included the usability facets of government websites such as ease of use, free of errors, lucid information and content, navigation easiness and easiness of recalling of e-government websites (Law et al., 2009; Schulze & Kromker, 2010; Van Schaik & Ling, 2008). The Hedonic attributes comprise the enjoyment, fun and frustration or disorientation faced by users of e-government websites and services (Law et al., 2009), while the aesthetic attributes detail visual appearance, clarity and style of government websites (Glanznig, 2012).

The majority of interviewees agreed that good design of e-government websites that makes it easy to use and user-friendly positively impact the usage of e-government services. For instance, Interviewees C1, C2, and C4 remarks reflect this;

*"If the government website is easy to use, then services will be done very quickly and easily"**(C1).***

*"Yes, it is, websites that are easy to understand look more appealing and more acceptable to people than other government websites that are difficult to use or not user-friendly" **(C2).***

*"Government agencies should design their government websites in a way that they are easy to use by the users. The majority of government organizations focus on creating websites without consideration of ease of use of the websites. I believe if government websites are user-friendly, the level of services usage for the users to interact with the systems may increase" **(C4).***

Participant C4 further said;

> *"The poor design of some of the current government websites makes it very difficult to search for specific information"* ***(C2)***.

The above assertions by interviewees C2 and C4 clearly indicate that usability aspects of government websites are valued and affect e-government success. Complementary views were observed from interviewee C6 by emphasizing on the value of excellent design of public websites. C6 stated;

> *"I believe good design of government websites may boost the citizen's trust in the government and therefore, adopting and implementation of e-government* services" **(C6).**

Some interviewees also recommended for designing e-government websites where the public could recall easily most of the features of e-government websites. The justification was that this could result to citizens re-visiting the websites on their own devoid of the need to apply more effort and time to do so: An excerpt from interviewee C9 reflects this;

> *"The government websites should be easy to remember especially if one want to revisit the same website on a later date to conduct transactions in order to avoid excess time and effort remembering the website"****(C9).***

Others stated one of the essential characteristics of excellent government websites is availability of different ways of disseminating information or accessing online services to citizens. For example, text, audio, and graphic to serve all citizens: For instance interviewee C1 stated;

> *"The government website should provide information in a variety of forms such as text, sound and graphic"* ***(C1).***

Focusing on hedonic attributes of user experience, some participants attributed enjoyment or pleasure in using new technology as being related to e-government usage. For instance, Interviewees C3 and C5 stated;

> *"If the user enjoys using services that imply the user is happy and satisfied with these services and that affects the adoption of e-government services. So enjoyment is an important factor*" **(C3).**

> *"I use e-government service*s because of excitement and fun" **(C5).**

In contrary, Interviewee C8 avowed the following regarding enjoyment;

> *"I think enjoyment does not have a role in the use of online services. Citizen uses e-government services for a specific objective, not for enjoyment. My opinion is that enjoyment does not help or encourage citizens to use electronic government services. There are many other ways the public enjoy doing like playing online computer games" **(C8).***

5.4.6 Global Theme Six: Public Value of E-government Services

As presented in the literature (chapter 3), Moore's model (1995) advocates that to generate public value, managers should focus on three key areas: services, outcomes, and trust. The qualitative aspect of this research also focused on these three building blocks of public value.

Interviewees were asked on what they value from e-government services. The majority of interviewees' stated that they value provision of online quality services. Quality services attribute derived from literature review included; accurate information, relevant information, current information, efficiency and cost effectiveness.

Divergent observations regarding e-government services quality emerged. The majority of interviewees (C2, C3, C5, C6, C8, and C9) pointed out that they derive value from quality online services. Excerpts from interviewees C2, C3 and C6 reflect this;

> *"The availability of government services 24/7 is convenient for me"* **(C2)**.

"Using of e-government services saves money and time" **(C3)**.

"Previously citizens traveled long distances, spending a lot of money and time to obtain government services. However, by using e-government services, many people have been able to do all of that at their homes or workstations, and this saves money and time" ***(C6).***

Interviewees stressed the significance of including only information relevant to the public on the government websites that fulfils their needs. The excerpt from interviewee C3 reflects this;

"The government websites should contain only the relevant information. Currently, some government websites I have visited contain a lot of incorrect and not up-to-date information. I suggest that government agencies to focus on putting information that is up to date and accurate on their websites. it is very annoying when sometime you visit government websites and find that it was updated one or two years ago, and that means all the information is useless, you have seen it one year ago and it is still the same" ***(C3).***

The second sub-theme of public value was the realization of achieving desirable outcomes through e-government services. Four basic themes namely, (a) reducing corruption, (b) achieving social fairness or equity, (c) promoting public participation in democracy (e) and reducing environmental pollution reflected desirable outcomes in this study (Karunasena et al., 2011).

Extant literature point out that many developing nations invests in e-government to address the problem of corruption in public sector. Corruption broadly refers to the abuse of public power for personal gains. Corruption in public sector is a national problem in Kenya. "[5]Chai" or "[6]kitu kidogo" are the terms used to describe corruption in Kenya. To obtain public services in Kenya, the public sometimes are compelled to pay" Chai" or "kitu kidogo" to public officers. The GoK have invested heavily in e-government to deal with

[5] Kitu kidogo is a word used in Kenya to mean a bribe.
[6] Chai is used interchargeably with the word "Kitu Kidogo" in Kenya to mean a bribe.

the problem of corruption. The majority of interviewees said they expect that online provision of government services to assist in reducing corruption level in the public sector. They argued that use of e-government services restrict the power of connections and contacts and give all citizens equal chances when accessing any public service. Interviewees C2, C6 and C7 excerpts put it clearly how corruption is negated through online government services;

> *"I am grateful that the government automated the renewal of driving licenses. Recently, I was able to renew my driving license seated at my workstation, without paying kitu kidogo, I also saved time and money as traveling I not required"* ***(C2).***

> *"Previously one could spend 3 days in order to renew vehicle license; one needed to fill a lot of papers, get a lot of signatures, and visit different offices. It was a horrible experience. To make the matter worse one needed to pay a chai to the government employees to be served. But nowadays, doing it online save time and money; one just need to enter his vehicle registration, make payments online and the license is renewed within 72. All this can be done at home; one does not need to visit any government office"* ***(C6).***

> *"Corruption will disappear, and justice will be achieved for all citizens, who will have equal chances to access government services"* ***(C7).***

However, a few of interviewees expressed reservations that if the implementation of e-government services if not done properly, corruption could shift to online services. They argued that reducing corruption would depend on the extent of human intervention in the systems and just provision of e-government services will not end corruption. Excerpts of interviewees C3, C5 and C8 reflect this;

> *"If there is no human interference, corruption will be very limited; where, on the other hand, if the interference is about 60% then corruption will still be there in the same percentage"****(C3).***

"I don't think e-government will end corruption, corruption has become a culture." ***(C5).***

"I think some public officers will still exploit e-government to perpetuate corruption, as it happened in devolution ministry" ***(C8).***

Equity can be defined as the availability of resources to all the public (Benington, 2011). Government should make sure that all people are in a position of accessing public services notwithstanding their limiting factors such as geographical location, income disparities or disability to guarantee equity (Karunasena & Deng, 2012). The majority of interviewees asserted that online provision of government services creates fairness. They pointed out that e-government gives all citizens' equal chances to access public services. This was reflected by Interviewees C4 and C6 who assertions;

"*E-government systems offer services to all citizens irrespective of status. Young and aged, poor and rich are treated equally, e-government services are guaranteeing fairness" (****C4).***

"Online government services provide equal chance to citizens in terms of accessing public services" ***(C6).***

Promoting participatory democracy was the other basic theme that depicted the concept of desirable outcome as a product of public value. In e-government context, democracy can be evaluated by exploratory the degree to which the views of citizens expressed through e-government are considered in the decision making (Gupta & Panzardi, 2008). The majority of those interviewed agreed that e-government may promote democracy. However, the majority of those interviewed asserted that the current environment in Kenya is unfavorable for implementing participatory democracy initiatives due to other underlying factors such as digital divide problems and lack political goodwill.

The next excerpt from the interviewee C2 excerpt evidently reveals the participant's dislike to the current participatory democracy programs;

> *"I don't think e-participation is working in Kenya. In Kenya, the digital divide is still high, only a few people have access to the internet. People in rural areas have no computers and the internet. Therefore, even if the government introduces e-participation initiatives and request for citizens' contributions, the majority of ideas will not be represented as may be only some people living in urban areas will give their inputs"* ***(C2).***

Lastly, environmental sustainability was the other desirable outcome of e-government. Environmental benefits from e-government applications may be through saving of energy, data and resource sharing, limiting duplication of efforts, reducing the use of paper and automating repetitive tasks (Labelle, 2008). The majority of interviewees agreed that use of e-government protects the environment. They stated that continuous application of e-government services generates public value for the public through gratifying their needs in protecting the environment for upcoming generations. For example, interviewees C2 and C5 and C7 stated;

> *"With e-government services, people don't need to be using their vehicles looking for public services. This reduces environmental pollution from fuel emission"* ***(C2)***.

> *"Provision of online services reduces traffic jam and pollution caused by vehicles as well as noise pollution. This is because citizens can access government services at their homes using personal computers and other handheld devices. In most cases there is no need of traveling"* ***(C5).***

> *"I don't need to always use papers to apply for employment; several government agencies are accepting online job application"* ***(C7).***

However, some participants' asserted that e-government development has contributed to additional environmental problems that were inexistence. They pointed out that e-government services are associated with the use of thousands of computers and related devices. These computers and devices pose severe threats to the environment in numerous ways. For example, interviewees C3 and C8 excerpts reflect this;

"Computer parts which are made up of metal and other e-waste such as cartridges, broken monitors and mobile phones, compact disks and will certainly pose many environmental threats in the future as byproduct" ***(C3)***.

"Increase use of computers results to increase demand for energy which results in depletion of other resources such as electricity and water. Therefore e-government could bring environmental threats than traditional government operations" ***(C8)***.

The last sub-theme of public value was trust of e-government services. Trust refers to public expectations from the achievement of positive response in relation to their desires from public services (Belanger & Carter, 2008). Although Grimsley and Meehan (2007), claim trust may be an example of an outcome, to strengthen the important of trust and be consistent with Moore's model this research does not include trust in the outcome construct. As predetermined in the theoretical framework (chapter 3), trust was organized in the following basic themes (a) privacy and confidentiality (b) security (c) information provided not wrongly used, and (d) information disseminated credible.

The majority of the interviewees contended that ensuring the privacy and confidentiality of citizen's information make its e-government services trustworthy and is highly valued by the public. Extant literature articulates the importance of privacy and security of citizens data and information since the uptake of e-government services increases when citizens are guaranteed of data security and information privacy (Mundy & Musa, 2010). Many of online public services require individuals to disclose their personal details. Such as their names, postal addresses, email address and even their telephone numbers. Interviewees C1, C4 and C7 averred of being troubled in revealing such sensitive information for instance when using their credit card and/or online banking as a result of increased cybercrimes. The interviewees suggested government organizations to implement stringent measures to thwart unlawful access to confidential information of citizens in e-government systems. Some interviewees averred that those public officers sanctioned to access their personal information should not reveal their identity without consent and should not use their information wrongly. Interviewee C5 for instance stated;

"The government organizations should make sure that unauthorized people will not get my personal identification without permission. Particularly, my bank's information is very important. The government must also make sure that even authorized persons will not misuse my personal information" ***(C5).***

A number of those interviewed cited prior occurrences question the Kenyan government's capability to guard information of citizens in e-government systems. For instance, interviewee C7 alluded;

*"The government agencies have no capacity to protect its websites from hackers, As recently reported in the media, It is evident that a number of government websites have been hacked at a certain point in time"****(C7).***

Upholding security of citizens' information was also found to be critical to guarantee citizen trust of e-government. Failing to uphold information security of citizens according to participant diminishes trust of e-government services. This was reflected in the remarks of interviewee C3;

*"It is important to ensure online payment of government services are secure and in case of any problem he/she will not lose money"****(C3).***

Some interviewees also indicated e-government services trust was as results of that they were frequent users of the internet either in carry out internet banking and shopping online. C4 and C9 articulated that by trusting e-commerce systems the same trust is replicated in e-government services as almost similar related processes and issues are encountered in both areas. Further, a number of interviewees were apprehensive regarding their personal data confidentiality in e-government systems. They said e-government service users' privacy rights might be open for intruders. An excerpt from interviewees C5 and C6 reflect this;

"Using e-government services is an excellent idea. However, in my view, it's not secure enough because hackers could break into the e-government systems and play with our personal data. In this some, 1 am usually very cautious in using the e - government systems and I frequently use it only for searching information" ***(C5).***

"My friend used his Visa card to buy a laptop from the Internet but because the lack of security he lost his money and did not receive any goods so, how can I trust the Internet and also online government services" ***(C6).***

5.5 Synopsis of Key Findings from Qualitative Aspect of the Study

The outcomes of qualitative findings of this research are summarized in Table 5.2. The table presents the two key dimensions under which the findings were organized: facilitating conditions (related to contextual factors) and citizens' expectation (perceived public value related factors). The dimensions are illustrated to the degree to which each dimension was determined to be significant on e-government usage. The findings of the study were organized based on the conceptual framework developed in Chapter three.

Table 5.2: Synopsis of Key Findings from Qualitative Aspect of the Study

Dimension/Factor	Description	Findings
Facilitating conditions for e-government usage and valued by citizens		
ICT infrastructure	ICT infrastructure includes availability, accessibility and reliability as basic enabler of e-government services effectiveness. Advanced ICT infrastructure comprising integration of e-government systems for offering citizens with integrated services was vital	Reliability and availability of basic ICT infrastructure, not a concern. Multichannel systems through which the public could use to access online services limited hence preventing the citizens from using e-government services Inadequate advanced ICT infrastructure related to systems integrations and e-commerce infrastructure was perceived as a concern.
Human Capital	This included citizens ICT knowledge and skills, past experience and awareness	A high percentage of citizens have basic computer skills. Low awareness of the benefits and available online information and services accessible from government Internet connectivity limitations predominantly in rural setting was prevalent, creating a digital divide problem
Governance	Policy and legal framework, transparency in e-government services provision and user participation are essential governance dimension of implementation, use and success of e-government services	Lack of sound legal and regulatory framework, low user involvement (participation) in the development of e-government services seen as contributing factors to low uptake of e-government services. The poor responsiveness exhibited by public official to citizens' queries contributed to low uptake of online government services

User Experience	User experience involves pragmatic, hedonic and aesthetic attributes of e-government systems	Usability features of e-government systems noted to mostly affect usage of e-government services Citizens had difficulties in accessing and navigating through government websites
Perceived value and Citizens expectations of e-government services		
Service quality and benefits	Service value entails quality of services that details performance expectations of e-government meeting the needs of citizens that influence intention to use. Service benefits entails direct benefits accrued from use of e-government services	Service quality was low in regard to untimely responses to queries of citizens and some information was not up-to-date Perceived benefits of using e-government services includes cost and time saving, and convenience in accessing public services
Desirable socially Outcome from e-government services	Realizing socially desirable outcomes from e-government services is another way to create public value	E-government services ensures equal opportunities for all citizens Online services have contributed to the reduction of corruption in public organization. Citizens are apprehensive regarding threat to the environment as a result of equipment related to e-government systems
Trust of e-government	Trust in e-government associated with perceptions of the privacy and security of citizens' data and information and credibility of government Government public trust affect confidence level of citizens in embracing e-government services	Trust of e-government by citizens moderately good. In regard to trusting e-government services, citizens hesitant of using electronic transactions due to lack of legal framework protecting their transactions

5.6 Chapter Summary

In this chapter, qualitative data analysis and findings drawn from individual interviews were presented. The chapter began with a presentation of demographic profiles of the interviewees. Subsequently, the findings of the qualitative data analysis were presented organized according to the prior themes derived from literature review and depicted in the conceptual framework in chapter three. The findings were interpreted and supported by the existing literature.

The study revealed that ICT factors namely systems integration and e-commerce infrastructure, human capital factors comprising ICT knowledge and skills, digital inclusion, introducing incentives and reward systems to e-government services users, awareness creation of the benefits and available e-government services and governance issues such as sound policy and regulatory framework, citizens involvement in the development of e-government services, responsive of public officers influence e-government usage and the public value of e-government services. Also, presented in this chapter were suggestions by interviewees that would help in advancing increase in uptake of e-government services. In the subsequent chapter, the summary, conclusion study contributions and its limitations, coupled with suggestions for further research, will be presented.

CHAPTER SIX
DISCUSSIONS AND A NEW FRAMEWORK

6.1 Introduction

This thesis empirically examined the relationship between contextual factors (ICT infrastructure, human capital and governance) on e-government usage and the public value of e-government services. As exposed in chapter three, the study employed the pragmatism philosophical orientation consequently applying concurrent mixed methods to realized research objective. On one hand, the quantitative aspect of the study used a sample of 315 citizens cutting across eight Kenya regions. The survey was conducted between the months of April 2016 to June 2016. On the other hand, the qualitative aspect of study explored the influence of the contextual factors on the public value of e-government services by conducting semi-structured interviews. Nine participants were interviewed. Interviews were conducted between months of May 2016 to June 2016.

This chapter presents discussions of findings for both quantitative and qualitative aspects of the study. The findings of quantitative and qualitative studies were first produced independently and subsequently triangulated. The chapter also presents a new framework developed from triangulated findings. The organization of the chapter is outlined as follows. The chapter commences with a presentation of a brief elucidation of how the findings of both quantitative and qualitative aspects of the study are triangulated. A presentation of discussions of the empirical results in reference to the research findings was next presented. Finally a new framework for evaluating e-government services developed from the discussions of the triangulated research findings was presented.

6.2 Triangulation of Research Findings

As aforementioned, the mixed methods approach used in this study provided an opportunity to use data triangulation across the quantitative and qualitative findings. Triangulation was employed at the stage of data analysis. Triangulation allows for in-depth study of phenomena and raises the credibility of the findings (Creswell & Plano, 2011).

Findings from both quantitative and qualitative data analysis were triangulated using concurrent triangulation strategy. Concurrent triangulation approach permits the researcher to separately analyze the quantitative and qualitative data (Sosulski & Lawrence, 2008). Afterward, the outcomes of triangulation analysis are compared for convergent, divergent, or complementary (Feilzer, 2010). According to Johnson et al. (2007), convergent results obtained for similar research problem from diverse methods enhances the internal consistency and validity of the research and this results to a better assurance in the conclusions arrived in the research. Whereas divergent results obtained from two dissimilar approaches allows the researcher to put up justification for the differences which could provide an opening for future problem explorations (Venkatesh et al., 2013). The findings derived from triangulation were corroborated with prior research findings from the literature.

6.3 Discussions of the Findings

The following section presents the outcomes of the tests of hypotheses. The findings from the test of hypothesis are compared with outcomes of the qualitative strand of the study and further compared with empirical findings from the literature for consistency or inconsistency.

6.3.1 Direct Effect of Contextual Factors on E-government Usage

Based on TOE theory, three contextual factors (ICT infrastructure, human capital and government) were identified (Krishnan et al., 2012). The three factors were conjectured to influence the usage of e-government varied across the different stage of e-government services (Lee, 2010). $H0_{1a}$ hypothesized a no correlation between ICT infrastructure and e-government usage. The results of the present study demonstrated no positive and significant correlation between ICT infrastructure and e-government usage. The results are consistent with research findings by (Elsheikh, 2012) and (Pudjianto et al., 2011) which found no direct correlation between ICT infrastructure and e-government services. The findings also agrees with United Nations (2012) e-government survey that confirms despite superior ICT infrastructure in developing countries such as, Arabian Gulf countries of Qatar, Saudi Arabia and Bahrain, Nigeria and Pakistan the levels of e-government usage

remained low (United Nations, 2012). However, the results did not resonate with other studies findings (e.g. Ndou, 2004; Sinjeri et al., 2010) which found that ICT infrastructure contributes to e-government acceptance in developing countries.

Drawing from qualitative general findings and theoretical literature Pudjianto et al. (2011) the insignificant results could be attributed to the existence of alternative channel for accessing internet and e-government services in developing nations which have grown considerably in the last decade. Further, the inconsistency may be attributed to the thriving of mobile telephony in developing nations which boosted penetration of the internet to the last mile users. For instance, Kenya has witnessed a significant development of telephony infrastructure and penetration of internet in the last 10 years (ICT Authority, 2014). The increase in the number of citizens using mobile phones offers technological options for accessing e-government services by citizens. In addition in Kenya, the establishment of telecentres namely "Huduma centers" has provided more access points across the country for delivery of e-government services. Further, significance reduction in prices for internet services that enable citizens to access the Internet for different purposes has been noted. All these happenings may signify conventional ICT infrastructure is no longer a major antecedent why citizens value e-government in Kenya. Therefore, the premise that ICT infrastructure influence e-government usage may be acceptable in the previous years (Carter & Belanger, 2005; Ndou, 2004).

The qualitative results presented information that offered also some useful propositions why conventional ICT infrastructure is no longer a significant determinant of e-government uptake. From qualitative results, new factors that were not included in the quantitative model due to lack of strong theoretical foundations related to ICT infrastructure emerged. Firstly, lack of integration of IT systems among various government departments may have contributed to less utilization of e-government services by public. In support of this argument Venkatesh et al. (2016) recommend for government agencies service provider side and technology solution provider designers side to work closely so that to provide e-government services that will be used by citizens. Secondly, the qualitative study also reveals that a number of participants were concerned about lack of e-commerce infrastructure that could help citizens to accomplish online payment of transactions.

$H0_{1b}$ hypothesized a no link between human capital and use of e-government services. Previous studies highlighted human capital deficiency within the public sector and wider society affects e-government usage (Moatshe, 2014). In reference to this exposition, human capital theoretical framework of this study was developed by incorporating human capital components; knowledge and skill and experience. The research findings from the quantitative study indicated positive and significant results. This demonstrated IT knowledge and skills are critical and influence positively usage of e-government services. In a study involving 105 participants in the USA, Belanger and Carter's (2006) disclosed that internet use directly is linked to e-government usage, while no link between computer experience and e-government usage. In Kenya, Otieno (2016) in his study for evaluating the intermediate impact of e-government found that citizens ICT knowledge and skill was directly related to use of e-government services. The qualitative aspect of this research supported the hypothesis. The majority of interviewees agreed sufficient IT knowledge and skills are critical and influence the use of e-government services. These findings concurred with empirical findings of prior studies. For instance, empirically (Alomari et al., 2014; Krishnan et al., 2013; Sinjeri et al., 2010) found a direct association between human capital and usage of e-government services.

$H0_{1c}$ hypothesized a no correlation between governance and e-government usage. From the extant literature, good governance practices such as availability of laws, regulations and sound legal frameworks were identified as precondition for success of e-government (Sorn-in, Tuamsuk, & Chaopanon, 2015; Suhardi et al., 2015). The success of e-government also demands government transparency (Das et al., 2017) and public visibility (Shareef et al., 2011). Drawing from these attributes related to governance, the results from the quantitative aspect of this research found a statistically significant and positively relationship between governance and e-government usage.

The results agreed with the findings of Girish et al. (2012) who found that sound governance such as supportive regulatory environment, transparency in the provision of government services encourage usage of e-government services. Similarly, the findings of this study concurs with a latest study findings that revealed that countries focusing on

governance issues such as being transparent in the process of development of e-government services results to high uptake of e-government services (Al Salmi, Hasnan, & Mohtar, 2016). Similarly, the qualitative aspect of this study provided a deeper insight by revealing that lack of adequate policies and laws; insufficient involvement of citizens and lack of openness in e-government development slows the acceptance of e-government services.

6.3.2 Direct Effect of Contextual Factors and Public Value of E-government Services

Public Value Theory by Moore (1995) posits that the public value creation is the cornerstone of the public sector in evaluating public services (J. Bryson et al., 2017). However, the question how value creation is conceptualised and what role it serves remain largely unanswered especially in developing countries. This study drawing on the ideas of public value theory (Moore, 1995) and TOE theory evaluated how contextual factors relate to how the public value e-government services. Specifically, hypothesis 2: tested the relationship between contextual factors and public value of e-government services. As in hypothesis 1, variables of contextual factors namely; ICT infrastructure, human capital and governance were used. Effect of these variables to public value of e-government services was examined as sub-null hypotheses $H0_{2a}$, $H0_{2b}$ and $H0_{2c}$ respectively.

$H0_{2a}$ hypothesized a no correlation between ICT infrastructure and the public value of e-government services. The findings of this study indicated a positive and no significant effect of ICT infrastructure on the public value of e-government services. The results agreed with recent empirical findings by (Mimbi & Bankole, 2016) who found that ICT infrastructure has no significant effect on public value creation in African countries. However, the findings were inconsistent with empirical findings of prior study in Sri Lanka by Karunasena (2012) found that ICT infrastructure positively influences the public value of e-government services. A theoretical argument is that the inconsistency may be ascribed to the reality that the technologies may bias towards the administrative and satisfactions targets and less focus on democratic values (Rose, Persson, & Heeager, 2015). Findings of the qualitative aspect of this study provided a further explanation that basic ICT infrastructure may not influence the public value of e-government services. Specifically,

the majority of those interviewees agreed that reliable and accessible ICT infrastructure is important but insufficient to induce citizens to use e-government services. The qualitative analysis further demonstrated significance of advanced ICT infrastructure such as interoperability of different e-government systems and inclusion of e-commerce infrastructure in e-government systems. They asserted systems integrations help citizens' access diverse services at a single point and also the availability of e-commerce infrastructure provides a platform for online payments.

$H0_{2b}$ hypothesized a no link between human capital and the public value of e-government services. The research findings of this research demonstrated a negative and significant relationship of human capital and the public value of e-government services. These findings were supported by the results of the qualitative aspect of this study which found that as people gain more education, they become more cognizant of the benefits and danger of using e-government services. If the dangers outweigh the benefits people may incline to use e-government services while utility or value of the online services reducing (Bannister & Connolly, 2014). Another plausible explication of having this unexpected result is due to the respondent's characteristics. The majority of the respondents have advanced experience in using computers and the Internet. As a result, this type of experience builds confidence which may lead to decrease in the impact of perceived value of e-government services.

$H0_{2c}$ hypothesized a no association between governance and the public value of e-government services. The quantitative findings of this study established a positive statistically significant relationship of governance and the public value of e-government services. The results corrabate recent empirical findings (Douglas & Meijer, 2016) who found governance to significantly contributing to the public value creation. The qualitative aspect of this research also disclosed that the lack of policy and legal framework, absence of transparency and citizens' engagement on e-government development reduces the utility of e-government services. The majority of those interviewed agreed that enhanced openness and citizens' involvement in decision making in e-government development makes citizens better informed about government and also gives citizens a sense of involvement and a sentiment that their needs are considered in e-government system's objectives.

In sum, the above results relating contextual factors and the public value of e-government services reflect that the public value of e-government as manifestation of social, political and technological imperatives. As conceptualized in the Structuration Theory the creation of e-government public value is as result of interaction between existing social systems and technology ((Orlikowski 1992). Therefore, the realization of public value of e-government services should not be understood as a techno-deterministic process but socio-technological process.

6.3.3 Direct Effect of E-government Usage on Public Value of E-government Services

E-government usage was reflected by stages of e-government services (Lee, 2010). Theoretical argument from prior literature conjectured that the public value of e-government increases at the higher level of e-government maturity model continuum (Al-Sebie, 2011; Chatfield & AlHujran, 2007). In this study, null hypothesis three ($H0_3$) predicated a no link between e-government usage and the public value of e-government services. The findings of this study demonstrated a negative significant path from e-government usage to e-government services perceived value by the public. The unanticipated results in reference to findings of qualitative strand of this study could be attributed to that e-government programs in Kenya are still at the nascent stages and the maturity of electronic services offered to the citizens are still on a narrow scale. The majority of the interviewees valued higher level services such as transactional and participatory services, however, these services are rarely provided.

6.3.4 Direct Effect of User Experience on Public Value of E-government Services

Null hypothesis four ($H0_4$) predicted a no correlation between user experience and the public value of e-government services. Results of quantitative research reveal direct positive relationships between user experience and the public value of e-government services. More so, the qualitative findings of the study were in agreement with the outcomes of the quantitative strand of this study. For example, the majority of the interviewees indicated that they found experienced difficulties in navigating through e-government websites. They stated they value clear, well presented and organized website contents.

The findings from quantitative and qualitative aspects of this study agree with (AlAwadhi & Morris, 2009), (Moczarny, 2011) and (Sivaji et al., 2014). AlAwadhi and Morris (2009) study found that government websites should preserve its objective of simplicity in the presentation of information. Moczarny (2011) study revealed citizens value government websites that possesses desirable features such as usefulness, ease of use, learnability and memorability, While Sivaji et al. (2014) study found that focusing on users' service design when designing public websites results to improved utility of e-government websites and this influence positively e-government usage.

6.3.5 Mediating Effects of E-government Usage on the Relationship between Contextual Factors and the Public Value of E-government Services

Null hypothesis five ($H0_5$) conjectured of no intervening effect of e-government usage on the association between contextual factors: (ICT infrastructure, human capital, and governance) and the public value of e-government services. The relationship between e-government usage and the public value of e-government services were found not to be mediated by the ICT infrastructure. However, the study findings indicated human capital mediated significantly the effect of e-government usage on the public value of e-government services and the mediating effect of governance on the association between e-government usage and e-government services public value was positively significant. These findings reflect that high investment in human capital support the assumptions that it will lead to increased usage of government services. These results demonstrated that government requires focusing more on governance issues such as establishment sound policy and regulatory framework, embracing transparency and involvement of users in e-government development and decision making.

6.3.6 Moderation Effects of User Experience on the Relationship between E-government Usage and Public Value of E-government Services

Null hypothesis six ($H0_6$) conjectured of no moderating effect of user experience on the association between e-government usage and public value of e-government services. The outcomes of this study revealed that user experience had moderating effect on the correlation between e-government usage and perceived value of e-government services by

the public. The results of this study agree with what theory predicted. The findings also concured with the results of other researchers, for instance, Castaneda, Munoz-Leiva, and Luque, (2007) studying websites found that user experience of the websites played a moderating role. Similarly, Liebana-Cabanillas et al. (2016) demonstrated a moderating effect of user experience on satisfaction with electronic banking.

6.4 Summary Comparison of the Qualitative and Quantitative Findings

Table 6.1 presents a juxtaposition of the quantitative and qualitative results. Each factor in Table 6.1 reflects attributes identified in the quantitative and qualitative aspects of this research. The number of stars related to each attribute represents the significance of each factor. One star (*) implies insufficiently significant, two stars (**) implies significant, three stars (***) signify highly significant and very highly significant represented by four stars (****). The extent to which each attribute was significant was obtained by assessing the measurement model in quantitative study standardized factor loading and by enumerating the themes in the qualitative findings. From the Table 6.1, the results of this study to some extent matched with the conceptual research framework. Besides, the findings of the analysis unearthed some other contextual factors which were found to affect e-government usage and the public value of e-government services.

Table 6.1: Factors Emerged from Quantitative and Qualitative Studies

Factor	Description from quantitative research	Description from qualitative research
ICT infrastructure	Reliability*** Availability** Accessibility*	Reliability** Availability** Accessibility* Systems integration*** E-commerce infrastructure ***
Human Capital	IT Knowledge & Skills *** Duration of usage** Frequency of usage*	IT knowledge & Skills*** Duration of usage** Frequency of usage* Awareness**** Digital inclusion**** Incentive and reward systems***
Governance	Policy and regulatory*** transparency*** Participation ***	Policy and regulation*** transparency*** Participation*** Responsiveness***
E-government Usage	Information** Transaction*** Participatory***	Information *** interaction*** Transaction*** Participatory***
User Experience	Enjoyment* ** visual appealing of websites** web clarity and style *** website content***	Enjoyment*** Visual appealing of websites**** Website clarity and style**** Website content****
Perceived Service value	Accurate*** Relevant*** Up to date information dropped from quantitative study due to low factor loading Precise level of detail*** Save time*** Save money****	Accurate*** Relevant *** Up to date**** Precise level of detail*** Save time*** Save money***
Desirable outcome	Reduced corruption**** Equity*** Participation democracy*** Environmental sustainability***	Reduced corruption**** Equity*** Participation democracy*** Environmental sustainability***
Trust	Trustworthiness *** Credible information** Confidentiality of citizen information***	Confidentiality *** Credible information*** Confidentiality of citizen information*** Security***

Key

*represents insufficiently significance

** represent significance

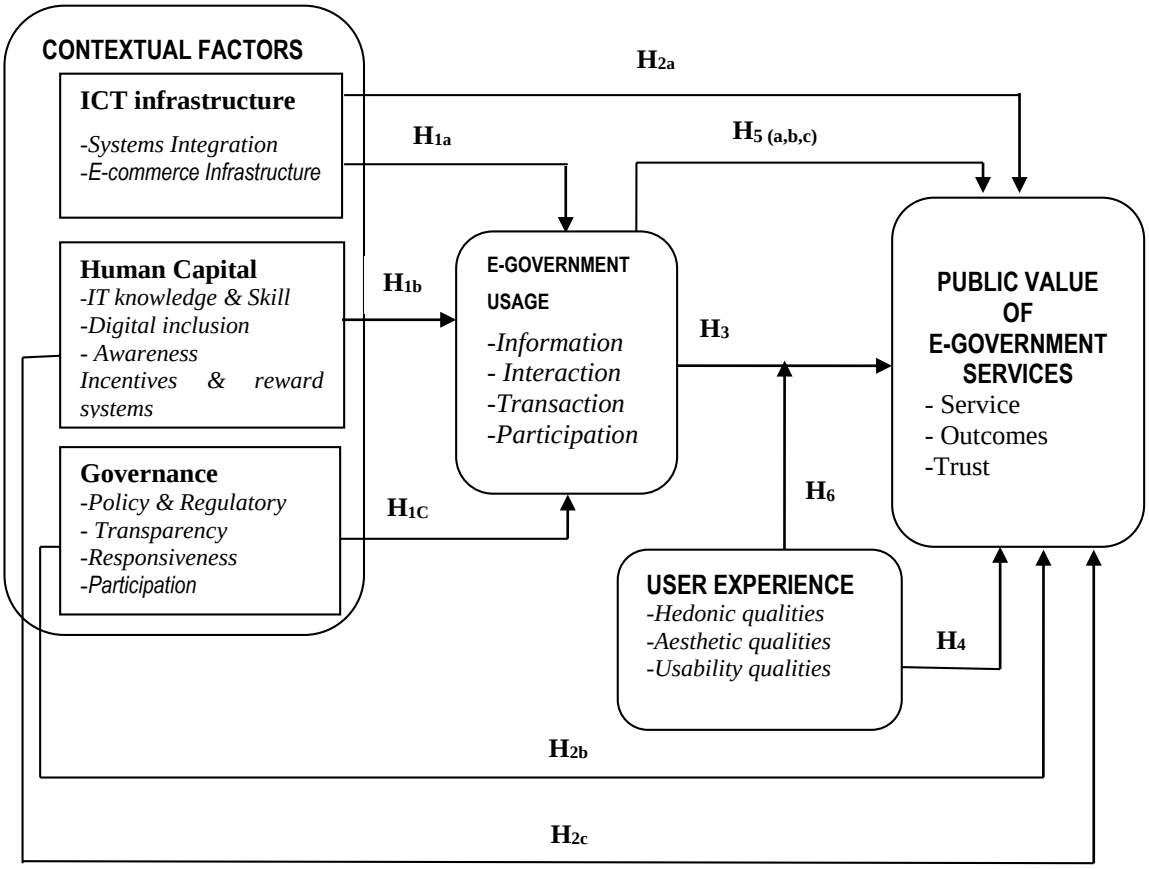
*** represent highly significance

**** represent very highly significance

6.5 A Revised Framework

As a consequence of the triangulated findings of both quantitative and qualitative data analysis aspects of this study, antecedents influencing the usage and the public value of e-government services were identified. Figure 6.1 shows the revised framework.

Figure 6.1: Revised Framework



The revised framework comprises of contextual factors namely ICT infrastructure, human capital and governance, which are further subdivided into sub-factors. ICT infrastructure related factors that influence e-government usage and the public value of e-government services include systems integration and e-commerce infrastructure. Human capital related factors comprise IT knowledge and skills, awareness, digital inclusion and provision of incentives and reward systems. Governance related factors include policy and regulatory framework, transparency, involvement in development of e-government services and government officers' responsiveness.

The public value of e-government services can be evaluated through; a) perceived service value that comprises up to date information, accuracy, understandable and simple information and perceived benefits of e-government services that entail time and cost saving. b) Desirable outcomes value that relates reduced corruption, equity, environmental sustainability, increased democracy c) Trust value that entails privacy and confidentiality of citizen's data and information, security infrastructure of e-government and credible information on government websites. Based on e-government services maturity stages, e-government usage types identified includes four distinct stages; published information, two-way communication, transactional services and participatory services. Table 6.2 presents a summary of indicators used in the framework.

Table 6.2: A Summary of indicators in the Framework

Main Dimension	Sub-Dimension	Indicators
Contextual Factors	ICT infrastructure	Systems integration e-commerce infrastructure
	Human Capital	IT knowledge and skills Awareness Digital inclusion Incentives and reward systems
	Governance	Sound policy and regulatory framework Transparency Participation Responsiveness
E-government usage	E-government usage	Published information Interaction Services Transactional services Participatory services
User Experience	Hedonic Attributes	Fun, enjoyment, pleasant
	Pragmatic Attributes	Efficiency, learnability, effectiveness, web functionality
	Aesthetic Attributes	Visual appealing of websites Website clarity and style
Public Value	Quality Services	Accurate information, Relevant information, Precise level of detail, Save time, Save money
	Desirable outcomes	Reduced corruption, equity, participation democracy Environmental sustainability
	Trust	Credible information, Confidentiality of citizen information, Security

The revised framework in Figure 6.1 has a number of inherent benefits over the prior proposed and existing frameworks for evaluating the antecedents of factors that affect the public value of e-government. The benefits consist of inclusion of several advanced ICT infrastructure, human and governance factors based on empirical outcome from both quantitative and qualitative threads of this study. In contrast to other frameworks (for example; Bai, 2013; Grimsley & Meehan, 2007; Karunasena & Deng, 2012; Osmani, 2014), the framework consists of a wide range of contextual factors that are related to public value of e-government services. The indicators proffered in the framework are accurate representations of what influence the e-government services public value in Kenya and other developing countries. Therefore, using the revised indicators of various constructs, new framework could be formulated for further evaluating the antecedents of the public value of e-government services in Kenya and other nations.

6.5 Chapter Summary

This chapter discussed the findings of data analysis from both qualitative and quantitative aspects of the study. The aim of the chapter was to present the key factors that influence citizens' usage of e-government services and the public value of e-government services. The discussion of the findings was based on the performance of independent and dependent constructs of the structural model of quantitative aspect of the study and results from thematic analysis of qualitative aspect of the study. For independent constructs, it was revealed that governance and human capital factors were found to have the greatest effect upon e-government usage and public value of e-government services.

Among the governance factors; policy and regulatory issue were found to have the highest effect followed by user participation or involvement, while for human capital factors knowledge and skills were predominant. However, quantitatively ICT infrastructure factors namely reliability, accessibility and availability were found to be insignificant. For dependent construct, the study found that trust of e-government services was the most influential predictor government of the public value of e-government services followed by desirable outcomes of e-government services. The chapter was wrapped up with presenting a revised framework that exhibits contextual factors that have an effect on the use and public value of e-government services.

CHAPTER SEVEN
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This chapter commences with providing the thesis summary followed by thesis conclusions. Then, the chapter delves on the study's theoretical and methodological contributions. Consequently, the chapter presents implications of the study on practice and policy. Finally, the study limitations are presented and an outline for future research put forward.

7.2 Summary of Findings

The thrust of this study was to investigate the association between contextual factors, e-government usage and public value of e-government services in Kenya. Through literature review, a gap in the evaluation of e-government services had been identified that had not been empirically addressed in the previous studies. The central purpose of the study was therefore to determine the effect of contextual factors (ICT infrastructure, human capital, governance) and user experience on the association between e-government usage and public value of e-government services in Kenyan context. To achieve the study objective, contextual factors were identified based on TOE theory, structuration theory and extensive literature review where a prior conceptual model was formulated (chapter two). Also, the study objective was achieved through use of mixed method research design that employed qualitative and quantitative research approaches. The quantitative thread of the study collected survey data from 315 respondents which equaled to a response rate of 78.75 percent. For qualitative thread, 9 people were interviewed. Analysis of quantitative data was conducted using SEM while theory driven thematic analysis was used to analyze qualitative data. Triangulation of results from both quantitative and qualitative threads of the study was conducted at data analysis stage.

The study was guided by six specific objectives which provided the direction of the research in general and specifically aided in the formulation of research hypotheses for the quantitative aspect of the research. Drawing from the statistical results of quantitative and qualitative facets of the study, the following section presents a synopsis of the research key findings.

The first objective of the research was to establish whether there was a relationship between contextual factors (ICT infrastructure, human capital, and governance), and e-government usage. Based on findings of both qualitative and quantitative aspects of the study, it was demonstrated that human capital and governance factors have a significance influence on e-government usage. The quantitative research found that human capital and governance to have a positive impact on e-government usage but revealed no effect of the relationship between ICT infrastructure and e-government usage.

The second objective of the research was to establish whether there was a relationship between contextual factors (ICT infrastructure, governance and human capital) and public value of e-government services. Drawing from findings of the qualitative and quantitative strands of this study, it was disclosed the public value of e-government services to be affected by human capital and governance factors. Specifically, quantitative research found human capital to have a negative influence on the public value of e-government services and governance a positive effect on the public value of e-government services.

The third objective of the research was to determine the association between e-government usage and e-government services public value. The findings of the quantitative thread of the study found a statistically significant but negative association between e-government usage and public value of e-government services. These findings demonstrate that the public value of online government services decreases with the move to higher stages of e-government services.

The fourth objective was to evaluate the connection between user experience and the public value of online government services. The results of the quantitative study found a positive association between user experience and the public value of e-government services that was statistically significant. This was supported by qualitative findings of the study which demonstrated public value to be related positively to user experience of e-government services.

The fifth objective was to determine the intervening effect of e-government usage on the relationship between contextual factors (ICT infrastructure, human capital, governance) and e-government services public value. The results of the research confirmed non-existence of mediation of e-government usage on the link between ICT infrastructure and public value of e-government services. However, the findings confirmed partial mediation of e-government usage on the association between human capital and public value of e-government services. Likewise, the findings confirmed partial mediation of e-government usage on the relationship between governance and public value of e-government services. These findings portrayed the relevance of human capital and governance in contributing to e-government usage and public value of e-government services. As noted in the literature, past studies evaluating e-government services mainly focused on technological factors but ignored the impact of human capital and governance.

Finally, objective six was to determine the moderating effect of user experience on the relationship between e-government usage and public value of e-government services. The results of this study revealed user experience moderated the relationship.

7.3 Conclusion

Previous studies on e-government have not been able to conclusively establish a strong association between contextual factors, e-government usage and public value of online government services. The literature review in the fields of public administration and information systems exposed that the equivocal results of the past studies could be attributed to the choice of dependent variables, lack of structured theoretical constructs, data availability and difficulties in modeling and evaluating the return of e-government initiatives.

The current study was devised with the overarching goal of investigating the role of contextual factors on e-government usage and public value of e-government services to mitigate some of the shortcomings pinpointed in the extant literature. The core of the research conceptual model was based on the Moore (1995) public value theory which postulates that the role of government is to provide public value. The research used the public value strategic triangle that posited that enabling environment is obligatory for

public value creation. In an endeavor to comprehend the factors that affect e-government services, the researcher advances the notion of public performance where the e-government services public value was taken as the endogenous variable. Applying the public value theory to evaluate e-government services created a robust evaluation model tailored for the public sector, conversely to NPM perspective which focused only on economic values. The public value perspective wraps all facets of government values that includes economic value as well as a set of desirable societal value such as outcomes, trust, and legitimacy (Rose, Persson, & Heeager, 2015). The research objectives were established from identified latent factors (ICT infrastructure, human capital and governance) drawn from TOE theory and linking them with latent public value factor. Thus, the study examined the relationship between contextual factors (ICT infrastructure, human capital and governance) and e-government usage, taking into account of user experience through public value lens in e-government context.

The study accomplished the research objective through the use of mixed methods approach informed by various theoretical models and theories drawn from different disciplines. The theories underpinning the theoretical models comprised of public value management, TOE theory, ANT theory and Structuration theory. E-government usage was theorized using e-government maturity models. The research employed SEM to test hypotheses from the empirical data for the quantitative strand of the study. Thematic analysis was used to analysis qualitative data.

Drawing from the study findings of both quantitative and qualitative aspects of the study; ICT infrastructure related factors; e-commerce infrastructure and systems integration, human capital related factors; ICT knowledge and skills, creating awareness of benefits and existence of e-government services, digital inclusion and provision of incentives and reward systems to e-government services users and governance related factors; policy and regulatory framework, citizens' involvement in government initiatives and developing citizen-centric systems were identified as key factors that had an effect on the usage and public value of e-government services. Therefore, the government and its agencies need to focus on these factors to increase the level of usage of e-government services as they are valued by the public.

7.4 Research Contributions and Implications

This study sought to bridge some theoretical and methodological voids acknowledged in the literature and also fill some practical and policy gaps.

7.4.1 Theoretical Contributions

The first contribution of this study relates to knowledge gap presented at the beginning of the thesis. While there has been notable advancement in information systems theories to research e-government, the relation between e-government and public value remains particularly under-theorised. This study claims paying attention on the discourse revolving around the relation between public value and e-government. In particular, this study emphasises the relation between contextual factors (ICT infrastructure, human capital, and governance), the usage and the public value of e-government services, an area that has received less attention in e-government research.

This study also contributes to the e-government theoretical realms through relating the concepts of public value theory with the contextual factors drawn upon using TOE theory and comprehensive literature review. The study is a point of departure in that public value of public services ought not to be considered as end objectives. The study developed a framework incorporating contextual factors; ICT infrastructure, human capital and governance linking them to e-government usage and the public value of e-government services. Hence, the study advanced knowledge in the field of e-government by developed the conceptual framework that offers a multi-perspective understanding of the motives behind the usage and the public value of e-government in the developing countries.

Further, the thesis makes a theoretical contribution by responding to call for e-government researchers to embrace the use of mixed theories from different disciplines to research e-government. The interdisciplinary approach was favored as there is no topic in IS that can be seen to be "pure" information systems (Walsham, 2012). This study positioned e-government is a socio-technical phenomenon at the crossroad of the domain of sociology, public administration and information systems. In essence, by deviating from academic work marked by domain-specific theories, the study is valuable in comprehending how the

value in e-government context is produced from a number of vantage points. Specifically, this study contributes to the e-Government research literature by providing new connections of theoretical elements from the fields of public administration, sociology and information systems. These connections between theoretical elements of public value theory, structuration theory, e-government maturity model and TOE theory provide a better insight into usage and evaluation of e-government services. This study shows that and public value theory, TOE theory and e-government maturity model can be utilized as a means to strengthen e-government uptake environment.

7.4.2 Methodological Contributions

Methodologically, this study expanded the scope of e-government research by using mixed methods approach to enlighten other e-government researchers on conducting other related studies. The study exposes the use of convergent concurrent mixed methods research strategy on e-government research to accomplish the exploratory and confirmatory research objectives by employing both quantitative and qualitative data. The convergent parallel mixed methods strategy was used to develop the research questions. Convergent parallel mixed methods strategy was also used to gather and analyze qualitative and quantitative data to realize the research objectives. The thesis offers a good case of evaluating e-government through the use of mixed methods approach to gain a comprehensive understanding of the research problem investigated.

In addition, drawing from methodological contribution, conducting the public value research principally entails measuring latent variables. Barney et al. (2001) contended that employing quantitative empirical investigations where proxies observed variables are used to represent latent constructs may be susceptible to construct validity. Whereas exploring latent constructs through qualitative approach are not appropriate at producing empirical robust conclusions. Hence, the study provided an excellent case of how the strengths of qualitative and quantitative approaches could be incorporated to study the public value of e-government.

7.4.3 Implications for Managerial Practice

The findings of this study shed light on some important issues associated to the public value of e-government that result to increased uptake of e-government services. Hence, the study offer practitioners, government officials and other decision makers in less economically endowed nations with a strategic instrument to aids them in the understanding of main issues that put off the public from using e-government services. For instance, by the study identified advanced ICT infrastructure factors such as systems integration and e-commerce infrastructure. The central implication of this to government and public officers is that working with value position, public officers who are arbiter of public value should acknowledge the value positions of citizens. Consequently, the public officers need to ingrain the citizens' value positions in policies and strategies of e-government development to enhance the uptake of e-government services.

Specifically, to boost e-government services usage in Kenya and other developing countries, the government should take into account the following steps: (1) develop ICT infrastructure that does not only incorporate basic ICT infrastructure features (availability, reliability and accessibility) but also focus on advanced ICT infrastructure comprising systems integration and e-commerce infrastructure. (2) E-government systems designers should pay attention to pragmatics, aesthetic and hedonic attributes when designing government websites and systems. Also, the government should embrace good governance in the process of developing e-governments services. This entails involving e-government citizens in the formulation of policies and legislations relating to e-government services. (3) The government needs to build citizens' capacity through training, creating awareness and providing incentive and reward systems to encourage citizens' embrace and make use of e-government services.

7.4.4 Implications for Policy

Extant literature as pronounced in this thesis demonstrates that establishment of a responsive e-government environment to the citizens' needs is a key challenge to policy makers. Although many governments worldwide have recognized the importance of ICTs in economic development and have instituted major steps to advance its use, e-government

success is dependent upon the willingness of citizens to use e-government services. Therefore, governments ought to give significant consideration to develop IS projects that transfer traditional services to the online platform. To achieve this objective the different stakeholders involved will need policy guidelines. The developed framework in this study consists of decomposed factors valued by the public and could aid policymakers in promoting e-government usage. This study posits that for e-government to successes, consistent intervention from the government is required. Such intervention is required in the area of strengthening the institutional environment and implementing strategies useful in designing and developing e-government services that meet the needs of the citizens.

7.5 Limitations of the Study

While this research yielded valuable insights pertaining public value of e-government services over and above the factors that affect the usage of e-government services, nonetheless it has certain limitations. The limitations result from the methodology employed, tools, the timing of the study and uncontrollable issues with the study units. The first limitation regards to generalizability of the findings to represent other developing nations. The sample of this study was drawn from e-government users within Kenya context. Cultural assumptions of a sample are arguably different from one country to another and thus, the results of this study may be limited to Kenya cultures. Replication of the current study might yield different findings.

The second limitation was that the analysis of this research was based on cross-sectional data. While the cross-sectional study is commonly used in e-government research due to inherent time and cost advantages, the cross-sectional study lacks the ability to explore certain aspects of citizens' value of e-government services as would be provided through data collected at different points over time.

7.6 Suggestions for Further Research

Merging of qualitative and quantitative findings results revealed new factors such as systems integration, e-commerce infrastructure, digital inclusion and provision of incentive and reward systems to e-government users affects the usage and the public value of e-government services. These new factors need to be validated.

This study examined various factors in respect to the public value of e-government services from prior users of e-government services. Whereas it is important to include end users with e-government experience. It is also essential to include end users that comprise a specific subset of users. For instance, e-government services regular users vs. non-users. This may aid to identify exceptions and constraints in cognizance to usage and value of e-government services.

The study employed a cross-sectional design, where a snapshot of data collection was used to complete the study investigation. To glean more insights into contextual factors and the public value of e-government services over time with the interactions between these factors. It would also be beneficial for future research adopt a longitudinal study. A longitudinal study may provide a better understanding of proposed constructs interrelationship and performance of the model. Particularly, longitudinal study increases internal validity of mediation analysis in research (Maxwell et al., 2011).

Also, the current research paid attention to e-government in the Kenyan context. The value of carrying out the study goes beyond the precincts of its specific context. The results of this research ought to be capable of enlightening e-government investments globally, particularly those in developing nations. Therefore, future research could be undertaken to replicate this study in other developing countries and validate the proposed new framework.

Further, in collecting qualitative data, the research collected qualitative data through interviewing individuals. New techniques such as Weblogs and focus groups could also be employed for future research involving e-government. Weblogs can provide an insight into user interaction with e-government services while focus group can provide a great discernment into participant's shared understandings.

Extant literature also indicates that e-government taxonomy entails four perspectives namely; government to citizen (G2C), Government to Employee (G2E), Government to Government (G2G), and Government to Business (G2B). This study focused on factors affecting the public value from G2C perspective. Further studies could apply the proposed framework to research on the same factors and deduce how they influence e-government usage and whether they are valued but focusing on different e-government perspectives.

Lastly, previous literature demonstrates that diverse theoretical lenses and research methodologies are generally employed in IS research. Each theoretical lens has its strengths and weaknesses. To guide this research structuration theory, public value theory and ANT and concurrent mixed method were relied on. Besides, these are not the only theories and research methodologies that could be used to explore the topic. Hence, in future, other theoretical lenses may be employed to explore the phenomenon in context and that may shed further radiance to the ongoing topic discourse. More so, the research vehemently recommends using different research strategies such as sequential mixed methods.

7.6 Chapter Summary

The chapters conferred the thesis findings summary derived from the research objectives. The chapter also presented the conclusion of the thesis and contribution of the study both to theory and methodology. The chapter then outlines practice and policy implications of the study. Finally, the research presented discussions on the study limitations that were subsequently followed by suggestions for further research.

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APPENDICES

Appendix 1: The Research Questionnaire

Introduction

This questionnaire aims to collect data on contextual factors, e-government usage, user experience and public value of e-government services in Kenya, for a PhD Thesis. You are requested to participate in the study by responding to the items given in the various sections as indicated. There is no right or wrong answers to the questions. The information provided shall be used for academic purpose only. Your participation in facilitating the study is highly appreciated. The information provided will be treated with utmost confidentiality

PART 1: BACKGROUND DATA

a) Kindly indicate your County (where you live/work)……

b) Kindly, indicate your gender.
Male □ Female □

c) Which of these age category do you fall into, please indicate one.
Between 18 - 25 □ 26-35 □ 36- 45 □ 46-55 □ Over 55 □

d) What is your highest educational level, kindly indicate one.
Primary School □ Secondary school □
Undergraduate degree □ Postgraduate degree □

Other, please specify……..

e) Which of the following type best describes your professional status?
Student □ Self employed □
Employed □ Others (Specify) ……

f) Which e-government services have you used in Kenya?
Please tick all the boxes that apply to you.
i) I-Tax Services □
ii) E-procurement services □
iii) HELB services □
iv) Online Public Service Job Application □
v) Online driving license application or renewal □
vi) Online Payment of services e.g. NHIF, NSSF □
vii) Other services: please specify

g) Where do you mostly access e-government services? Please tick one of the box that apply to you

At home	□	In the Office	□
Huduma centers	□	School/University	□
In Cyber café	□		

Others (please specify)……

h) Which device/s do you own?

Desktop computer	□	laptop	□
Mobile phone	□	Tablet/ipad	□

i) Please, indicate the device you mostly use to access e-government services

Desktop computer	□	laptop	□
Mobile phone	□	Tablet/ipad	□

Other (Please Specify)……

2a) . Contextual factor: ICT infrastructure

2a) In reference to e-government service(s) you have used, kindly indicate to what extent you agree with the following ICT infrastructure matters.

(Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent,

5 = to a great extent

Indicator	Statement	1	2	3	4	5
RE1	E-government sites performs services successfully upon first request					
RE2	E-government sites provide services in time					
AV1	E-government services are available 24/7.					
AV2	Adequate resources are available e.g, huduma centres, internet connections to access e-government services.					
AV3	Geographical location does not influence e-government services accessibility through the internet					
AC1	E-government services are accessible using different devices such as cell phone, personal computer, ipads					
AC2	E-government websites provides different standards to support individuals with special needs (e.g. visual, hearing impairments)					

Contextual factor: Human Capital

2b (i) To what extent do you agree with the following statements regarding your knowledge and in reference to the computer, internet and e-government services?

(Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent, 5 = to a great extent

Indicator	Statement	1	2	3	4	5
SK1	I have the necessary training on how to use computers.					
SK2	I have adequate ICT skills on how to use Internet services					
SK3	I have training on the Internet services use					
SK4	I can access e-government services with no assistance					

2b (ii). How frequently do you visit e-government sites? Please tick one of the box that apply to you.

i) Almost daily □

ii) At least once a week □

iii) About once a month □

iv) Several times in month □

v) About once a year □

2b (iii). How long have you been using the e-government services? Please tick one of the box that apply to you.

i) Less than 6 months □

ii) 6 months to less than 1 year □

iii) 1 year to less than 3 years □

iv) 3 years to less than 5 years □

v) 5 years or more □

2c). Governance

2c). In reference to e-government services, please indicate the extent to which you agree or disagree with the following governance statement.

Tick (√) on the scale: 1= strongly disagree 2= disagree, 3=neutral, 4, agree, 5 = strongly agree

Indicator	Statement	1	2	3	4	5
PR1	Online information held by different public organization systems is safe/secure					
PR2	Confidentiality of e-government services is ensured.					
PR3	Privacy statement on the on how to use e-government services presented on the websites					
PR4	Security policy is well stated on e-government websites					
TO1	Government organizations adhere to their citizens online charter					
TO2	Public organizations display their contact information online					
TO3	Online case tracking for e-government services is present (e.g. "status of an application submitted to government agencies")					
PD1	Citizens are involved in formulating policies and laws related to e-government services					
PD2	E-government services offer public opportunity to participate in decision making					
PD3	Citizens can make complaints online					
PD4	Government official responds to online submissions and emails on time					

3. E-GOVERNMENT USAGE

3. In reference to e-government usage, state how often you use the following e-government services?

Tick (√) on the scale
1. Never
2. Once to less than 5 times a year
3. More than 5 times a year to about one's a month
4. about once a week
5. Almost every day

Indicator	Statement	1	2	3	4	5
IG1	Read published government information online					
IG2	Conduct information search for government services					
IG3	Download forms from government portals					
TG1	Use of interactive online forms (i.e. completing and sending government forms online)					
TG2	Make online payment to government organizations					
TG3	Filing tax returns online					
TG4	Fill electronic application e.g. passport and national ID cards					
TG5	Pay bills online e.g. electricity, NSSF etc					
PG1	Communicate with government institutions through E-mails					
PG2	Participate in online discussions and forums on government matters					
PG3	Use government websites to participate in online surveys					
PG4	Participation in online democratic decision making					
	Any other form of government services you access online					
1						
2						
3						
4						

4. USER EXPERIENCE

4. In reference to e-government services, indicate the extent to which you agree with the following statement.
   (Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent, 5 = to a great extent

Indicator	Statement	1	2	3	4	5
XH1	I find using the e-government websites enjoyable					
XH2	Using the e-government websites is pleasant					
XH3	I am frustrated when using e-government services					
XA1	The sites that provide e-government websites visual appealing					
XA2	Most e-government websites background color is clear					
XA3	The content of e-government services is understandable					
XA4	The structure of e-government services platform well organized					
US1	Government websites provides links that are easy to use.					
US2	Users are kept informed on the errors when using e-government services					
US3	The web services help to correct errors					
US4	Links of e-government service websites descriptive					
US5	Feedback of e-government services is immediate					

5. THE PUBLIC VALUE OF E-GOVERNMENT SERVICES

5a) In reference to your recent use of e-government services, please indicate the extent the following perceived value of e-government services is evident or clear.

(Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent, 5 = to a great extent

Indicator	Statement	1	2	3	4	5
SV1	Information from e-government services is accurate					
SV2	Information from e-government services is up to date					
SV3	Information from e-government services is reliable					
SV4	Information having the right level of detail					
SV5	Online delivery of government services save time.					
SV6	Using e-government services save money					

5b). In reference to use of e-government services, please indicate the extent to which you agree with the following outcomes of e-government services.

(Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent,

5 = to a great extent

Indicator	Statement	1	2	3	4	5
OV1	Use of e-government services reduces corruption					
OV2	Accessing public services through e-government services creates fairness/equity					
OV3	Provision of government services online increases government transparency					
OV4	Public participation in decision making is enhanced through online services delivery					
OV5	Online government services has resulted in reduced environment pollution					

5c). In reference to your use of e-government services, please indicate the extent to which you agree with the following statement.

.

(Tick (√) on the scale: 1= Not at all, 2 = to a less extent, 3 = moderately, 4 = to a high extent,

5 = to a great extent

Indicator	Statement	1	2	3	4	5
TV1	Privacy is assured when using e-government services					
TV2	Information is provided on e-government websites is not wrongly used.					
TV3	Public organizations protect information in custody of e-government systems					
TV4	Information disseminated through e-government websites is credible					

5d). What should the government do improve the usage and value of e-government services?

Thank you for your time

Appendix II: Interview Guide

Section One: Part One

1. Have you even used e-government services? **(Screening question)**

2. Demographic information

a) What is your age group?
b) What is your position/occupation?

Section Two
Contextual Factors

a) What can you say about the reliability, availability and accessibility of e-government services infrastructure in Kenya?
b) What can you say about your knowledge, skills and IT experience on the use of e-government services?
c) What can you say about the legal and policy frameworks, security and privacy and effectiveness of e-government services?
d) How do you think the government should do to improve the delivery of public service?
e) How do you value that you think contribute to usage of e-government services.

U-government Usage

f) What types of government services do you access online?

User Experience

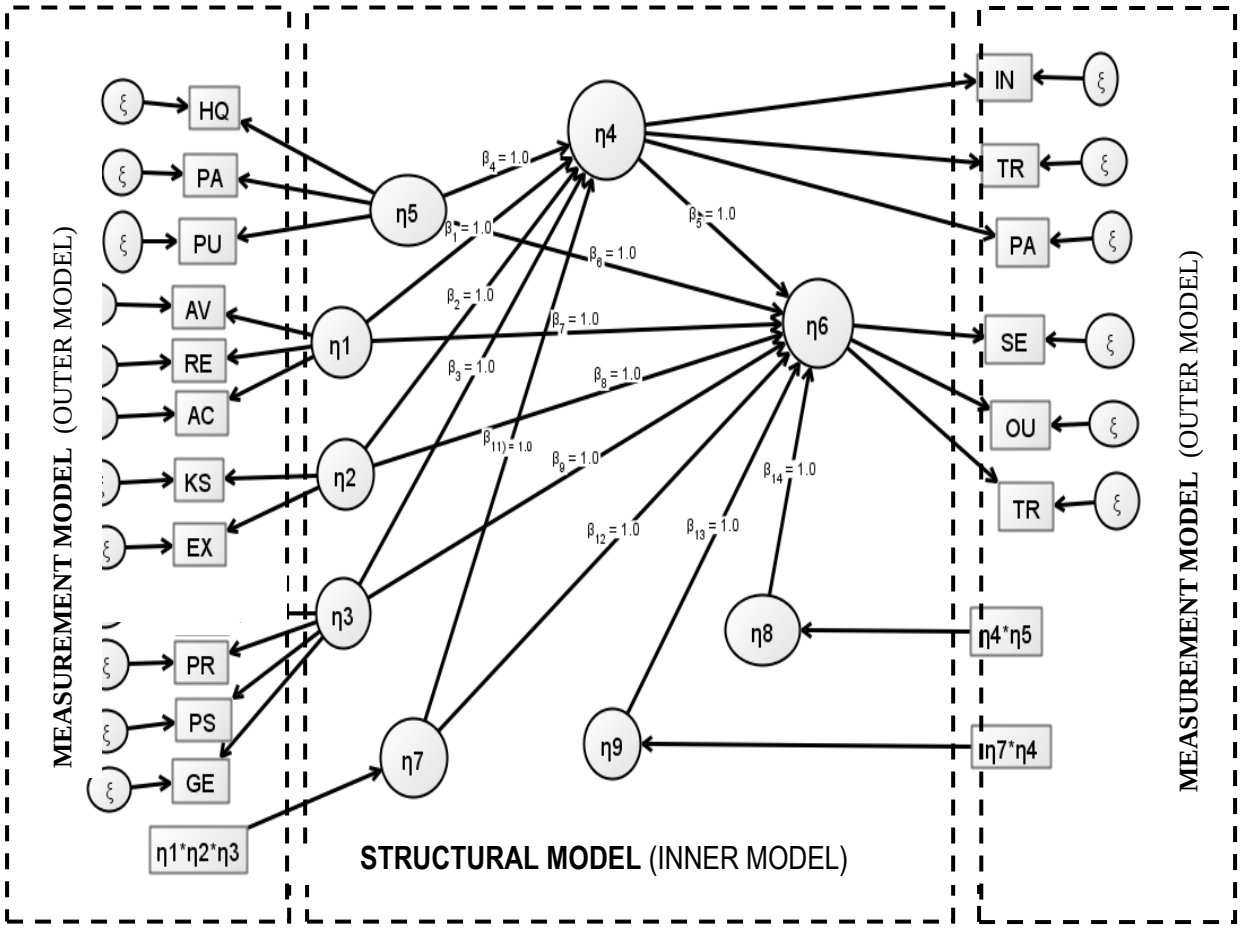
g) What your perception on the use of e-government services before, during and after use? "E-services, channels, and usability features of public service delivery channels".

Public Value

h) What make you use e-government services?
i) Do you value from delivery of quality public service through e-government?
j) What are some of the outcomes do you anticipate from e-government?
k) What do you think government has been able to achieve through provision of services online?
l) How is building trust through e-government valuable to you and to your society?
m) What are some factors that may make you not trust e-government services?

Appendix III: SEM Data Modeling Diagram

Figure (a) : SEM Data Modeling Diagram



Structural Equation Model

AV=Availability, **RE**=reliability, **AC**=accessibility, **KS**=Knowledge and Skill, **EX**=Experience, **P**R=Policy and Regulatory, **PS=**Participation, **GE**=Transparency, **HQ** =Hedonic Qualities, **PA**= Pragmatic Aesthetic Qualities, **PU**= Pragmatic Usability Qualities, IN=Information, **TR**=Transaction, **PA**=Participatory. **SE**=Services, **OU**=Outcomes, **TRU**=Trust, **Ƞ1**=ICT infrastructure **Ƞ2**=Human Capital**,** **Ƞ3**=Governance**, Ƞ4**=E-government Usage**, Ƞ5**=User Experience**, Ƞ6**=Public Value of E-government services, **β**=Path Coefficient

Appendix IV: Skewness and Kurtosis

	N	Skewness	Kurtosis
	Statistic	Statistic	Statistic
Egov services perform successfully after first request	315	-.252	.439
E-government sites provide services in time	315	-.055	-.149
E-government services are available 24/7	315	-.644	-.277
Adequate resources are available	315	-.469	-.480
Egov services perform successfully after first request	315	-.306	.539
necessary training on how to use computers.	315	-.671	-.100
adequate ICT skills on how to use Internet services	315	-.305	-1.105
training on internet service use	315	-.552	-.467
accessing e-government services with no assistance	315	-.634	-.797
Online information held by different public org safe	315	-.659	.195
Confidentiality of e-government services is ensured.	315	-.662	.580
Privacy statement on the use of e-government services provided on the websites	315	-.460	.005
Security policy clearly stated on gov websites	315	-.278	-.224
Government organizations adhere to their citizens online charter	315	-.038	-.214
Public organizations display their contact information online	315	-.843	.442
online tracking of eGov services present	315	-.586	-.296
Citizens are involved in formulating laws and policies related to e-government services	315	.199	-.464
E-government services offer public opportunity to participate in decision making	315	.030	-.469
Citizens can make complaints online	315	-.096	-.525
Government official responds to online submissions and emails on time	315	.415	-.397
Read gov information online	315	.514	-.626
Conduct information search for government services	315	.710	-.601
Download forms from government portals	314	.458	-.703
Use of interactive online forms	315	.918	.403
Make online payment to government organizations	315	.094	.075
Fill tax return online	315	.740	-.453
fill electronic application e.g passport, ID	315	1.176	.764
Communicate with gov through emails	315	.685	-.455
Participate in online discussions and forums on government matters	315	.872	-.084

Use government websites to participate in online surveys	315	.979	-.195
Participation in online democratic decision making	315	1.009	.003
I find using the e-government websites enjoyable	315	1.054	-.003
Using the e-government websites is pleasant	315	-.391	-.384
The sites that provide e-government websites visual appealing	315	-.341	-.530
Most e-government websites background color is clear	315	-.345	-.362
The content of e-government services is understandable	315	-.305	.233
The structure of e-government services platform well organized	315	.034	-.202
Government websites provides links that are easy to use	315	-.123	-.259
Users are kept informed on the errors when using e-government services	315	-.010	-.184
Links of e-government service websites descriptive	315	.250	-.344
Feedback of e-government services is immediate	315	.231	-.688
Information from e-government services is accurate	315	-.748	.488
Information from e-government services is reliable	315	-.286	-.065
Information having the right level of detail	315	-.509	.168
Online delivery of government services save time.	315	-1.072	.814
Using e-government services save money	315	-1.023	.374
Use of e-government services reduces corruption	315	-1.190	.867
Accessing public services through e-government services creates fairness/equity	315	-.837	.531
Provision of government services online increases government transparency	315	-.883	.953
Public participation in decision making is enhanced through online services delivery	315	-.775	.605
Online government services has resulted in reduced environment pollution	315	-1.103	.841
Privacy is assured when using e-government services	315	-.578	.040
Information is provided on e-government websites is not wrongly used.	315	-.287	-.139
Public organizations protect information in the custody of e-government systems	315	-.421	.354
Information disseminated through e-government websites credible	315	-.358	-.070
Valid N (listwise)	314		

Appendix V: Inter-total Correlation of Items and Co-efficient Alpha

Indicator	Statement	Inter- total correlation	Coefficient alpha
	ICT infrastructure		0.805
RE1	E-government sites performs services successfully upon the first request	0.744	
RE2	E-government sites provide services in time	0.721	
AV1	E-government services are available 24/7.	0.471	
AV2	Adequate resources are available e.g, huduma centres, internet connections to access e-government services.	0.544	
AC1	E-government services are accessible using different devices such as cellphone, personal computer, ipads	0.479	
	Human Capital		
SK1	I have the essential training on how to use computers.	0.758	
SK2	I have adequate ICT skills on how to use Internet services	0.708	
SK3	I have training on the Internet services use	0.734	
SK4	I can access e-government services with no assistance	0.761	
	Governance		0.807
PR1	Online information held by different public organization systems is safe/secure	0.424	
PR2	Confidentiality of e-government services is ensured.	0.440	
PR3	Privacy statement available on e-government websites	0.410	
PR4	The security policy is evidently affirmed on government websites	0.550	
TO1	Government organizations adhere to their citizens online charter	0.578	
TO2	Public organizations display their contact information online	0.550	
TO3	Online case tracking for e-government services is present (e.g. condition of an application presented to government organization)	0.497	
PD1	Citizens are involved in formulating policies and laws relating to e-government services	0.349	
PD2	E-government services offer public opportunity to participate in decision making	0.474	
PD3	Citizens can make complaints online	0.514	
PD4	Government official responds to online submissions and emails on time	0.354	
	E-government usage		0.791
IG1	Read published government information online	0.332	
IG2	Conduct information search for government services	0.433	
IG3	Download forms from government portals	0.470	
TG1	Use of online interactive forms (for example. completing and sending online government forms)	0.544	
TG2	Make online payment to government organizations	0.524	
TG3	Filing tax returns online	0.557	
TG4	Fill electronic application e.g. passport and national ID cards	0.524	
PG2	Participate in online discussions and forums on government matters	0.529	

PG3	Use government websites to participate in online surveys	0.630	
PG4	Participation in online democratic decision making	0.594	
	User experience		0.751
HX1	I find using the e-government websites enjoyable	0.560	
HX2	Using the e-government websites is pleasant	0.561	
HX3	The sites that provide e-government websites visual appealing	0.457	
HX4	Most e-government websites background color is clear	0.525	
	The content of e-government services is understandable	0.620	
PX1	The structure of e-government services platform well organized	0.618	
PX2	Government websites provides links that are easy to use.	0.518	
PX3	Users are kept informed of the errors when using e-government services	0.534	
PX4	The web services help to correct errors	0.567	
PX5	Links to e-government service websites descriptive	0.625	
PX6	Feedback on e-government services immediate	0.381	
	Services Value		0.851
SV1	Information from e-government services is accurate	0.560	
SV2	Information from e-government services is up to date	0.561	
SV3	Information from e-government services is reliable	0.457	
SV4	Information having the right level of detail	0.542	
SV5	Online delivery of government services saves time.	0.628	
SV6	Using e-government services save money	0.591	
	Outcome Value		0.836
OV1	Use of e-government services reduces corruption	0.738	
OV2	Accessing public services through e-government services creates fairness/equity	0.707	
OV3	Provision of government services online increases government transparency	0.582	
OV4	Public participation in decision making is enhanced through online services delivery	0.632	
OV5	Online government services has resulted in reduced environment pollution	0.544	
	Trust		0.821
TV1	Privacy is assured when using e-government services	0.644	
TV2	Information is provided on e-government websites is not wrongly used.	0.622	
TV3	Public organizations protect information held in e-government systems	0.681	
TV4	Information disseminated through e-government websites is credible	0.653	

Appendix VI: Scree Plots for EFA Results

Figure (a): Scree Plot for EFA of ICT infrastructure

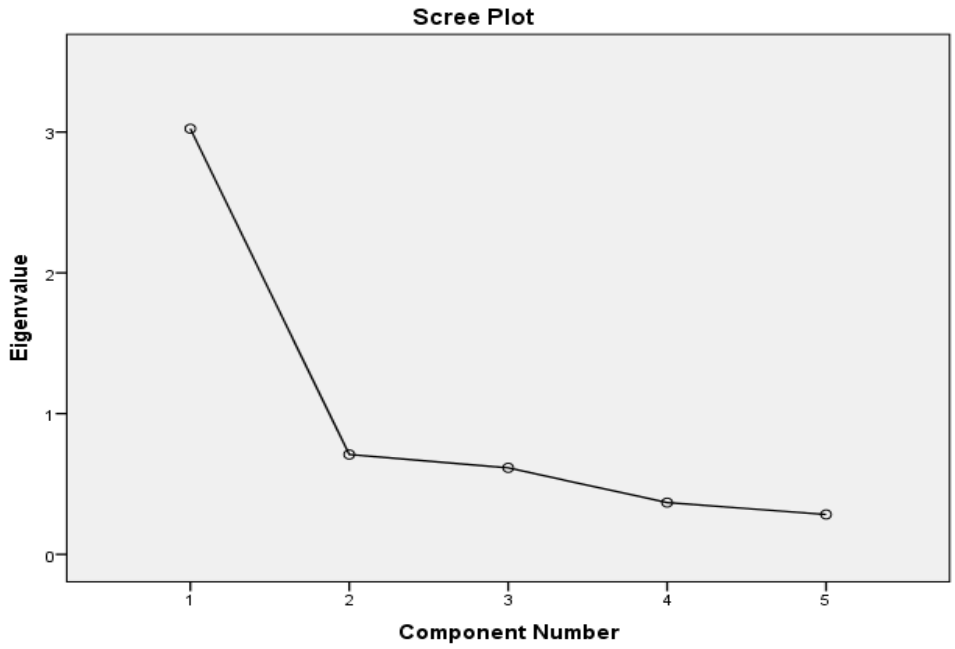


Figure (b): Scree Plot for EFA of Human Capital

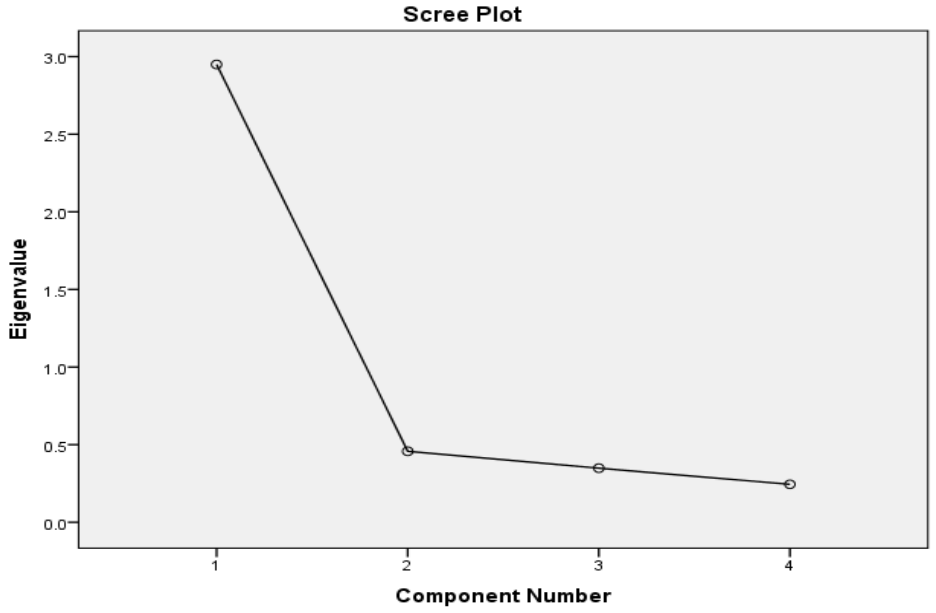


Figure (c): Scree Plot for EFA of Governance

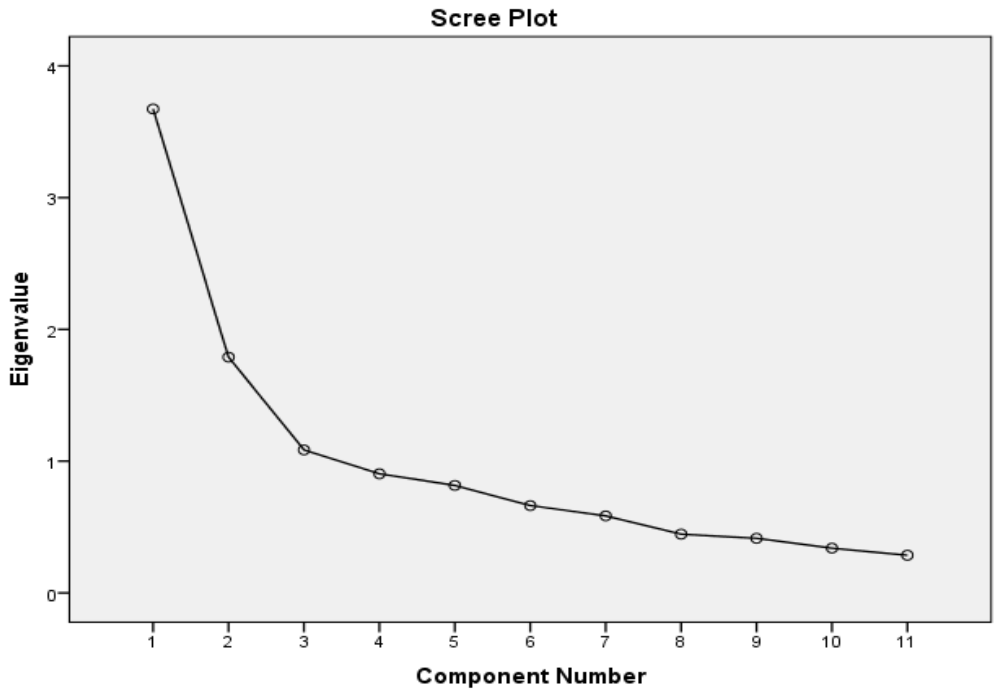


Figure (d): Scree Plot for EFA of E-government Usage

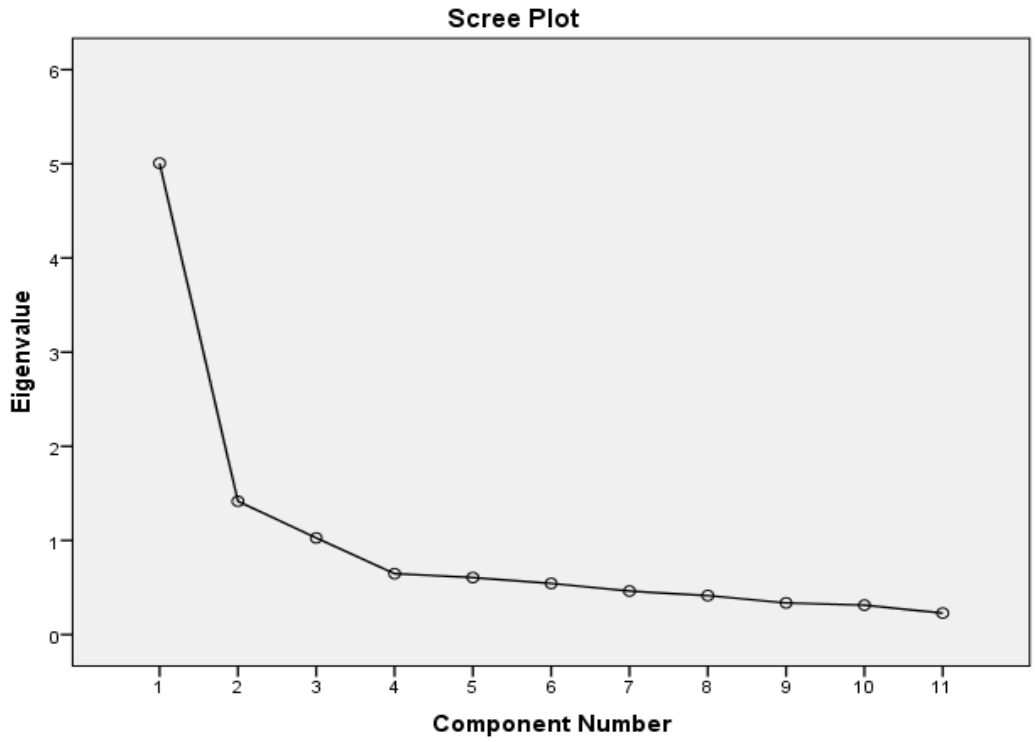


Figure (e): Scree Plot for EFA of User Experience

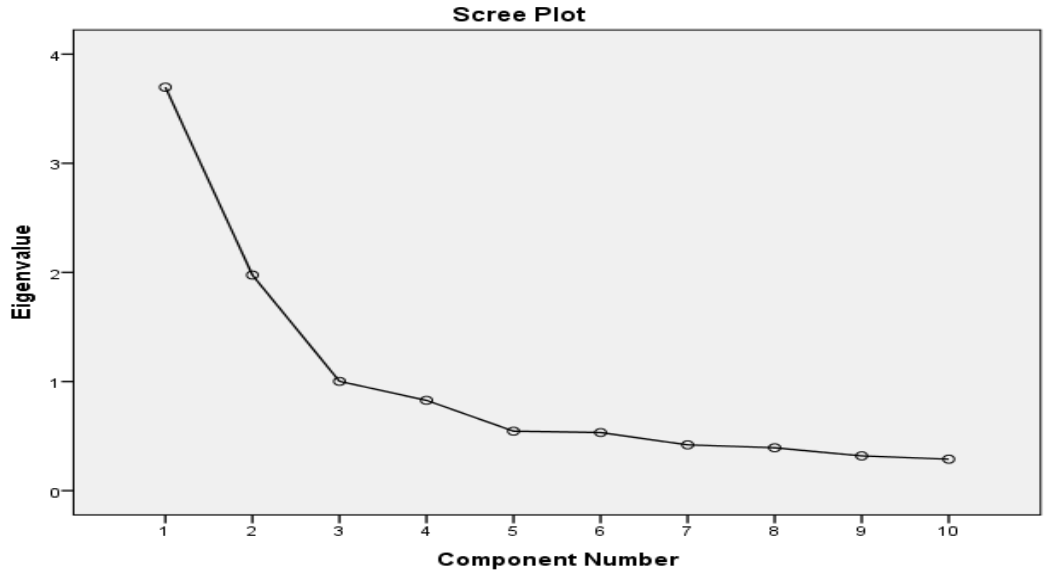
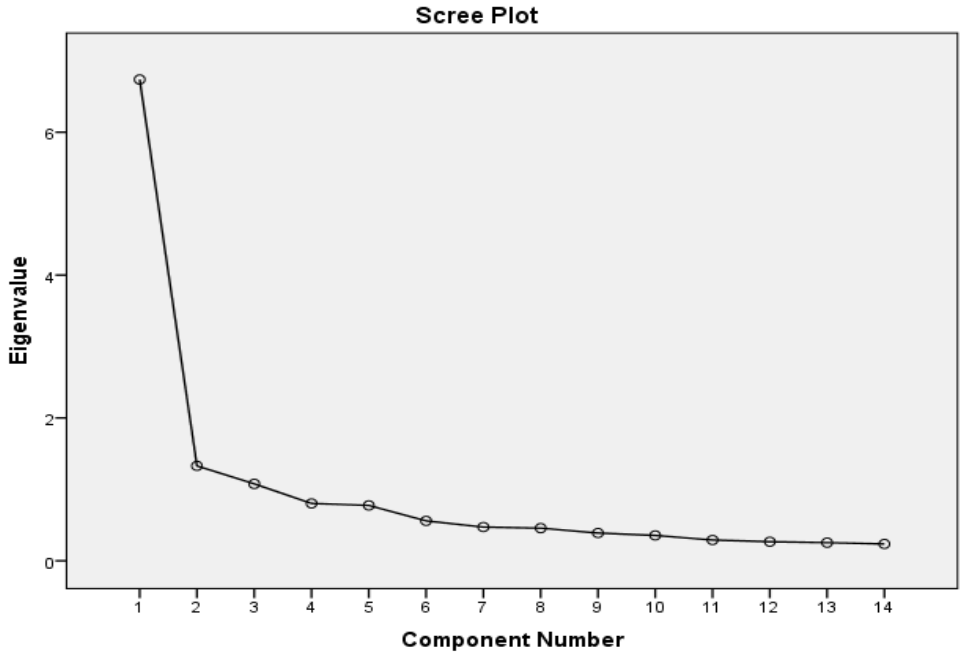


Figure (f): Scree Plot for EFA of Public Value of E-government Services



Appendix VII: Authorization Letter from University of Nairobi to Conduct Research

UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
SCHOOL OF BUSINESS
DOCTORAL STUDIES PROGRAMME

Telephone: 4184160/1-5 Ext. 225
Email: dsp@uonbi.ac.ke

P.O. Box 30197
Nairobi, Kenya

21st April, 2016

TO WHOM IT MAY CONCERN

RE: GABRIEL NDUNG'U KAMAU::D80/60424/2011

This is to certify that, **GABRIEL NDUNG'U KAMAU:D80/60424/2011** is a Ph.D candidate in the School of Business, University of Nairobi. The title of his study is: **"Contextual Factors and Public Value of E-government Services in Kenya".**

The purpose of this letter therefore, is to kindly request you to assist and facilitate in carrying out the research/study in your organization. A questionnaire is herewith attached for your kind consideration and necessary action.

Data and information obtained through this exercise will be used for academic purposes only. Hence, the respondents are requested not to indicate their names anywhere on the questionnaire.

We look forward to your cooperation.

Graduate Studies Co-ordinator P. O. Box 30197 NAIROBI College of Humanities & Social Science Faculty

DR. JOHN YABS
FOR: ASSOCIATE DEAN,
GRADUATE BUSINESS STUDIES
SCHOOL OF BUSINESS

JY/nwk