Framework for e-governance to improve service delivery for local authorities in South Africa

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PREFACE

Let me take this opportunity to thank “the God of Major 1” who has made my PhD journey possible and on this day I am saying, “I am raising my Ebenezer”.

I would like to give thanks to my family; to my mother, Frascia Muridzi, and to my sisters, Rudo, Everjoy and Chipo, who supported me both financial and spiritually. I vividly remember my child asking me, “Daddy what kind of learning is this? You are always busy with your books and you have no time to rest.”

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Opinions expressed and conclusions of this study are those of the author and are not necessarily to be attributed to the North West University.

ABSTRACT

E-governance is the use of Information and Communication Technologies (ICT) by the public sector with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. There is slow usage and uptake of e-governance initiatives by citizens despite the interactive features available on the internet. The aim of this study is to examine and explain the uptake and usage of ICT by citizens, assess and explain the services offered to citizens, and examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa.

The increased use of ICT as part of e-governance has given birth to new governance in South Africa municipalities for better service delivery to citizens. This study uses the Technology Acceptance Model, the Synthesized Stage Model and the Interactive-Service Model to establish the uptake and usage of ICT by citizens. Mixed method research was conducted through questionnaires and interviews from three (3) Metropolitan Municipalities and three (3) Local District Municipalities in the Gauteng Province of South Africa. 600 questionnaires were distributed to citizens and six (6) executive members from municipalities were interviewed.

Data collected through questionnaires was analysed using Statistical Package for the Social Sciences software. Factor analyses were performed on internet usage and connectivity, municipality services, service delivery output, impact of e-governance and e-governance outcome. Data from interviews was analysed using Atlas.ti 7 and eleven (11) themes emerged. Results of quantitative study found that respondents who participated in the study have the same knowledge on the use of ICT tools as part e-governance. Results of qualitative study revealed that e-governance should be looked at through the lens of a full ecosystem that enables citizens, business and Small to Medium Enterprises to interact with government using full range of electronic media. The study found that Metro Municipalities in South Africa are implementing e-governance as a full ecosystem by investing in ICT through various applications and platforms that allow citizens to access online services from municipalities. Results indicated that Metro Municipalities in South Africa are taking a new landscape by moving from just ‘governance’ to ‘e-governance’ by allowing public participation through technology and engaging Public-Private-Partnership in rolling out ICT initiatives.

Results from this research contribute to the body of knowledge for low uptake and usage of ICT by citizens at local government level in South Africa by providing an insight into the underlying challenges. The study provides a theoretical and practical insight on factors why local authorities are offering poor service delivery to their citizens in South Africa. The study also assesses the relevance and validity of e-governance and e-government theories and practice in service delivery in South Africa. The study managed to develop an e-governance framework for improving service delivery for local authorities in South African context.

Key words: ecosystem, e-governance, Information Communication Technology, Small to Medium Enterprises

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LIST OF ACRONYMS

Acronym	Meaning
AJA	Administration Justice Act
ANOVA	Analysis of Variance
CAFRAD	Africa Training and Research Centre in Administration for Development
C2G	Citizens to Government
CGeG	Common Wealth Centre for e-governance
COJ	City of Johannesburg
CRM	Customer Relation Management
DOI	Diffusion of Information
EDA	Exploratory Data Analysis
EGDI	E-government Development Index
ENaTIS	Electronic National Traffic Information System
FOI	Freedom of Information
G2C	Government to Citizens
G2C2G	Government to Citizens to Government
G2E	Government to Employees
G2G	Government to Government
GIS	Geographical Information System
HCI	Human Capital Index
HU	Hermeneutic Unit
ICT	Information Communication Technology
IDP	Integrated Development Plan
ITU	International Telecommunication Union
KMO	Kaiser-Meyer-Olkin
NGO	Non-Governmental Organisation

OSI	Online Service Index
RDP	Reconstruction and Development Programme
SMART	Simple, Moral, Accountable, Responsible and Transparent
SME’s	Small to Medium Enterprises
SMS	Short Message Services
SOTA	Secure Online Transaction Algorithm
SPSS	Statistical Package for the Social Sciences
SSL	Secure Socket Layer
TAM	Technology Acceptance Model
TII	Telecommunication Infrastructure Index
URCOT	Union Research Centre on Organisation and Technology
WPTPS	White Paper on the Transformation of the Public Service of 1995
WTO	World Trade Organisation

CHAPTER 1: INTRODUCTION

1.1 Motivation for undertaking this study

The purpose of this research is to develop an e-governance framework that improves service delivery for local authorities in South Africa. This was done by assessing and explaining what Information Communication Technology (ICT) tools can do in promoting e-governance and improving service delivery in local authorities in South African context.

E-government as a part of e-governance refers to increase efficiency and effectiveness of service delivery by the Government to Citizens (G2C) of different portions of society and administrative activities through ICT (Rahman, 2016). Irafan (2017) argued that e-governance provides an effective service delivery of different public services, which provides easy to access services, such as online application filing, bill payments, online education, telemedicine etc. E-governance contributes towards effectiveness, efficiency and equity in public services that further enhances the quality of public service delivery (Pathak, Singh, Belwal, Naz & Smith: 2008). Irafan (2017) expressed that e-governance is the way to empower the good governance and it will allow citizens at grassroots level to interact with the government at all levels. This study therefore seeks to improve service delivery through the use of e-governance in local authorities.

Jain and Sharma (2007) contend that “e-governance is the public sector’s use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. E-governance involves new styles of leadership, new ways of debating and deciding policy and investment, new ways of accessing education, new ways of listening to citizens and new ways of organizing and delivering information and services. E-governance is generally considered as a wider concept than e-government, since it can bring about a change in the way citizens relate to governments and to each other. E-governance can bring forth new concepts of citizenship, both in terms of citizen needs and responsibilities. Its objective is to engage, enable and empower the citizen (Jain & Sharma, 2007). This study therefore adopted this definition as it has highlighted key concepts of e-governance which was considered during the designing of the conceptual framework.

Prabhu (2012) explained that e-governance is the latest trend in the governance process all over the world. Prabhu (2012) further argued that good governance can be enabled by e-

governance if appropriately implemented. Good governance will be SMART (Simple, Moral, Accountable, Responsive and Transparent) governance which is so essential today in countries all over the world (Prabhu, 2012). Prabhu (2012) further expressed that developed nations of the world such as USA, the UK, Canada, Australia, and Singapore have gone in a big way into e-governance. Developing nations like India, China, Sri Lanka, the Philippines, Brazil have also progressed well in e-governance implementation (Prabhu, 2012). It is therefore important for African countries such as South Africa to start and continue embracing e-governance initiatives to improve governance and subsequently the service delivery to citizens.

Flak, Olsen and Wolcott (2005) expressed that in South Africa and other countries, local authorities are the government level that has the most direct contact with the citizens and businesses and is responsible for providing an array of basic services (Flak, et al., 2005). Flak, et.al. (2005) highlighted that over the last two decades, the South African government has instituted several e-governance initiatives in order to try to improve the internal processes, service delivery and the overall efficiency of local authorities. The provisions of online public services are used increasingly in order to streamline and facilitate contact between residents and public-sector bodies (Cernakova, 2015).This study therefore focused its attention on six municipalities in Gauteng Province in order to understand the uptake and usage of ICT by citizens at a local authority level in South Africa and to understand the services being offered by such municipalities to their citizens.

The rapid advancements in ICT have led to transformations in the way businesses and governments deliver services to customers and citizens respectively (Amagoh, 2015).The government of South Africa has therefore committed itself to introduce ICT initiatives in offering services to its citizens. Ntetha and Mostert (2011) further urged that South African government has initiated several ICT initiatives to enable its departments to improve and speed up service delivery to the public. The South African e-governance programme also extends to local government level, where the best examples are seen implemented in the metropolitan municipalities of Cape Town, Johannesburg, Ekurhuleni, Tshwane and eThekwini (Cloete, 2011).Cloete (2011) further explained that government departments have therefore been endowed with a number of ICT tools to assist in this e-governance process. Amagoh (2015) further argued that globally, governments have embraced electronic governance (e-governance) as the best mechanism through which they can more effectively respond to the needs and demands of their citizens. Thus, when properly implemented, e-

governance should aim to bring citizens and businesses closer to government (Sun, Ku & Shih, 2015).

Various countries have deployed different forms of e-governance, with developed countries at higher stages of development (Amagoh, 2015). Amogoh (2015) expressed that for developing countries (most of which are in Africa), e-governance deployment is still in its early stages. However, adoption of more advanced forms of e-governance has the potential to promote civic engagement by empowering citizens to interact with government officials in a more transparent manner, thereby reducing opportunities for corruption (Bannister & Connolly, 2015).

Despite the South African government's well-intended reform policy and service delivery initiatives, economic and social disparities still perpetuate (Lesame, 2014). Mda (2014) emphasizes that the rich versus poor inequality is as glaring in 2014 as it was in 2007, when former president Mbeki announced that South Africa is country with two economies—a developed economy serving the rich and another undeveloped economy serving the poor. "Democracy has failed to level the economic playing field" (Mda, 2014). While there has been some success noted, for example South Africa was ranked 93 out of 193 United Nations member states (United Nations e-government survey, 2014), there are a number of areas in which inequalities prevail—the chronic digital divide is one such area (Lesame, 2009; Chisango, 2013).

The digital divide is a phenomenon linked not only to the access to new technologies, such as computers and the internet, but also to unequal access to and usage of new technologies (Funchs & Horak, 2008). Lesame (2014)argued that tthe issue of inequality is connected to the topic of the digital divide because technology is one aspect of material wealth, and wealth production is more and more often based on technology and knowledge. Lesame (2014) suggested that in South Africa those without material wealth have no ICT access and use, and therefore no access to education and knowledge. It is therefore the objective of this study to develop a framework for e-governance that will take cognisance of the digital divide that currently exists in South Africa. It is envisaged that the proposed framework will incorporate aspects to bridge the digital divide in South Africa, such as the availability of hotspots for free Wi-Fi, education and training and many other initiatives that will promote uptake and usage of e-governance.

1.2 Background to the study

South African government has committed itself to introduce effective ICT-driven services to the public (Ntetha & Mostert, 2011) as part of e-governance initiatives. Ntetha and Mostert (2011) pointed out that heavy investment in both physical resources and modern ICT infrastructure has been made, but the public is still not convinced that they have benefited to the extent envisioned by the government and therefore the need to research further and to develop a framework that improves service delivery in local authorities in South Africa.

1.2.1 South African social realities

The extent and effectiveness of service delivery are influenced by societal contextual realities and the needs of the client base (Schwella, 2001).Schwella (2001) further outlined that South Africa is often described as a world in one country, characterized by diversity, pluralism, and inequality. Schwella (2001) demonstrated that in conjunction with diversity and pluralism, this has contributed to the deeply divided and unequal state of South African society. Service delivery in South Africa is therefore affected by societal context and the diverse needs of the client base (Schwella, 2001). It is against this background that the researcher sees it fit to find ways of examining the role of ICT as part of e-governance and to develop a framework in a bid to improve service delivery, given the digital divide which currently exists in South Africa.

1.2.2 South African service delivery in an economic context

Schwella (2001) reiterated that one feature of the South African economy that affects the potential for service delivery is inadequate growth. With a growth rate of 6% set as a benchmark in 1994, it is difficult to fulfil service delivery needs in 2015.The South African economy was forecast to grow by 2% in 2015, with a gradual improvement to 3% by 2017 (National Treasury, 2015). National Treasury (2015) expected a budget deficit of 3.9% for GDP in 2014/15, narrowing to 2.5% in 2017/18. This deficit can detrimentally affect service delivery to its citizens as the government will be mandated to service its debt. R634 billion was allocated to programmes on local development and social infrastructure, including R145.5 billion on municipal infrastructure (National Treasury, 2015). Some of these resources needed to be redirected towards ICT initiatives as part of local development in order to promote the uptake and usage of ICT by citizens in accessing municipal services.

Another important factor to consider, in economic as well as social terms, is South Africa's highly skewed wealth distribution (Schwella, 2001). Schwella (2001) further explained that

the Gini coefficient, which measures income distribution in an economy, is approximately 6 for South Africa, compared with 3.7 for industrialized countries. By this measure, South Africa can be regarded as a poor country, where half of the population lives below the household subsistence level (Schwella, 2001). It is against this background that citizens will thrive by getting improved service delivery through the implementation of e-governance, but are handicapped with their current circumstances. Government intervention is therefore required to address inequalities, which exists within societies.

1.2.3 Legislative and policy context

Since the transition to democracy in South Africa in 1994, every aspect of social service provision has come under critical scrutiny. This has lead to policy revision through the process of consultation and stakeholder participation (Mubangizi & Gray, 2011). Hence a White Paper on Transforming Public Service Delivery was drafted. Krugell, Otto and Merwe (2010) explained that in 1994 the South African Government adopted the Reconstruction and Development Programme (RDP) as its socio-economic policy framework and spelt out key pillars of delivery, including meeting basic needs and developing human resources. Krugell, et al. (2010) indicated that South Africa policy and regulatory efforts include the Batho Pele themes of Freedom of Information (FOI) policy, ICT policy, Universal Access

Table 1-1: Themes of Batho Pele.

Theme	The corresponding policies and acts
Overarching/transversal legislative frameworks	• The Constitution of the Republic of South Africa of 1996 (as amended) (South Africa, 1996)
	• The White Paper on the Transformation of the Public Service of 1995 (WPTPS)
	• Public Service Regulations of 1999 and 2001
Access to information	• Open Democracy Act of 2000
	• Promotion of Access to Information Act of 2000
	• Electronic Communications and Transactions Bill of 2002
	• E-government strategy of 2001
Transforming public service delivery	• White Paper on Transforming Public Service Delivery of 1997
	• Promotion of Administration Justice Act (AJA) of 2000
	• Public Finance Management Act of 1999

Source: Twinomurinzi, Phahlamohlaka and Byrene (2012).

policy, Vision 2014 development strategy, Universal Service and Access policy, and E-governance Vision as listed in Table 1-1. It is against this background that the public service delivery policies were designed and promulgated to deal with the simultaneous transformation and quest for improved, service delivery-oriented public service in South Africa through e-governance.

1.2.4 Challenges of e-governance in South Africa

Akula, Narasimha, and Chandrashekar (2014) expressed that local authorities in South Africa are not fully implementing and integrating e-governance tools of ICT as a new way forward for public management in improving service delivery. Akula, et al. (2014) further explained that South African government has made heavy investment in both physical resources and modern ICT infrastructure, but the public is still not convinced that they have benefited to the extent envisioned by the government. For example Gauteng Department of Education launched online school registration on the 11April 2016 to enable planning and fair distribution of pupils. However, the system crashed soon after its launch due to overload as the system could not handle more than 6000 hits per second (Times live, 2016).

Thakur and Singh (2012) explained that eThekwini municipality launched the eThekwini Revenue Management System at an estimated cost of R250m and the costs have escalated to R474m. The city manager has stated that the municipality will enlist the services of an independent risk assurer, at a cost, to test the system as they cannot give a guarantee that the new billing system would work (Thakur & Singh, 2012). Thakur and Singh (2012) gave another example that Johannesburg City Council is experiencing similar challenges with its ICT services, causing both business and citizens to engage in legal action over poor services, such as inconsistent bills and disrupted services. Heeks (2002) highlighted that a set of touch-screen kiosks were installed for remote rural communities in South Africa's North-West Province. However, the kiosks' lack of current or local content and lack of interactivity led to disuse, and the kiosks were removed less than one year later (Heeks,2002).

In 2007, the electronic National Traffic Information System (eNaTIS) was implemented (Rajapakse, Van-Der-Vyver & Hommes, 2012). Rajapakse, et al. (2012) indicated that one month after its implementation, it was reported that the Auditor General warned the Department of Transport that the eNaTIS system was flawed and that there was an 80 percent chance of eNaTIS failing. Rajapakse, et al. (2012) reported thatthe department, however, went ahead and installed the R408 million systems which caused the country's

vehicle licensing process to stop. Rajapakse, et al. (2012) explained thatin that same year, a High Court found that eNaTIS posed a security risk in terms of the confidentiality of citizens' data. Rajapakse, et al. (2012) highlighted that passwords were not administered adequately and 'security patches' were not installed appropriately. Although the eNaTIS system has now been operational for five years, it still does not offer complete client satisfaction (Rajapakse, et al., 2012). It is against this background that this research seeks to develop a secure e-governance framework that promotes improved service delivery for local authorities in South Africa.

1.2.5 Characteristics of municipalities involved in the study

This section introduces six municipalities involved in this research. These municipalities are City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality,

Table1-2: Municipalities in Gauteng Province.

			Selected for the Study	
			Yes	**No**
Metropolitans		City of Ekurhuleni	√	
		City of Johannesburg	√	
		City of Tshwane	√	
District Municipalities	Sedibeng District	Emfuleni Local		x
		Lesedi Local	√	
		Midvaal Local		x
	West Rand District	Merafong City Local		x
		Mogale City Local		x
		Randfontein Local	√	
		Westonaria Local	√	

Randfontein local municipality and Westonaria local municipality. Gauteng is divided into three Metropolitan Municipalities, City of Ekurhuleni, City of Johannesburg and City of Tshwane as well as two district municipalities namely Sedibeng and West Rand, which are further subdivided into seven local municipalities. Table 1-2 shows municipalities in Gauteng Province which were selected for the study and those which were excluded from the study.

1.2.6 Rationale for selecting municipalities involved in the study

The selected municipalities for this study are from Gauteng Province. The reason for selecting municipalities from this province is because Gauteng Province is considered the economic hub of South Africa and is often the first choice of destination by job seekers across the country (Statistics South Africa, 2011). While the smallest province, Gauteng is the province with the most populous, with 12 272 263 people (Local Government, 2016). It is a province with a unique, African character, world-class infrastructure in the fields of telecommunications, transportation, water and power, and with globally-competitive health care and educational facilities (Statistics South Africa, 2011). However, the province is also one of contrasts—home to both wealthy and poor, residents and refugees, global corporations and emerging enterprises (Local Government, 2016). The results obtained from this study can be generalised and replicated in other municipalities with similar status in South Africa.

1.3 Problem Statement

There is slow uptake of e-governance initiatives by citizens despite the proliferation of ICT tools. Kroukamp (2005) identified some of the causal factors, such as strict regulation, security of information, digital divide, education, resistance to change, among others that can be attributed to the slow uptake and implementation of ICT in public service offerings. Municipalities are failing to adequately provide online services to their citizens due to factors such as system failures (Akula, et al., 2014). The municipalities have constantly been accused of non-transparency and red-tape procedures in disclosing information and delivery of services to its citizens (Bawa, 2012).Aikins and Krane (2010) claimed that municipal officials have not fully taken advantage of the interactive features of the Internet to connect citizens to their governments. Aikins and Krane (2010) indicated that studies show that although the internet has great potential to improve government–citizen relations, many governments at all levels have not taken advantage of this potential to improve website deliberative features to enhance online citizen participation in the policy process.

Although researchers the world over are actively researching on e-governance, it is clear that there are currently no globally-agreed upon e-governance designs that can be implemented in heterogeneous country contexts (Luna-Reyes & Gil-Garcia, 2011). The lack of global design frameworks and models therefore calls for e-governance designs to be informed by local contexts for complex and unique contextual characteristics such as legal, institutional and regulatory frameworks, political setups, cultural, beliefs, etc., to be intertwined into the (Bwalya & Mulula, 2015). This study add knowledge regarding challenges faced by local authorities in South Africa in service delivery and how e-governance through the use of ICT tools can be maximized by developing a framework applicable to local government in improving service delivery in South African context.

Jain (2010) expressed that South African government has invested heavily in the establishment of effective e-governance strategies for the past few years to enhance service delivery. Jain (2010) interpreted statistics, which showed the locations of service delivery protest and the concerns of protestors from 2007–2016 in South Africa and generalised that protests were taking place in all the nine provinces and protestors were mostly complaining about housing followed by electricity, water, general poor service delivery itself, sanitation, corruption, living conditions, infrastructure to mention just a few which was also triggered by the just ended 2016 local government elections. These service delivery protests however have increased in the recent past in the period 2011–2017. This is however a clear indication that there is a challenge in service delivery which could be addressed by applying e-governance tools to improve service delivery.

Titah and Bark (2006) explained that e-governance is an emerging field or practice and it is still in its nascent stage of development and therefore does not have a well-established theoretical underpinnings (Titah & Bark, 2006). In this regard, Titah and Bark (2006) assert that despite increased research interest in e-governance, the field currently lacks sound theoretical frameworks on e-governance and service delivery and researchers are mainly concerned with the e-government evolution life cycle such as Howard (2001) three stage model, West (2004) four stage model of e-government development, United Nations (2001) five stage with little on e-governance and a frameworks for improving service delivery in an African context, therefore the need to carry out this research in a bid to develop e-governance framework that improves service delivery to citizens at local government level in South African context.

1.4 Research Questions

The following research questions were used to address the research problem and to fulfil the purpose or aim of the research:

- Why is there a low uptake and usage of ICT by citizens at a local government level in South Africa?
- Why are local authorities offering poor service delivery to their citizens in South Africa?
- How can e-governance and e-government tools be applied in developing a framework for improving service delivery for local authorities in South Africa?

1.5 Research Objectives

The objectives of this research are:

- Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.
- Assess and explain the services offered to citizens by local authorities in South Africa.
- Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful and to develop e-governance framework for improving service delivery for local authorities in South African context.

Table 1-3 summarises the linkages of research questions (1.4), research objectives (1.5), possible sources of data and theories used.

Table1-3: Research questions, research objectives, possible source of information and theories used.

No	Research questions	Research objectives	Possible sources Data/information	Theory/Model
1	Why is there a low uptake and usage of ICT by citizens at a local government level in South Africa?	Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.	• Literature review	• Nath (2005)Interactive-Service Model
			• Questionnaires	• Davis (1989) Technology Acceptance Model (TAM)
			• Interviews	• Nath (2005) Broadcasting/Wider Dissemination Model
				• Siau and Long (2005)Synthesized Stage Model
2	Why are local authorities offering poor service delivery to their citizens in South Africa?	Assess and explain the services offered to citizens by local authorities in South Africa	• Interviews	• Nath (2005) Critical flow model
			• Questionnaires	• DeLone and McLean (1992) Information System Success model
			• Literature review	• Rogers (1995)DOI Model
				• Nath (2005) Comparative Analysis Model
				• Nath (2005) Mobilisation and lobby Model
3	How can e-governance and e-government tools be applied in developing a framework for improving service delivery for local authorities in South Africa?	Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa.	Synthesized	All of the above models and
				• Wilson (1996) information behaviour model

1.6 Importance and benefits of the study

This research addresses the gap in the knowledge of the low uptake and usage of ICT by citizens at local government level in South Africa. This study provides a theoretical and practical insight on factors why local authorities offer poor service delivery to their citizens in

South Africa. This study assesses the relevance and validity of e-governance and e-government theories and practice in service delivery in South Africa. Titah and Bark (2006) highlighted that e-governance is an emerging field or practice and it is still in its nascent stage of development and therefore does not have a well-established theoretical underpinnings. In this regard, Titah and Bark (2006) asserted that despite increased research interest in e-governance, the field currently lacks sound theoretical frameworks on e-governance and service delivery. Researchers are mainly concerned with the e-government evolution life cycle, such as Howard (2001) three stage model, West (2004) four stage model of e-government development, United Nation (2001) five stage with little on e-governance framework that improves service delivery in African context. Therefore the need to carry out this research.

Ifinedo (2006) supported that e-governance and e-government literature tends to focus its attention mainly on issues relating to the implementation, adoption, and effectiveness of e-governance services from the perspective of the developed West with little or no attention being paid to sub-Saharan Africa e-governance initiatives (Ifinedo, 2006). This research aims to unlock and bridge the knowledge gap which exists between the information which exists in the developed West concerning e-governance literature to make it available in developing countries and to develop e-governance framework for improving service delivery for local authorities in South Africa. Ifinedo (2006) further argued that the existing research on e-governance in improving service delivery has not yet explored nor produced an account of complex dynamics governing the early phases of e-governance tools and infrastructure development in developing countries. This research aims to unpack these complex dynamics by applying ICT tools in improving service delivery in an African context. This study is important to scholars researching on e-governance by providing theoretical and practical insight on issues of e-governance in local authorities in South Africa.

1.7 Delimitation and assumptions

1.7.1 Delimitations (Scope)

This study is in management and governance academic area and is focused on e-governance and ICT tools and how ICT can be used to develop the e-governance framework for improving service delivery at local government level in the South African context. The study focused on internal processes of local authorities and services offered to citizens.

Table1-4: Definitions of key terms used in this document

Key term	Definition applied
Cloud storage	A virtual space to store mass information (Prabu & Ganapathy, 2017).
Corporate governance ICT framework	Leadership and organizational structures and processes that ensure an organization's IT sustains and extends the organization's strategy and objectives (ITGI, 2016).
digital divide	Inequities in access to the transformative potential of communications technology, as well as the fact that the population that has no access to the World Wide Web is "sizeable" (Flanagan, 2016).
Ecosystem	Composed of four layers -content, hardware, software, and telecommunications (Lee, Park, & Lee, 2018.
e-governance	The public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective (Jain & Sharma, 2007).
e-government	The use of and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people (United Nations, 2014).
Smart cities	The implementation and deployment of information and communication technology (ICT) infrastructures to support social and urban growth through improving the economy, citizens' involvement and government efficiency (Yeh, 2017).
Two-factor authentication	Implemented for online purchases that utilize a credit card and could help reduce if not almost eliminate fraudulent purchases made with credit cards (Gualdoni, Kurtz, Myzyri, & Rizvi, 2017).

1.8 Assumptions

The assumption for this study is that local authorities in South Africa have adopted and implemented some form of e-governance as a way of improving delivering service to the citizens as is witnessed by the presence of websites for the municipalities under the study. There is also an assumption that there is a positive relationship between the application of ICT tools and improved e-governance in local authorities.

1.9 Definition of key terms

Table 1-4 provides a summary of the definitions of the most important key terms used in this study.

1.10 Organisation of the thesis

Chapter 1 paves the way for this study by giving an introduction for this research. This is followed by the section giving the background to the study, the problem statement and the research objectives. Importance of the study and delimitations of the study are discussed. The chapter ended by explaining definitions of key terms used in the research. Chapter 2 provides literature review around e-governance and e-government. An overview of e-governance at global level, continental, regional, national and provincial level was discussed. Mobile penetration and digital divide was also discussed in this chapter. Chapter 3 explains the theoretical underpinnings and theoretical framework for the study. Chapter 4 discusses the methodologies used in the study, research design, motivation for mixed methodology, data collection tools, quantitative data analysis, qualitative data analysis, content analysis, validity and reliability and the ethical issues. Chapter 5 sheds light on the analysis of the study's survey, presents and discusses the findings. Chapter 6 demonstrates and discusses the results from interviews. Chapter 7 shows e-governance framework for improving service delivery in local authorities in South African context. Lastly, Chapter 8 gives a summary of the research findings, limitations, conclusions and recommendations for further studies.

1.11 Chapter conclusion

This chapter started by introducing how local authorities at governmental level have the most direct contact with the citizens and the businesses and is responsible for providing an array of basic services (Flak, et al., 2005). The chapter presented general background of the study by highlighting South African social realities, legislative and policy context, the challenges of e-governance initiatives in South Africa. Profile of municipalities involved in the study and

rationale for selecting these municipalities was also discussed. The chapter introduced the problem statement, research questions and research objectives of the study. Importance and benefits of the study as well as delimitations and assumptions of the study was highlighted. Definition of key terms was explained. The chapter ended by giving an overview of how the whole thesis is organised. The next chapter will discuss the literature review for this study.

CHAPTER 2: OVERVIEW AND DEBATE ON E-GOVERNANCE AND E-GOVERNMENT

2.1 Introduction

This section provides a review of the literature on the e-governance issues. The literature review was presented as follows:

- Debates on e-governance and e-government, as well as the conceptualisation of e-governance;
- Use of e-governance in municipalities and e-government at global level, continental level, regional level and country level.
- The literature review is discussed in relation to objectives of the study as defined in section 1.5.
    a) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.
    b) Assess and explain the services offered to citizens by local authorities in South Africa.
    c) Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful and to develop e-governance framework for improving service delivery for local authorities in South African context.

2.2 Debate on e-governance and e-government

Jain and Sharma (2007) contend that “e-governance is the public sector’s use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. Jain and Sharma (2007) further explained that e-governance involves new styles of leadership, new ways of debating and deciding policy and investment, new ways of accessing education, new ways of listening to citizens and new ways of organizing and delivering information and services. E-governance is generally considered as a wider concept than e-government, since it can bring about a change in the way citizens relate to governments and to each other (Jain & Sharma, 2007). Jain and Sharma (2007) argued that e-governance can bring forth new concepts of citizenship, both in terms of citizen needs and responsibilities and that its objective is to engage, enable and empower the citizen”. Mukonza (2014) elaborated that the definition touches on a wide range of aspects of public sector governance with emphasis on how the use of ICTs

enhance good governance. Mukonza (2014) pointed out that the definition, however omits that e-governance has led to serious changes in the manner in which government produces goods and services.

As observed by Muhammad and Abu-Momtaz (2007), the introduction of ICTs in governance has led to the replacement of two known elements of production labour and capital by information and knowledge. It is further asserted that internet created the same break-through as the printing press did in the fifteenth century (Muhammad & Abu-Momtaz, 2007). It must be pointed out however that in their work, Understanding e-governance: A theoretical approach, Muhammad and Abu-Momtaz (2007) choose to use the terms e-governance and e-government interchangeably as if they mean one and the same thing. It is argued therefore in this research that the two are different and any meaningful conceptualisation of either term can only be done by drawing a clear distinction of the two.

On the other hand, e-government refers to the use of and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people (United Nations, 2014). E-government is defined as delivering services via the internet, telephone, community centres (self-service or facilitated by others), wireless devices or other communication systems (Pacificcouncil, 2012). Van der Vyver (2007) separated that a stand out difference between e-governance and e-government is that the former goes beyond the scope of the later and e-governance does not just refer to a web site and e-mail. Van der Vyver (2007) further argued that e-governance is in essence a change in the relationships between government institutions and the environment, which includes business and civil society.

Van der Vyver (2007) highlighted that e-government is a form of e-business in governance and refers to the process and structures needed to deliver electronic services to the public (citizens and businesses), collaborate with business partners and to conduct electronic transactions within an organisational entity. As Mukonza (2014) observed, e-government should be viewed as a subset of e-governance. Lal and Haleem (2002) explained that e-government provides an opportunity to enhance user satisfaction by providing 24hr/365 days access to government information and services, a rapidly evolving space where static information is being replaced by online transaction and integrated government solutions. Lal and Haleem (2002) distinguished that “e-governance is defined as the application of electronic means in (1) the interaction between government and citizens and the government

and business, as well as (2) in internal government operations to simplify and improve democratic, government and business aspects of governance".

Mukherjee and Roy (2016) urged that the terms e-government and e-governance are closely inter-related as both terms are used to describe government's utilization of ICT services afforded to the citizens. There is an argument among researchers on the correct use of the two terms, but Visser and Hossana (2008) considered e-governance to refer to the use of ICT to support the administration or management of government, while e-government is the use of ICT to provide services in maintaining of government operations correctly. Visser and Hossana (2008) concluded by saying the term e-government is used to focus on government or public services through the use of ICT. Mukherjee and Roy (2016) explained that e-governance is the solution to the "Good Governance" for the developing countries to minimize corruption, provides efficient and effective quality services to their citizens. Reilly (2002) explained that e-governance has been defined as that which, "seeks to realize processes and structures for harnessing the potentialities of lCTs at various levels of government and the public sector and beyond, for the purpose of enhancing good governance.

Misurace (2007) defended a working definition of e-governance for Africa, which has also been developed by Africa Training and Research Centre in Administration for Development (CAFRAD) within the framework of the e-Africa Initiative for Good Governance, namely that "the use of ICTs and especially the internet to adopt a new conception and attitude of governing and managing where participation and efficiency are required of all the partners linked in a network. E-governance is therefore a new way of co-ordinating, planning, formulating and implementing decisions and operations related to governance problems. Governments can utilise e-governance to re-invent themselves, get closer to the citizenry and forge closer alliances and partnerships with diverse communities of interest, practice, expertise, conviction and inter-dependence within the context of national and international development agendas"(Misurace, 2007).

E-government is nothing more than a new label for processes that have been part of governance for decades (Gil-Garcia, 2012).Roman (2015) indicated that the meaning of e-government will be governed by the research context dependent on the scholars' backgrounds, assumptions or the function being emphasized. In broad terms, e-government is commonly defined as the use ICTs in governance (Dawes, 2008; Fountain, 2001; Maureen-Brown, 2007). Some scholars make a clear delineation between e-government and e-governance (Calista & Melitski, 2007;D'agostino, Schwester, Carrizales & Melitski, 2011);

others discern between e-government and e-democracy; while on other occasions e-government is merely broken down into functions such as e-service, e-organization, e-democracy, and e-partnering (Carrizales, 2008). Roman (2015) emphasised that the difficulty in reaching a consensus over the definition of e-government reflects, among others, the deeper underlying struggle for affirmation and indemnification within the field of study.

Misurace (2007) indicated that following the Riley Reports, the Common Wealth Centre for e-governance notes that e-governance differs from e-government in the sense that e-government constitutes the ways public sector institutions use technology to apply public administration principles and conduct the business of e-government: it is government using new tools to enhance the delivery of existing services (Misurace, 2007). Misurace (2007) further argued that e-governance includes the vision, strategies, planning, leadership and resources needed to carry this out: it is the way that political and social power are organised and used. This definition of e-governance is shown in Figure 2-1.

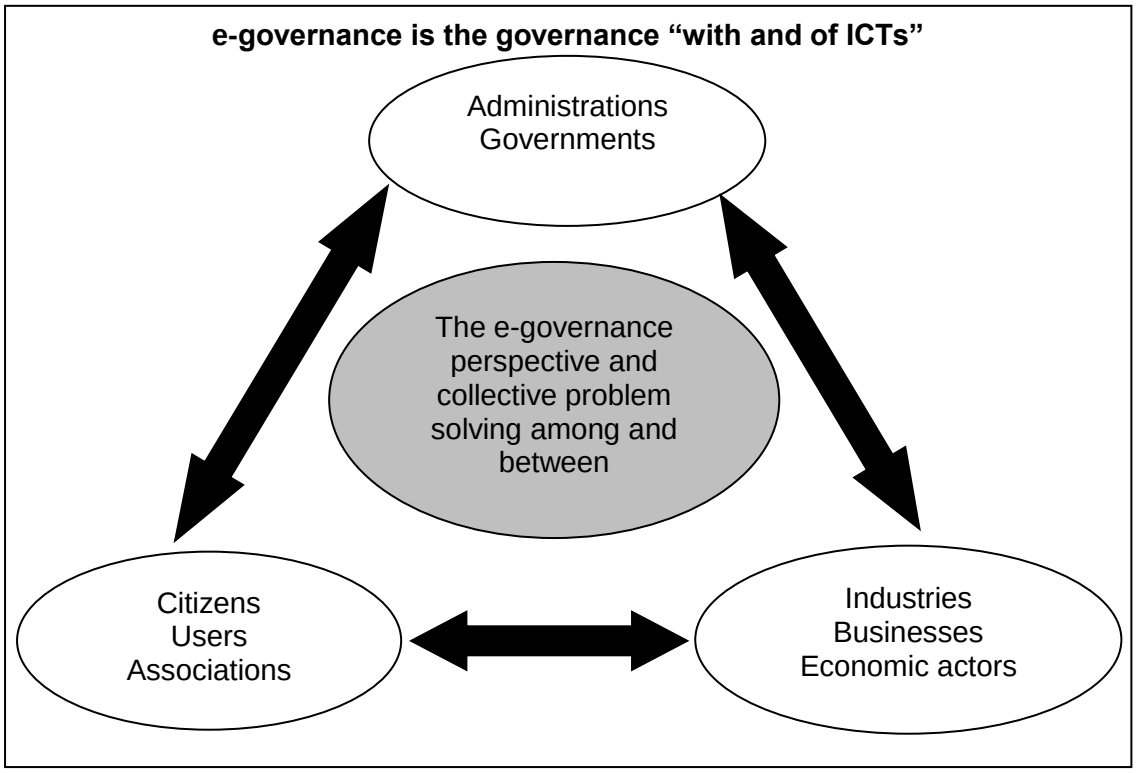

Figure 2-1: Definition of e-governance. Source: Misurace (2007).

This research has therefore adopted the definition of e-governance by Jain and Sharma (2007) who expressed that e-governance is the public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government

more accountable, transparent and effective. The study also used the definition of e-government by the United Nations (2014), which says that that e-government refers to the use of and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people. These definitions were used to develop framework for e-governance, which is suitable for improving service delivery in local authorities in South Africa. Figure 2-1 was used in this study in developing a proposed conceptual framework in Chapter 3.

Tavares, Soares and Estevez (2016) argued that within the latest stage in digital government evolution, context-specific public service delivery refers to specific efforts undertaken by national, regional and local governments in delivering public services to pursue specific public policy and sustainable development goals. Janowski (2015) explained that public service delivery denotes specializing digital government initiatives, including their objectives, design, operations and outcomes, to different local, sectorial and local-sectorial contexts to ensure that outcomes of public service delivery significantly contributes to public policy and development. Ntetha and Mostert (2011) defined service delivery as an activity or action that satisfies the needs of a person. In other words, it is the manner in which a customer's needs are met. This research however used the definition of service delivery by Janowski (2015) and Ntetha and Mostert (2015) to understand the aspects of service delivery and how it can be enhanced through the use of ICTs tools as part of e-governance.

2.3 Conceptualising e-governance

Misurace (2007) concepualised e-governance as a growing phenomenon around the world and is emerging as a significant discipline, initially within the field of public administration reform, but that is now being realised as not only being a "government business", but also eliciting societal challenges as well. Lal and Haleem (2002) highlighted that e-governance initiative normally starts at "computerization and "connectivity" and the initiative often gets stuck at a point leaving the hardware grossly underutilized. Lal and Haleem (2002) further argued that computers and connectivity are only the means to achieve e-governance and e-governance objectives and need to be supplemented with "content" and "training" so that the system is able to harness the benefits of e-governance. Misurace (2007) explained that the concept of e-governance is not commonly recognised and shared worldwide. For many, e-governance is just one more buzzword for e-government. For others, who aim at specific identifications, e-governance is merely an indication of the impact of e-governance outside

the administration boundaries, in particular when private economy actors are active stakeholders (Misurace, 2007).Three conceptualisations of e-governance have been identified:

- E-governance as customer satisfaction,
- E-governance as processes and interactions, and
- E-governance as a tool,

Misurace (2007) selected that the first and probably most widespread conceptualisation refers to customer satisfaction. Misurace (2007) evaluated that the term e-governance is not only used as being synonymous of e-government, it is moreover synonymous with satisfying the citizens/customers by means of delivering the services through the internet. Misurace (2007) appraised that generally this is the view of promoters of new public management who see in the ICTs a significant contribution to, and the next step in improving service delivery and especially customer satisfaction (Misurace, 2007). Misurace (2007) highlighted that for this conceptualisation, the main unit of analysis is the government or rather the administration, whose interface with the citizens the ICT are said to be going to improve. Misurace (2007) formulated that citizens are seen here as more or less passive recipients of digitalised information and services that is as customers. In other words at the heart of this conceptualisation it is not the process to which the ICTs are being applied, but merely the delivery of information and sometimes services (Misurace, 2007). This conceptualisation is important in this study as it is a building block for the development of e-governance framework for improving service delivery at local authority level in South Africa.

Misurace (2007) explained that in the second conceptualisation e-government is seen as a decisional process. Misurace (2007) expressed that International Centre of e-governance says for example, “Governance is not government, nor is it the act of governing. It is more usefully seen as a process: the process by which institutions, organisations, companies and societies guide themselves. It is also about how these bodies interact with each other, with their clients and with the public. At its most basic level, it is about how society organises itself for collective decision making, and also provides transparent mechanisms for seeing those decisions through. E-governance is shorthand term for the use and impact of technology, in particular ICTs, in governance systems”. Misurace (2007) argued that considering the combination of ICTs with governance, e-government is more and more moving towards e-governance where the concept of e-governance further encompasses e-government. This conceptualisation is therefore important for this study. For e-governance

framework to be successful it is of paramount important to first of all consider the internal processes of local authorities in order to come up with e-governance framework that will satisfy and meet the needs of the citizens.

Misurace (2007) created the third conceptualisation which sees e-governance as a set of tools in the hands of governance, or rather in the hands of the Administration. In other words, the starting point here is not the state or its transformation but the possibilities that ICTs offer (Misurace, 2007). Common Wealth Centre for e-governance (CGeG) argued that it is the moment of governments online to deliver their services and programmes to provide government information, and to interact with the citizens, all electronically. Misurace (2007) highlighted that this is resulting in the formation of new relationships between the citizens and the state. These tools are important in this research as it forms the basis for the construction of variable/constructs for this study to determine their relationships in the designing of e-governance framework for local authorities in South Africa.

2.3.1 Major pillars of e-governance

Lal and Haleem (2002) explained that e-governance has two dimensions. Lal and Haleem (2002) indicated that the first is application of Information Technology for the improvement of administration and second is application of governance to the emerging cyber society. Lal and Haleem (2002) argued that the system of governance consists of the ministry/departments and the parliamentary/state legislative systems, down to the elected representatives of the village/ward. Lal and Haleem (2002) expressedtheir understanding that it also includes the implementation consisting of officials and any other organisations involved in the delivery of collective state administered services to the citizens. Lal and Haleem (2002) stated that the system of e-governance is supported by five pillars:

- Computers—refers to all the hardware and software requirements of governance.
- Connectivity—refers to all carrier systems, bandwidth, etc.
- Content—refers to the information that is exchanged between the "consumers" of the system.
- Confidence building—refers to those measures that help the citizens develop confidence in the e-governance and encourages them to take to a-transformation.

Figure 2-2 illustrates the important pillars of e-governance, which has been also been used in designing conceptual framework in Chapter 3.

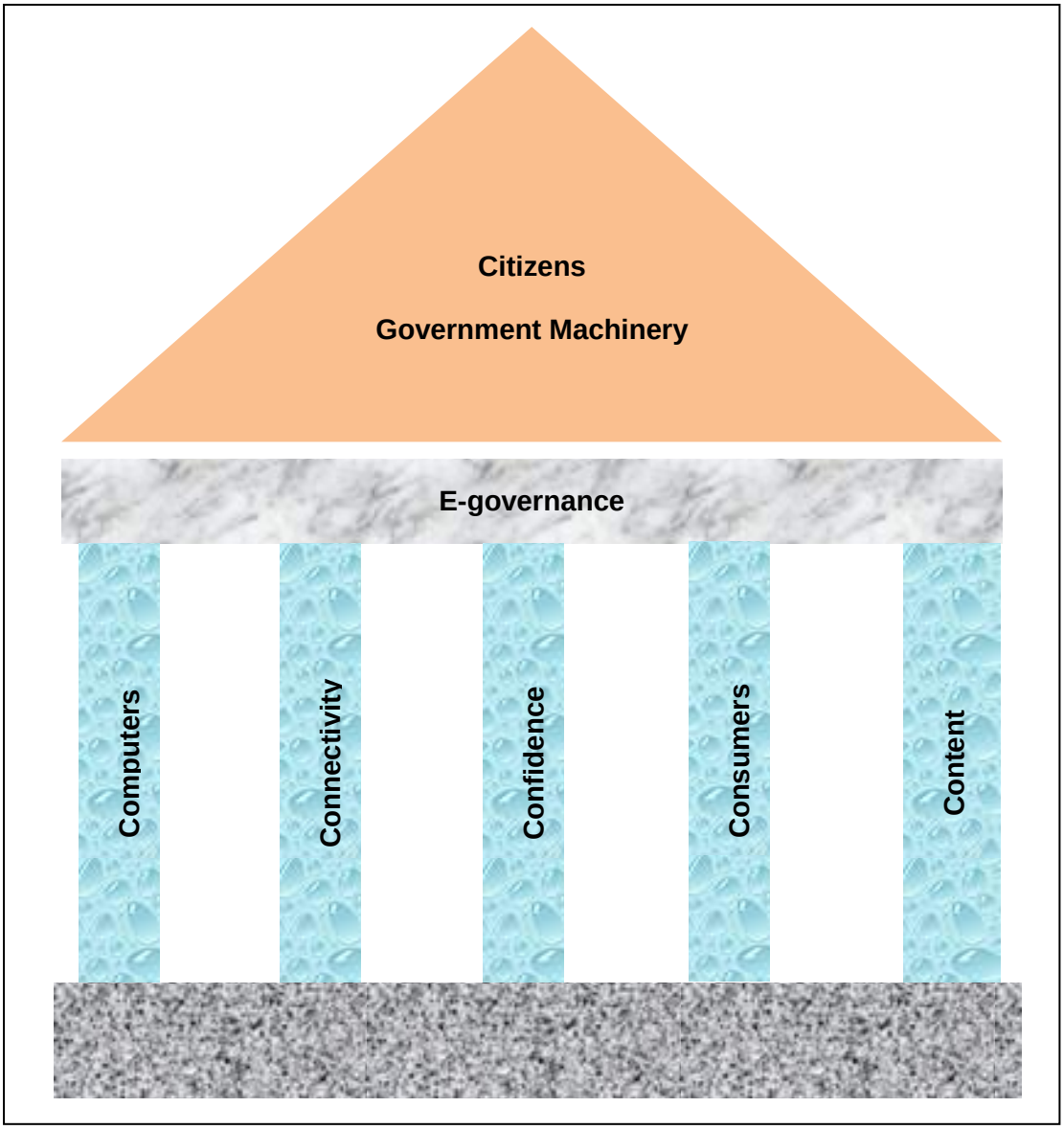

Figure 2-2: Pillars of e-governance. Source: Lal and Haleem (2002).

2.4 Overview of global e-governance in municipalities

Holzer, Zheng, Manoharan and Shark (2014) explained that Rutgers carried out a global e-governance survey from 100 large municipalities worldwide in 2013–2014. The survey evaluated the websites of municipalities in terms of digital governance and ranked them on a global scale. Simply stated, digital governance is comprised of both digital government (delivery of public services) and digital democracy (citizen participation in governance). The instrument used by the survey for evaluating city and municipal websites consisted of five components:

- Privacy and Security;
- Usability;
- Content;
- Services; and
- Citizen and Social Engagement

The research focused on global cities based on their population size and the total number of individuals using the Internet in each nation (Holzer, et al., 2014). Holzer, et al. (2014) explained that the top 100 most wired nations were identified using data from the organization affiliated with the United Nations. Holzer, et al. (2014) highlighted that the largest city by population in each of these 100 International Telecommunication Union (ITU), nations was then selected for the study and used as a surrogate for all cities in each respective country. Holzer, et al. (2014) expressed that inorder to examine how local populations perceive their governments online, the study evaluated the official websites of each of these largest cities in their native languages. Holzer, et al. (2014) established that of the 100 cities selected, all were found to have official municipal websites, and these were evaluated between August and December of 2013. For the 2005 survey, 81 of the 100 cities had official websites, which increased to 86 for the 2007 survey, 87 for the 2009 survey, 92 for the 2011–12 survey, and 100 for the 2013–14 survey (Holzer, et al., 2014). This represents a significant increase in the adoption of e-governance among municipalities across the world (Holzer, et al., 2014). Based on the 2013–14 evaluation of 100 cities, Seoul, New York, Hong Kong, Singapore, and Yerevan have the highest evaluation scores (Holzer, et al., 2014).

Holzer, et al. (2014) contrasted that there were noticeable changes in the top five cities when compared to the 2011–12 study and Seoul remained the highest-ranked city, and the gap between first and second cities had increased. Table 2-1 lists the top 20 municipalities in digital governance from 2009 through 2013–14.Only one African municipal country managed to be in top 20 in 2009 which is the City of Johannesburg. It is therefore a clear indication that as African countries, the continent is still lagging behind in terms of e-governance implementation.

Table 2-1: Top in cities in digital governance 2009-2013/14

	2009		2011–2012		2013–2014	
Rank	**City**	**Score**	**City**	**Score**	**City**	**Score**
1	Seoul	84.74	Seoul	82.23	Seoul	85.80
2	Prague	72.84	Toronto	64.31	New York	66.15
3	Hong Kong	62.83	Madrid	63.63	Hong Kong	60.32
4	New York	61.10	Prague	61.72	Singapore	59.82
5	Singapore	58.81	Hong Kong	60.81	Yerevan	59.61
6	Shanghai	57.41	New York	60.49	Bratislava	58.31
7	Madrid	55.59	Stockholm	60.26	Toronto	58.05
8	Vienna	55.48	Bratislava	56.74	Shanghai	56.02
9	Auckland	55.28	London	56.19	Dubai	55.89
10	Toronto	52.87	Shanghai	55.49	Prague	54.88
11	Paris	52.65	Vilnius	55.35	Vilnius	53.83
12	Bratislava	52.51	Vienna	54.79	Oslo	53.40
13	London	51.96	Helsinki	54.22	Stockholm	52.52
14	Jerusalem	50.64	Auckland	53.19	London	52.25
15	Tokyo	50.59	Dubai	53.18	Helsinki	51.90
16	Zagreb	50.16	Singapore	52.21	Vienna	51.27
17	Ljubljana	49.39	Moscow	51.77	Macao	48.69
18	Lisbon	48.82	Copenhagen	50.06	Mexico City	47.01
19	Brussels	48.01	Yerevan	49.97	Kuala Lumpur	46.16
20	Johannesburg	47.68	Paris	48.65	Zurich	45.36

Source: (Holzer, et al., 2014).

Tables 2-2 show the top-ranking municipalities in service delivery category. This is the area which this research is most interested in as it seeks to develop e-governance framework which improves service delivery for local authorities in South Africa. Once again there is no African municipality which managed to be in top 10. It is one of the objectives of this study to draw some lessons from developed countries in order to develop e-governance framework in an African context.

Table 2-2: Top cities in service delivery 2013-2014

Rank	City	Country	Services
1	Seoul	Korea (Rep.)	16.72
2	Shanghai	China	15.41
3	New York	United States	15.25
4	Dubai	United Arab Emirates	13.77
5	Stockholm	Sweden	13.11
6	Hong Kong	Hong Kong, China	12.79
7	Singapore	Singapore	12.30
8	Yerevan	Armenia	12.13
8	Kuala Lumpur	Malaysia	12.13
9	Toronto	Canada	11.15

Source: (Holzer, et al., 2014).

2.4.1 Best practice and benchmark in e-governance

The ultimate goal of this research is to establish how e-governance through the use of ICTs can improve service delivery. Table 2-2 shows that Seoul City is the leader in implementing e-governance and subsequently offered improved service delivery to their citizens. Toronto is also doing well sitting on number 9 in terms of improving service delivery to citizens. The best practice of e-governance from these developed countries is going to be incorporated in this study in designing e-governance framework for local authorities in South Africa.

SEOUL

Korea is one of a few jurisdictions which set up the Internet domestically in the early days of Internet development and has since continued to be a breeding ground for global Internet trends (Yang, 2017).Since launching its first Internet connection in 1982, Korea has been at the forefront of a number of Internet trends, such as Internet user cultures, social networking services, and online gaming enabled by the escalating prevalence of broadband Internet and high number of users (Chon, Park& Hur, 2013).

Holzer, et al. (2014) indicated that Seoul is ranked number 1 again in the Sixth Worldwide Digital Governance Survey. Seoul's official website scored high in all five categories, including number 1 in Privacy/Security, Content, Services, and Citizen and Social Engagement. Holzer, et al. (2014) further explained that Seoul is ranked number 3 in

Usability and that Seoul's website design is user-oriented and quite easy to use. Holzer, et al. (2014) expressed that the relatively short homepage, consistent navigation and formatting, excellent sitemap, and so on, make the website very user-friendly.

Yang (2017) argued that seeing the Internet as the future of the nation supported the governmental decision to invest, which enabled the speedy construction of a technological infrastructure that in return became tangible evidence for the claim that Korea had become an Internet powerhouse.

NEW YORK

According to the International Telecommunication Union's (Telecommunication/ICT Indicators Database, the world top broadband economies are from Europe, Asia, and the Pacific (International-Telecommunications-Union, 2013). Additionally, the United States ranks 16th in broadband Internet connections, 17th in fixed broadband Internet subscriptions, and 35th in Internet bandwidth out of 148 nations worldwide. The United States ranks 50th out of 90 nations in cost of broadband Internet access (International Telecommunications Union, 2013).

Europe is the world's leading region in ICT infrastructure and services and this comes as no surprise, as the, Old Continent' has a population that is much more homogenous and its constant commitment to ICT values is easily understood (Dobrota, Jeremic& Markovic, 2018) United States is one of them. Holzer, et al. (2014) indicated that New York's ranking rose to number 2 in the Sixth Global e-governance Survey, compared to its ranking as number 6 in 2011–12.Holzer, et al. (2014) justified that New York has continually ranked very high in the past global surveys, reflecting its excellent performance in digital governance. Holzer, et al. (2014) explained that in specific categories, New York ranked number 7 in Privacy/Security, number 5 in Content, number 3 in Services, and number 7 in Citizen and Social Engagement.

Buente (2016) in his study concluded that digital citizenship, understood as frequent home Internet use, made a positive impact on electoral engagement in the 2008 United States presidential election (Buente, 2016). This was therefore used as part of social engagement by the United States government

Holzer, et al. (2014) indicated that as for citizen engagement, citizens can directly file a complaint through the website for such matters as noise, transportation and public safety. Holzer, et al. (2014) justify that New Yorkers are able to use social media, such as

Facebook, Twitter, Foursquare, Instagram, Tumblr, to connect and interact with government officials through the website as many departments have their own social media accounts. The website serves as a best practice for enabling the public to better engage with government (Holzer, et al., 2014).

HONG KONG

China has witnessed rapid informationization along with its booming economic growth over the past decade and in 2016, the number of internet users has reached 731 million, making the internet penetration rate 53.2%, and the number of mobile phone users is 695 million (Liu, et al., 2017).

Holzer, et al. (2014) illustrated that Hong Kong is ranked number 3 in the Sixth Worldwide Digital Survey, compared to its ranking of number 5 in the 2011–12 survey. Holzer, et al. (2014) argued that it has continually been ranked top 5 in the past four surveys. Holzer, et al. (2014) separated that in specific categories, it ranked number 6 in Services, number 14 in Content, number 8 in Privacy and Security, and number 10 in Citizen and Social engagement.

Lee and Lio (2016) argued that Chinese government has been promoting ICT projects and enjoying the benefits to the public and private sectors provided by the Internet. On the other hand, the Chinese government has also invested countless resources in developing various types of Internet monitoring and filtering software and has employed an Internet police to monitor the activities of Internet users (Lee & Lio, 2016)

The website design of Hong Kong is similar to New York's in that all the information and services are well-organized based on what citizens want to know and want to do through this website (Holzer, et al., 2014). Under different topics, such as environment, education, health care and social services, visitors can locate the information they need efficiently. Holzer, et al. (2014) emphasised that Hong Kong does an excellent job of sharing database with the public through its "Data.One" portal. Holzer, et al. (2014) explained that citizens have access to a range of public data, including geospatial, population, public transportation, water quality, weather, etc and these data enable citizens to both better oversee government and make better choices in their everyday lives. As to public transportation, citizens can access to the live video or traffic condition snapshots through the website (Holzer, et al., 2014).

TORONTO

Toronto is also a leading municipality in e-governance. Although its ranking dropped slightly in 2014, Toronto serves as an exemplar in many areas (Holzer, et al., 2014). Holzer, et al. (2014) expressed that the Content and the homepage of Toronto is designed very well, with content divided into four parts: “Living in Toronto”, “Doing Business”, “Visiting Toronto”, and “Accessing City Hall.” Holzer, et al. (2014) went further to explain that visitors can easily find information and services based on their goals and status, for example, residents can go directly to the major four categories to find information on health, environment, culture and recreation. Holzer, et al. (2014) highlighted that users can choose to subscribe to different government events based on their needs and these events are also available through an audio version which can be directly downloaded. The city has Facebook, Twitter, and YouTube accounts so that the public might follow updates through social media (Holzer, et al., 2014).

Holzer, et al. (2014) reiterated that Toronto also serves as an exemplar for opening government performance data to the public. Holzer, et al. (2014) highlighted that data of many kinds, such as community services, culture and tourism, finance, garbage and recycling can be searched and downloaded, which enables citizens to better understand government. Holzer, et al. (2014) gave examples where citizens have access to the dataset of voter statistics for elections and the dataset of service requests from customers in the past month. Holzer, et al. (2014) eluded that Toronto also publishes the “Performance Management and Benchmarking Report”, which provides residents with government performance data. The report has detailed information about performance measurements and indicators in 33 services areas, through which citizens may know whether improvements have been made in certain areas and thereby evaluate government performance (Holzer, et al., 2014).

SINGAPORE

Countries, such as Singapore, which base their development and progress on ICT, are more competitive than other countries (Zoroja, 2015). The Global Competitiveness Report confirmed their high ranking in 2014 on the competitiveness scale where Singapore was in second place) (World Economic Forum, 2014).

Yunis, Koong, Liu, Kwam and Tsang (2012) argued that ICT progress and usage is a key factor in personal, economic and social development in relation to communication, business

and learning. The best example of this is the state of Singapore and Singapore's strategic development plan is based on development and the use of ICT, aimed at the realisation of economic growth (Yunis, et al., 2012).

Singapore has enjoyed high ICT penetration since the government initiated a master plan of developing the city-state into an 'intelligent island' (Zhang, 2013). The computer ownership rate was 84% in 2010 (Infocomm Development Authority, 2010). Internet access had increased to 78% in 2010, as compared to a mere 6% in 1996. Mobile phone penetration in 2009 had reached 137%, meaning that many Singaporeans use more than one phone and these figures not only exceed the regional average, but also put Singapore among the most developed ICT countries in the world (Infocomm Development Authority, 2010).

Similar to Toronto, information and services in Singapore are also divided into different categories: Government, Citizens and Residents, Businesses, and Non-Residents (Holzer, et al., 2014).Holzer, et al. (2014) highlighted that information such as government news, calendar of events, and directory are clearly posted on the main page for public access. Holzer, et al. (2014) provided that online services under topics such as education, employment, housing, immigration and citizenship, are provided to citizens. Holzer, et al. (2014) added that applications for passports, paying income and property tax, and paying bills for school fees can be completed online as well. Holzer, et al. (2014:98) deduced that well-designed search tools on the website enable citizens to locate services they need fast and conveniently.

Holzer, et al. (2014) argued that one feature of Singapore's online services is the "OneInbox," which is an account enabling resident's access to their government statements, advisory notes, reminders, payment notices, and more from one convenient place. With this account, users can easily signup, view, file and track correspondence, receive reminders via email, and so on, a convenient means for citizens to obtain services online. Holzer, et al. (2014) gave another excellent example Singapore has provided is in engaging citizens. Holzer, et al. (2014) shared that it is widely known that citizen participation plays an important role in government decision-making processes, helping governments to be more responsible, transparent, effective and efficient. Holzer, et al. (2014) explained that the problem is how to use ICTs to better involve citizens in government's operations. Holzer, et al. (2014) indicated that in Singapore, online surveys and forms are provided for citizens to directly provide their feedback and comments. Holzer, et al. (2014) observed that Singapore also has a website, "eCitizen Ideas," on which government posts the challenges or public issues that the city is facing and prizes are provided to motivate citizens to offer their ideas,

citizens can post those ideas and interact with others. In the end, government will analyze feedback from the public and make the final decision and this is an effective way to involve citizens at the earliest stages of policy-making processes (Holzer, et al., 2014).

2.5 Overview of the 2016 United Nations e-government survey

In the United Nation Survey (United Nations, 2016), 29 countries score “very high”, with e-government development index (EGDI) values in the range of 0.75 to 1.00, as compared to only 10 countries in 2003. Since 2014, all 193 Member States of the UN have delivered some form of online presence (United Nations, 2016). E-government is now ubiquitous in many more countries, a stark contrast in comparison to 2003—when 18 countries or about 10% of countries globally were without any online presence. 51 per cent of countries had “low EGDI” or “medium EGDI” values in 2016, as compared to over 73 per cent of countries in 2003 (United-Nations, 2016).

Table 2.3 shows a list of countries leading in e-government development, with corresponding EGDI values and its three components, namely the Online Service Index (OSI), the Telecommunication Infrastructure Index (TII) and the Human Capital Index (HCI).4 For the first time, the top ranking goes to the United Kingdom, which was ranked fifth in the 2003 Survey and has been among the top 10 for the past seven editions of the Survey (United-Nations, 2016). These dimensions was therefore considered in addressing the research questions highlighted in Chapter one and in developing e-governance framework for improving service delivery in local authorities in South Africa. The United Kingdom has also been leading the global trend in deploying new web technologies such as HTML5, as part of the aim to make its national portal GOV.UK “accessible to the widest possible audience but this does not mean working to the lowest common denominator” (Berriman, 2012).

United Nations Survey (2016) indicated that Australia retains its second position, while the Republic of Korea falls from first position in the 2014 Survey to the third position. The Australian Government has been one of the early adopters of an extensive one-stop national portal, offering citizens a secured single sign-on for access to various interactive services, both at the federal and local levels, ranging from birth certifications to medicare, taxation, job search, aged care, child support, and among others (Government-of-Australia, 2015). Republic of Korea continues to innovate in e-government through its plan to move over 750 e-government services to the cloud by the end of 2016. By 2017, an estimate of more than 60 percent of e-government services will have been transferred to cloud computing (Iglauer, 2015).

Table 2-3: World leaders in e-government

Rank	Country	Index
1	United Kingdom	0.9193
2	Australia	0.9143
3	Republic of Korea	0.8915
4	Singapore	0.8828
5	Finland	0.8817
6	Sweden	0.8704
7	Netherland	0.8659
8	New Zealand	0.8653
9	Denmark	0.8510
10	France	0.8456

Source: United Nations e-government survey (2016).

Table 2-4: Lowest ranked 10 countries in e-government

Rank	Country	Index
184	Mauritania	0.1734
185	Burkina Faso	0.1598
186	Sierra Leone	0.1594
187	Djibouti	0.1337
188	Chad	0.1256
189	Guinea	0.1226
190	Eritrea	0.0902
191	Central Africa Republic	0.0789
192	Niger	0.0593
193	Somalia	0.0270

Source: United Nations e-government survey (United Nations, 2016).

Table 2-4 also shows the lowest ranked 10 countries in e-government, with Somalia ranked number 193 with an index of 0.0270 (United Nations, 2016). The United Nations e-government survey (United Nations, 2014) expressed that these e-government dimensions aims to enhance service delivery by simplifying bureaucratic procedures, enhancing efficiency and transparency, improving information sharing and innovation of service, and increasing the level of citizen empowerment. The research therefore reviews how the aims

for e-government aims in developed countries can be applied in developing countries such as South Africa and how it can assist this research to come up with e-governance framework that improves service delivery for local authorities in South Africa.

2.6 Comparative analysis of Rutgers e-governance 2013/14 survey and United Nations e-government 2016 survey

Table 2-5 shows the comparative analysis of the surveys carried out by Holzer, Zheng, Manoharan and Shark (2014) for Rutgers and the United Nations (2016) respectively. There are similarities and differences in the nature of their surveys since they have used different measurement and instruments in their evaluations. The surveys are both longitudinal in

Table 2-5: Rutgers e-governance survey and United Nations e-government comparative analysis

	Rutgers e-governance survey (2013/14)	**United Nations e-government survey (2016)**
Research focus	100 Municipalities (global cities)	All 193 United Nations member states
Nature of research	Longitudinal assessment	Longitudinal assessment
Research results presented	After every two years	After every two years
Research interest	E-governance of municipalities throughout the world	E-government readiness and e-government development status throughout the world
Measurement	Scores	E-government development Index (EGDI)
Instrument of evaluation	• Private and security	• Online services
	• Usability	• Telecommunication infrastructure
	• Content of website	• Human capacity
	• Types of online services offered	
	• Citizens and social engagements	
Survey results (highest scores)	• Seoul	• United Kingdom
	• New York	• Australia
	• Hong Kong	• Republic of Korea
	• Singapore	• Singapore
	• Yerevan	• Finland

nature and are produced after every two years. The results from the surveys show that the United Kingdom is ranked on top in the United Nation surveys, while Seoul is ranked first for Rutgers survey.

2.7 E-governance and e-government in African Municipalities

Ntetha and Mostert (2011) recognized that the African region was still far behind the world in almost all aspects of access to ICT for development and the regional e-government development.

The United Nations e-government survey (United Nations, 2016) indicated that top two performers on e-government with high EGDI values for Africa are Mauritius, ranked globally at 58th, Tunisia at 72nd and South Africa at 76th (United Nations, 2016). In the Americas, the United States and Canada are leading in e-government development and much emphasis has been placed on advancing e-government in the Asian region (United Nations, 2016). The United Nations e-government Survey (United Nations, 2016) showed that top two performers on e-government with high EGDI values for Asian countries are The Republic of Korea (ranked 3rd) and Singapore (4th). In Europe, the leading region, e-government is progressing steadily across the continent. The top two e-government leaders in Europe are the United Kingdom (ranked 1st), Finland (ranked 5th) (United Nations, 2016).In Oceania top two performing countries are New Zealand and Australia (United-Nations, 2016).

It is this study view that regional cooperation mechanisms could be strengthened to facilitate national development goals, particularly among those countries with no direct sea access in order to promote e-government development. Table 2-6 illustrates the regional leaders in e-government.

According to Holzer, Zheng, Manoharan and Shark (2014) in his Rutgers global e-governance survey for municipalities (2013–2014), Table 2-7 shows that the City of Johannesburg for South Africa is ranked number 1, followed by Cairo for Egypt. On the bottom of the list is Accra for Ghana.

Table 2-6: Regional e-government leaders

Regional e-government leaders		
Region	**Country**	**Index**
AFRICA	Mauritius	0.6231
	Tunisia	0.5682
AMERICAS	USA	0.842
	Canada	0.8285
ASIA	Korea	0.8915
	Singapore	0.8828
EUROPE	United Kingdom	0.9193
	Finland	0.8817
OCEANIA	Australia	0.9143
	New Zealand	0.8653

Source: United Nations e-government survey (United Nations, 2016).

Table 2-7: World municipal e-governance ranking 2013-14 in Africa

Rank	City	Score	Private	Usability	Content	Service	CS engagement
1	Johannesburg	34.97	6.67	12.51	8.26	5.25	2.29
2	Cairo	21.85	4.82	13.75	3.97	3.44	1.88
3	Logos	21.84	1.11	9.07	7.46	2.95	1.25
4	Tunis	19.56	0.00	15.01	3.65	0.49	0.42
5	Casablanca	18.84	0.00	13.13	3.81	0.66	1.25
6	Nairobi	15.39	0.00	10.32	1.43	3.44	0.21
7	Accra	9.82	2.22	5.32	1.59	0.49	0.21

Source: Holzer, et al. (2014).

2.7.1 Critique of the studies

Currently, there are several metrics applied to measure and rank the e-readiness of various African countries (Sigwejo & Pather, 2016). However, while these measures have provided a source of comparative analysis between different e-government projects, they are far from being perfect (Sigwejo & Pather, 2016).Sigwejo and Pather, (2016) gave the example that most of these measures are diverse and difficult to compare, since they assume 'one size fits all' and ignore differing environmental, cultural and contextual factors of various countries. Sigwejo and Pather, (2016) pointed out that further criticisms of these measures are that they are 'first generation metrics' designed for developed countries, as opposed to developing countries. This study despite the criticism identified by Sigwajo and Pather (2016) used these global surveys as a basis for developing framework for improving service delivery at local government level in a South African context.

2.7.2 Digital divide in Africa

When Mutula (2005) evaluated the digital divide, in developing countries in general and Africa in particular, there is a close connection to the contextual economic environment of the respective countries. Mutula (2005) argued that Africa presents complex problems of digital divide by virtue of its diaspora of varied cultural groups and values and gave an example that Africa has many languages, with virtually none constituting the language of the internet and computing. A study by (Tomas Rivera Policy Institute, 2002) in the USA established that people with limited English-speaking skills lagged behind their English-speaking counterparts in access to computers and the internet. During 2002, it was estimated that English in computer-based communication stood at a high of 80 per cent (Warschauer, 2001). Warschauer (2001) further explained that in sub-Saharan Africa, a large proportion of indigenous people can neither read nor write in English, and as potential users of computers they are disadvantaged. Additionally, there are shortages of resources on the African continent, such as access to PCs, partial internet access, inadequate telephone lines, etc. This situation is worsened by the high cost of access, inappropriate or weak policy regimes, inefficient telecommunication services and a lack of locally created content (Acacia, 1997; Digital-Dividends, 2001).

Fink and Kenny (2003) found that the literature identifies four "gaps" which comprises the digital divide. These are:

i. a gap in access to use of ICTs, crudely measured by, for instance, the number and spread of telephones and web-enabled computers;

ii. a gap in the ability to use ICTs, measured by the skills base and the presence of numerous complementary assets;
iii. a gap in actual use – the minutiae of telecommunications for various purposes, the number and time online of users, the number of Internet hosts, and the level of electronic commerce; and finally,
iv. a gap in the impact of use, measured by financial and economic returns".

Fink and Kenny (2003) went on to explain that scholars either lump these four interpretations together or, simply, focus on one.

Norris (2001) categorized the digital divide into three elements:

i. the global divide between advanced industrialized countries and developing countries;
ii. the social divide between the information rich and the information poor in advanced industrialized countries;
iii. and the democratic divide between those in the online community who do and those who do not use digital resources to engage, mobilize, and participate in public life (Norris, 2001).

Keniston (2004) enriched the concept of digital divide by identifying four types, namely:

(i) the kind that exists in every nation, whether industrialized or developing, between those who are rich, educated, and powerful, and those who are not;
(ii) the linguistic and cultural, which separates those who speak English or another West European language from those who do not;
(iii) the growing digital gap between rich and the poor nations; and
(iv) the emergence of a new elite group, called the digerati, meaning the beneficiaries of the enormously successful information technology industry and the other knowledge-based sectors of the economy, such as biotechnology and pharmacology (Ohemeng & Grant, 2014).

This digital divide is a major concern in this research as South Africa is also affected. This section addressed research question one in Chapter 1 and contributes to the proposed e-governance framework for local authorities in South Africa.

The United Nations Survey (United Nations, 2014) explained that the digital divide arises from broad socioeconomic inequality, and at the root of both are economic and social

disparities between countries, groups and individuals which impact their ability to access and use ICT to promote well-being and prosperity. As such, the digital divide in one form or another affects people both in developed and developing countries. The United Nations Survey (United Nations, 2014) expressed that overall, despite some progress in providing a portfolio of e-services and online information, efforts at mitigating the digital divide in any meaningful way have not reaped large dividends. The United Nations Survey (United Nations, 2014) concluded that although meaningful access to ICT has gone beyond connectivity issues, e-government has still not yet adequately embraced human, economic and social resources, institutional structures and governance networks, which are central to developmental outcomes. In recent years, policy makers have progressively focused on the link between use of new technologies, education and social inclusion, particularly of disadvantaged and vulnerable groups (United Nations, 2014).

South Africa, similar to other developing countries, has, since the inception of democracy, developed a range of strategic initiatives aimed at benefiting the entire population and defeating poverty, illiteracy and unemployment (Mawela, 2016). Verdegem (2011) highlighted the need to eradicate digital inequalities, whilst promoting the participation of all citizens in the information society, particularly those that are currently socially disadvantaged. This is relevant in developing countries such as South Africa, where approximately 45.5% of the population is categorized as poor (Statistics South Africa, 2014), coupled with an unemployment rate of 25.5%. This study therefore aims to develop e-governance framework that will cater for the poor population who cannot afford to access municipality services online.

2.8 Uptake and usage of e-governance for improved service delivery

Sebastian and Supriya (2013) expressed that governments and public sector organizations around the globe are relying on information and communication technologies (ICTs) to reform the functioning of the system and provide better service delivery mechanisms for their citizens. Sebastian and Supriya (2013) further explained that e-governance is the effective use of ICTs, particularly the web-based Internet applications, for better governance and service delivery. The main objectives of the e-governance initiatives include enhanced access to government's services, improved service delivery and modernized day-to-day government operations (Sebastian & Supriya, 2013).

The government uses ICT to make public administrations more efficient and effective by cutting red tape (Mukherjee & Roy, 2016:276). Mukherjee and Roy (2016) further argued

that ICTs can remove unnecessary human involvement during the public service delivery processes from the government. Mukherjee and Roy (2016) expressed that government websites are mainly classified in two categories one-way communication and two-way communication. One-way communication is a process where websites provide information regulations, policies and programs to the citizens, such as downloadable forms for government services and applications and on the other hand, two-way communication is a system which provides policies and programs with requesting and receiving inputs from their citizens (Mukherjee & Roy, 2016). Sigwejo and Pather (2016) emphasised that the implementation of e-government in the current era is obligatory for the government to function in this information age. Sigwejo and Pather (2016) further argued that the needs of people, global competition and new demands of the information age are critical issues, particularly in developing countries. Ismail (2008) explained that in order to enhance e-governance services, various developing countries have launched strategic plans which, according to Ismail (2008) are normally undertaken and implemented following the essential step of e-readiness evaluation. However, these plans are not a guarantee of uptake of use of e-governance services, especially in developing countries which currently have a lower broadband-internet penetration level. It is against this background that this study aims to come up with e-governance framework for improving service delivery at a local level in South African given the lower Internet penetration which currently exists in Africa.

Online local government services and internal process streamlining have helped municipalities contain and even cut costs, the squeezing of public budgets due to reduced tax revenues has remained a huge challenge for local administrators when it comes to the development and continued provision of modern online services and internal overhaul (Scholl, 2014). Faced with this backdrop, local governments have been forced to look at ways to overcome the effects of budget trimming while at the same time meeting the ever-higher expectations of citizens and businesses for modern online services (AlAwadhi & Scholl, 2013). Contemporary cities are characterized by the inequality reflected in uneven geographies of quality of life conditions. When these inequalities are a matter of concern, local governments usually assert their intention to respond to citizen's needs and deprivations (Martinez, et al., 2011). It is in this context that ICT tools as part of e-governance are being incorporated in municipal cities to promote local governance by improving quality of life and increasing efficiency and transparency in the response to citizen's demands and needs.

Mpinganjira (2012) justified that ensuring that people have access to information and communication technologies is not adequate to guarantee that people make use of the services provided. Use of such services often requires some technical skill on the part of users, especially in relation to the use of computers (Mpinganjira, 2012). Mpinganjira (2012) further argued that computer self-efficacy is one of the prerequisites necessary for one to make use of e-services. People who are computer self-efficant have among other things a good understanding of the three stages of data processing, namely, input, processing and output; feel confident making selections from on-screen menus, as well as making use of help menus or user guides when necessary (Mpinganjira, 2012). These skills are often lacking among people who are less educated (Torkzadeh, Chang & Demirhan, 2006). Dada (2006) identified the high illiteracy rate in Africa as one of the impediments to adoption of e-governance services and closely related to literacy rates is the ability to read and write in English. Dada (2006) further expressed the opinion that the content of e-government services is usually available in English, so does not cater for the African people who can read and write in their mother tongue. Language thus becomes another barrier to accessing such services (Mpinganjira, 2012). These arguments will be explored further in trying to address the research question one for this study.

2.8.1 Benefits and challenges of e-governance

In order to understand the uptake and usage of ICT as part of e-governance initiative, it is of paramount important to have an understanding of potential benefits and challenges brought by e-governance. Table 2-8 shows the benefits and challenges of e-governance and e-government.

The potential benefits and challenges identified in Table 2-8 were used to determine if those benefits and challenges identified fifteen years ago are the same as the ones collected through questionnaires and interviews of this study.

Table 2-8: Potential benefits and challenges of e-governance and e-government

Benefits	Associated benefits	Challenges	Associated challenges
Efficiency and modernisation of government	• Reduced costs	**Re-engineering processes**	• Initial costs
	• Increased speed		• Staff re-skilling
	• Greater co-ordination		• Possible re-location
	• Reduced duplication	**Access**	• Ensuring equality of access
Customer focus	• Services delivered where and when needed		• Acquiring material and knowledge resources
	• Resource and time savings for customers		• Providing alternative ('traditional')
Greater security/reduced abuse of the system	• Information checked against multiple data		• Providing alternative ('traditional')
			• delivery channels
	• Complete control of data by service user	**Confidence in e-governance**	• Assuring users of privacy and security
			• Putting appropriate safety protocols in place

Source: Timonen, O'Donnell and Humphreys (2003).

2.8.2 Mobile cellular technology, social media and inclusive multichannel services

There is increasing expectation for easier access to more public information and public services from anywhere, anytime through multiple channels or citizen touch-points (United Nations, 2014). The United Nations Survey (United Nations, 2014) showed that digital channels, with both their diversity and spread, are being increasingly adopted by almost all countries, while counter (face-to-face service) and telephone (voice) services, have continued to serve as fundamental channels. In a number of countries (e.g. Canada and Australia) the problem of 'e-exclusion' has been tackled by combining e-government with other, more traditional channels of service delivery. In practice, this means that services are accessible electronically for those who want to use e-government services, but also over the phone, or in person, for those who are not comfortable with or cannot use e-government services (Timonen, et al., 2003).

Timonen, et al. (2003) further explained that from the service users' point of view, it certainly makes sense to break the organisational boundaries at the front end so that the service

delivery interfaces, whether electronic or conventional, increasingly resemble the one-stop shop model. In 2014, all 193 United Nations Member States have some form of online presence, as compared to 18 countries with no online presence in 2003 and three countries in 2012 (United Nations, 2014). The United Nations (2014) explained that although the use of email increased only slightly between 2012 and 2014 to just over two-thirds of countries, it is likely to continue to grow in the future, especially for notification and information provision. Similar uses are seen for SMS via mobile devices, although still more than 80 per cent of countries have not yet exploited this potential mass channel which is only a slight advance from 2012 (United Nations, 2014). As far as the use of mobile phones themselves are concerned, there are today over 1.5 billion smart phones in use globally, and this is growing exponentially (United Nations, 2014). The above discussion therefore implies that the use of e-governance by citizens will increase through the use of mobile technology.

The United Nations Survey (United Nations, 2014) highlighted that between 2012 and 2014, the number of countries offering mobile apps and mobile portals doubled to almost 50 countries, where they are often used directly to support poverty eradication, gender equality and social inclusion, as well as promote economic development, environmental protection and disaster management. The use of social media by governments is also increasing fast with the number more than tripling from 2010 to 2012 and with another 50 per cent rise in 2014, so that today 118 countries use it for e-consultation and 70 for e-government generally (United Nations, 2014). The United Nations Survey (United Nations, 2014) expressed that both social media and mobile channels typically do not require high investment costs as they ride on consumerisation and non-governmental platforms, but they often need a business transformation and strong commitment in the public administration to maximise benefits. The penetration of social media through mobile technology in South Africa can improve service delivery to its citizens. This research therefore established if these mobile technologies are being used to access services offered by the local authorities.

South Africa has witnessed tremendous growth in mobile phone penetration over the past few years (Lesame, 2014). South Africa has five mobile phone operators: Vodacom, Mobile Telephone Networks (MTN), Cell C, Virgin Mobile, and 8ta (or Heita). As in other African countries, mobile phone penetration has surged to greater levels. A South African Communications Minister called the growth “a mobile miracle” (Pule, 2010). Pule (2010) also declared that mobile cellular subscriptions in South Africa were over 50 million in 2010 (South African e-skills Institute, 2012). Around 10 million phones are sold annually in South Africa, according to Goldstuck (2012), and that smart phones accounted for five (5) million

by 2013. Furthermore, an internet report, by (World Wide Worx, 2012) revealed that cellular phone banking services increased by 37 per cent, and that South Africans in urban and rural areas aged 16 and above use mobile phone banking services for personal and business use. The four biggest mobile phone markets in Africa are Nigeria, South Africa, Kenya, and Ghana (South African e-skills Institute, 2012).The mushrooming of mobile phone operators therefore make it easy for citizens to make use and access online services being offered by local authorities.

2.9 E-governance initiatives in offering quality online services

E-service provides customers with a different experience with the interactive flow of information. Much of research work in e-service quality takes a combination of traditional service quality dimensions and web interface quality dimensions as its point of departure (Field, Heim & Sinha, 2004). Field, et al. (2004) argued that e-service can play a critical role in improving the services quality delivered to its customers as it can achieve survival, increase satisfaction and trust and then generate the competitive success for organizations. Dabholkar (1996) conducted research work on dimensions of e-service quality focusing on web site design. Seven dimensions of e-service quality can be illustrated as the basic parameters in the judgment of e-service quality, including website design, reliability, and delivery, ease of use, enjoyment and control (Dabholkar, 1996).

Cox and Dale (2001) laid down six dimensions of online retailing service quality with the comparison of the traditional dimensions of service quality such as website appearance, communication, accessibility, credibility, understanding and availability. Customers reach satisfaction decision by comparing the performance a product or service with their prior expectations and that if performance exceeds the expectation positive disconfirmation occurs and increases in satisfaction can be expected to take place (Yang, 2001). Saha and Zhoa (2005) stated that providing a good service quality is a major issue for all business.

Online quality service is a key issue to maintain customer satisfaction and customer satisfaction is collective outcome of perception, evaluation and psychological relations to the consumption experience with a product or service (Kalsi, et al., 2009). Kalsi, et al.(2009) have acknowledged that e-government initiatives have a direct impact on the citizens and in which the citizens derive benefits through direct transactions with the governmental services. Al-Tarawneh (2012) in his study on e-service quality and customer perception, provided that responsiveness, ease of use, personalization, security; and website design have influence on customer's perception of e- service quality. Quality of online is therefore important in this

study as it determined the uptake and usage of those services by citizens. The above discussion therefore assists in answering the research questions 1 and 2 in Chapter 1.

2.10 Service delivery for municipalities in South Africa

Municipal Systems Act of (2000), Section 32 (2) of the Municipal Systems Act requires municipalities to have Integrated Development Plan (IDP), which is a process through which municipalities prepare a strategic development plan which extends over a five-year period. Municipal Systems Act of (2000), Section 32 (2) of the Municipal Systems Act explained further that as the IDP is a legislative requirement it has a legal status and supersedes all other plans that guide development at local government level. This study however focused on the service delivery aspect as it is the one which informs the aspects taken into account in the development of e-governance framework for improving service delivery in local authorities in South Africa.

2.10.1 Generic services offered by municipalities in South Africa

Table 2-9 illustrates the general services offered by municipalities in South Africa. However, some of these services are offered by municipalities through their websites such as announcements of water service interruptions and electricity load shedding time table. E-Services is an initiative by the City of Johannesburg which is (also applicable to other Metropolitans and District local municipalities under the study) to provide online access to a range of services for both individuals and business (City Of Johannesburg, 2014). Specific services offered include:

- Log a query or problem;
- Online statements;
- Once registered, customers can update their billing address online;
- Submit meter readings online;
- Track the progress of building plans submitted;
- Fill in the online valuations form to assist the City in evaluating properties correctly; and
- Access GIS mapping services.

Table 2-9: Generic services offered by municipalities

Municipal Service	Service Area
Water	Water bursts
	Sewer Overflows
	Water service interruptions
Electricity	Faulty public lights
	Power outages
	Illegal connections
	No electricity supply
	Unplanned electricity outages
	Damaged electricity meters
	Prepaid meter conversions from conventional meters
	Electricity service interruptions
Roads	Potholes
	Traffic lights
	Missing manhole covers
	Missing stop and traffic signs
	Repair road trenches
	Requests to correct street name spelling
Refuse and Waste Management	Collecting domestic waste
	Collecting general business waste
	Delivery of new wheelie bins ordered by customers
	Delivery of new skips ordered by customers
	Collecting putrescible waste (wet waste)
	Cleaning of illegal dumping spots
	Removal of animal carcasses
	Delivery of an ordered Skip bin
	Collecting refuse bags on the kerbside
	Collection of medical waste
Parks and Cemeteries	Pruning of trees
	Clearing of fallen trees or branches
	Grass cutting in cemeteries
	Maintaining of cemeteries
	Grass cutting in open spaces
Emergency Management Services	Emergency calls
	Priority one emergencies
	Priority two emergencies
	Priority three emergencies
Rates and Taxes	Change of Ownership
	Finalisation of Rates

Source: City of Johannesburg 2012/16 Integrated Development Plan: 2013/14 Review (2014).

2.11 Efforts towards smart cities by metropolitans in Gauteng Province

SALGA (2015) indicated that a number of factors were identified that help determine a municipality's readiness to create a Smart City. These include political will, social capital, digital capability, physical infrastructure, a focus on outcomes, and meaningful public-private partnerships (SALGA, 2015).

- **City of Johannesburg**

City Of Johannesburg (2014) explained that a city can be defined as 'smart' when investments in human and social capital, and traditional (transport) and modern (ICT) communication infrastructure, fuel sustainable economic development and a high quality of life, co-exists with the management of natural resources, through participatory action and engagement. City Of Johannesburg (2014) emphased that the objective of this priority is for Johannesburg to become a smart city, by providing services that are easy to access and use, while being efficient and responsive in an open and transparent way; and ensuring sustainability financially, environmentally and through quality service delivery.

The City of Johannesburg Metropolitan Municipality has embarked on a journey to transform Johannesburg into a Smart City in terms of economy, environment, utilities, transportation, education, health, planning, governance and people (SALGA, 2015). SALGA (2015) indicated that the objective is to provide efficient services that are easy to access and use (using technology as an enabler), being responsive in an open and transparent way, and ensuring financial, environmental and quality service-delivery sustainability. SALGA (2015) explained further that the City's approach is holistic: it is cross-domain and multidisciplinary; it is citizen-and people-oriented (through active engagement); it leverages local infrastructure, connectivity and resources; and it provides an interoperable, common underlying smart platform.

It is envisioned that wide-ranging broadband capacity will be the backbone of the new Smart City. This has been laid down and is facilitating service-based innovations the City has started to implement (SALGA, 2015), such as:

- Affordable broadband connectivity among City-owned facilities, and access in the City through the creation of wireless hotspots at all Rea Vaya BRT stations and in the buses, as well as selected open spaces;
- An Intelligent Operation Centre aimed at providing an integrated view of the city's strategic and operational issues through effective information-gathering and processing,

and efficient dissemination of intelligent information. This will allow for well-coordinated, integrated and responsive service delivery, focusing on public safety in the initial phase;

- Installing households with smart meters to reduce electricity losses, increase revenue, and reduce energy consumption;
- Smart transport technology aimed at addressing current and envisaged future problems affecting travellers and freight users with regard to traffic flow, via the Intelligent Traffic Management System;
- Promoting ICT literacy via Public Access to Internet, which is aimed at enhancing and promoting ICT literacy to all, including disadvantaged communities, via free access to digital information;
- And Universal access: Skills development via ICT Hub IT innovation and SMME incubation, with a focus on application development in collaboration with the Universities of Johannesburg and the Witwatersrand.

These benefits therefore can also be enjoyed by other metropolitans and District local municipalities in South Africa if e-governance is properly implemented.

- **City of Tshwane**

Connectivity and economic growth

City of Tshwane is a society of unequal opportunities on many fronts, often contributing to the widening of the gap between the rich and the poor (Ramokgopa, 2014). In the current digital economy, a lack of access to internet connectivity denies the poorest in our society the requisite opportunities to access basic knowledge to help them change their plight (Ramokgopa, 2014). This excludes them from participating in the mainstream economy with disastrous consequences for the country (Ramokgopa, 2014). Ramokgopa (2014) explained that the City of Tshwane has therefore embarked on various initiatives to alter this undesirable situation. Ramokgopa (2014) highlighted that City of Tshwane perspective is that access to connectivity must be viewed as a basic human right, analogous to the provision of basic services such as water and electricity. Tremendous progress has been made in closing the digital divide and expanding internet connectivity (Ramokgopa, 2014).

Ramokgopa (2014) expressed that City of Tshwane has made history by becoming the first metro to roll out free Wi-Fi and indeed the announcement of the provision of this service was made before the City of New York's announcement – this is indeed a ground-breaking achievement for an African city. Ramokgopa (2014) indicated that The City of Tshwane will

expand the project and roll out about 600 additional Wi-Fi hotspots throughout Tshwane, prioritising institutions of learning. This unprecedented intervention will set up Tshwane as an e-capital of excellence and a driver of country's education aligned to the creation of a smart city (Ramokgopa, 2014). Ramokgopa (2014) highlighted that The City has moved away from manual business processes, which are often tedious and cause unnecessary delays in rendering services to our people and therefore in this regard, the City of Tshwane have taken a bold step and implemented an online transacting system, e-Tshwane. Amongst other advantages, e-Tshwane will make services available online all hours every day and provide a real-time update of accounts to avoid unnecessary inconvenience from cut-offs in instances where accounts have not been paid. (Ramokgopa, 2014) indicated that over 30 000 account holders are already using the system that was launched in November 2013. This is bold step towards the national realisation of e-governance services (Ramokgopa, 2014). This study therefore unpacked the uptake and usage of ICT tools by citizens of Tshwane as part of e-governance by involving participants through questionnaires.

- **City of Ekurhuleni**

SALGA (2015) explained that The City of Ekurhuleni is referred to as 'Africa's workshop' because it has the largest concentration of companies producing goods and commodities on the continent. Goods need to be moved, and this is supported by Ekurhuleni's diverse network of roads and rail lines (SALGA, 2015). SALGA (2015) highlighted that to keep pace with the demands of these bulk customers, the metro has put in place a cutting edge electronic metering-in-place system that allows businesses to track their utilisation throughout the month. This allows them to manage consumption and keep within budget and this will soon be reinforced by a range of new smart meters for both electricity and water, which will improve the efficiency of metering and billing (SALGA, 2015). Some features of the system include remote readings and automated real-time readings and Ekurhuleni has also taken note of the need to improve its ICT network to make sure that its fibre and wireless grid is properly connected and maintained. SALGA (2015) indicated that there are plans to introduce an ICT operations centre, which by 2016 will provide the basis for the city delivering WIFI service not only to its employees, but also to households and businesses. SALGA (2015) conclude that this will put Ekurhuleni well on the path to being a Smart City that is able to service both its business and domestic customers in a modern way.

2.12 Chapter conclusion

This chapter started by giving an overview of e-governance and e-government. The concepts encapsulated in e-governance are discussed, namely; e-governance as customer satisfaction, e-governance as a process and interaction, and e-governance as a tool. The major pillars of e-governance, which forms the basis of this study, are defined. This is followed by the discussion of a survey carried out by Holzer, et al. (2014) for Rutgers 2013/14 by giving an overview of global e-governance in large municipalities' world over. The rankings determined by the results of the United Nations e-government survey (United Nations, 2014) on 193 United Nations member states are compared. E-governance and e-government in African municipalities are discussed, as well as the challenge of the digital divide in Africa. The uptake and usage of e-governance for improving service delivery is discussed. Benefits and challenges of e-governance are also highlighted. Mobile cellular technology, social media and inclusive multichannel service as a way of encouraging citizens to participate in e-governance is discussed. E-governance initiatives in offering quality online services are highlighted. Service delivery for municipalities in South Africa is discussed with reference to the generic services offered by the municipalities in Gauteng Province. The chapter concludes by discussing the metropolitan efforts towards smart cities in Gauteng Province. The next chapter is going to discuss the theoretical and conceptual framework of this study.

CHAPTER 3: UNDERPINNINGS OF E-GOVERNANCE AND CONCEPTUAL FRAMEWORK

3.1 Introduction

This section highlights theories relating to e-governance and how these theories can be integrated in order to come up with a conceptual framework for e-governance in the South African context that will improve service delivery in local authorities.

The difference of a theoretical and conceptual framework is discussed in the literature review. Neuman (2014) explained that a theoretical framework is a very general theoretical system with assumptions, concepts, and specific social theories. Badenhorst (2012) described the theoretical framework as a thread which runs through the entire research, from the beginning until the final conclusion. This is distinguished from a conceptual framework which is formed by the key concepts used in this research and identifies the relationships between the key concepts. Conceptual framework therefore provides the basic outline for analyzing the data and drawing conclusions (Badenhorst, 2012).

Prabhu (2012) indicated that models of digital governance are still evolving in developing countries. A few generic models have shaped up, which are finding greater recognition and are being replicated (Prabhu, 2012). Hence, the need for this research to describe a framework for e-governance, which improves service delivery in local authorities in the South African context. Prabhu (2012) interpreted that these models are based on the inherent characteristics of ICT such as enabling equal access to information across the entire digital network and de-concentration of information across the entire digital network, connecting all sources of information. Prabhu (2012) explained that hierarchy is inherent in the government departments hence, equity based information flow may not be always compatible with government functioning. Therefore, appropriate administrative reforms and some reengineering may be required before e-governance may be really implemented (Prabhu, 2012).

The process for the review of literature included decisions regarding the inclusion criteria, the search for relevant research studies, and finally analyzing the identified articles (Hyvärinen & Beck, 2018). In order to address research questions and objectives of the study, the literature review on empirical studies was done on debate around e-governance and e-government, global e-governance and e-government in municipalities, uptake and usage of e-governance for improved service delivery, e-governance initiatives in offering

quality online services, service delivery for municipalities in South Africa. This study also used the following models in understanding the topic at hand and to come up with e-governance framework for local authorities for improving service delivery in South Africa:

- Interactive-Service Model (Nath, 2005)
- Technology Acceptance Model (Davis, 1989)
- Broadcasting/Wider Dissemination Model (Nath, 2005)
- Synthesized Stage Model (Siau &Long, 2005)
- Critical Flow Model (Nath, 2005)
- Information System Success Model (DeLone& McLean, 1992)
- DOI Model (Rogers, 1995)
- Comparative Analysis Model (Nath, 2005)
- Mobilisation and Lobby Model (Nath, 2005)
- Information Behaviour Model (Wilson, 1999)

The multiple models used in this study take advantage of the strength of each model in order to come up with e-governance framework for improving service delivery at local authority level in the South African context. These models however are not going to be discussed in isolation, but are blended with other theories in order to come up with e-governance framework that improves service delivery in local authorities in the South African context as shown in Table 3-1.

Table 3-1: Blending of theories.

Name of Theory	Blending Theory
Broadcasting/Wider Dissemination Model (Nath, 2005)	• Siau and Long (2005)Synthesized Stage Model
Critical Flow Model	• Chadwick and May (2003) The Consultative Model
Comparative Analysis Model	• Chadwick and May (2003) The Participatory Governance Model
Mobilisation and Lobby Model	• Chadwick and May (2003) The Disciplinary Model
Interactive-Service Model	• Davis (1989) Technology Acceptance Model (TAM)
	• DeLone and McLean (1992) Information System Success Model
	• Rogers (1995)DOI Model
	• Wilson (1999) Information Behaviour Model
	• Ifinedo (2006) Government-to-citizen (G2C) Model

3.2 Theories of e-governance

3.2.1 Broadcast/wider dissemination Model

Nath (2005) developed the Broadcast/Wider Dissemination Model illustrated in Figure 3-1.The Nath (2005) model is based on dissemination of information relevant to better governance that is already in the public domain into wider public domain through the use of ICT and convergent media. The rationale behind the Nath (2005) model is that a more informed citizenry is able to better understand the governance mechanisms and is more empowered to make informed choices and exercise its rights and responsibilities. The Nath (2005) model has a greater likelihood that society in which the individuals are equally informed will ensure that the agenda and forms of governance are not biased to favour a few. Nath (2005) argued that the Wider Dissemination Model opens up an alternate channel for people to access information, as well as validating information available in the local domain from external sources. Nath (2005) explained that the widespread application of this model gradually corrects the situation of information failure and provides people with the basic government-related information to come to a common understanding and decide upon the future course of action.

Nath (2005) explained that this model is the first step to more evolved forms of digital governance models and is the most crucial one as it catalyses free access and flow of information to all segments of the society and serves as the building blocks to better governance. The model, however, losses its effectiveness where free-flow of information is not encouraged or is not an objective (Nath, 2005).

This model is however augmented by Batho Pele principles entrenching public service delivery. South Africa inherited a public service that was not people-friendly and staff lacked the skills and attitudes to meet the developmental challenges facing the country (Luthuli & Kalusopa, 2017). Batho Pele is a policy that lays out principles on how public officials ought to deal with citizens. The eight principles of Batho Pele are consulting users of service, setting service standards, increasing access to information, ensuring courtesy, providing more and better information, increasing openness and transparency, remedying mistakes and failures, and getting the best possible value for money (Twinomurinzi, et al., 2012). The principles set out in Batho Pele are all aimed at instigating a participatory approach to public service delivery which is citizen-centred using, among others, strategies which are driven by ICT (Twinomurinzi, et al., 2012). This model was therefore used in this study to establish whether municipalities in South Africa are providing the relevant information to their citizens through their websites.

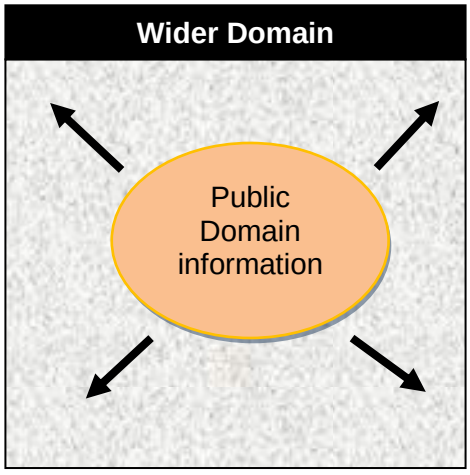

Figure 3-1: Broadcasting/Wider Disseminating Model. Source: Nath (2005)

The current research study applied the Siau and Long (2005) Synthesized Stage Model to fully understand the Wider Dissemination Model, integrated with the Models developed in 2000 and 2001 by West's (2000) 4-stage model and United Nations' (2001) 5stage model.

The benefits of this Siau and Long (2005) Synthesized Stage Model are as follows:

1) The integration is comprehensive as it covers main aspects from various models.

2) This model integrates different ideas, such as ICT, institutions, management and politics.

The Synthesized Stage Model can be used to gather mixed method data to evaluate the e-governance's stage of growth (Siau & Long, 2005). This model can be applied to establish possible macro environmental aspects such as political, economic, social and technological as they impact and influence e-governance growth.

This research used this model to establish e-governance status, use and adoption in the local authorities in a bid to improve service delivery. Figure 3-2 shows the stages of the development of e-governance. From the selected municipalities, web presence is available from all the municipalities under the study which is the first step towards digital governance. Presence of website in these municipalities is also the most crucial one as Nath (2005) regards it as a catalyst for free access and flow of information to all segments of the society. In 2016 the City of Ekurhuleni, City of Johannesburg, and City of Tshwane were at the stages of Interaction and Transaction and were trying to move towards the Transformation stage, which calls for a political will from the councillors and mayors of the respective municipalities. However challenges of digital divide and poor infrastructure affect the efforts to move towards transformation and e-democracy stages.

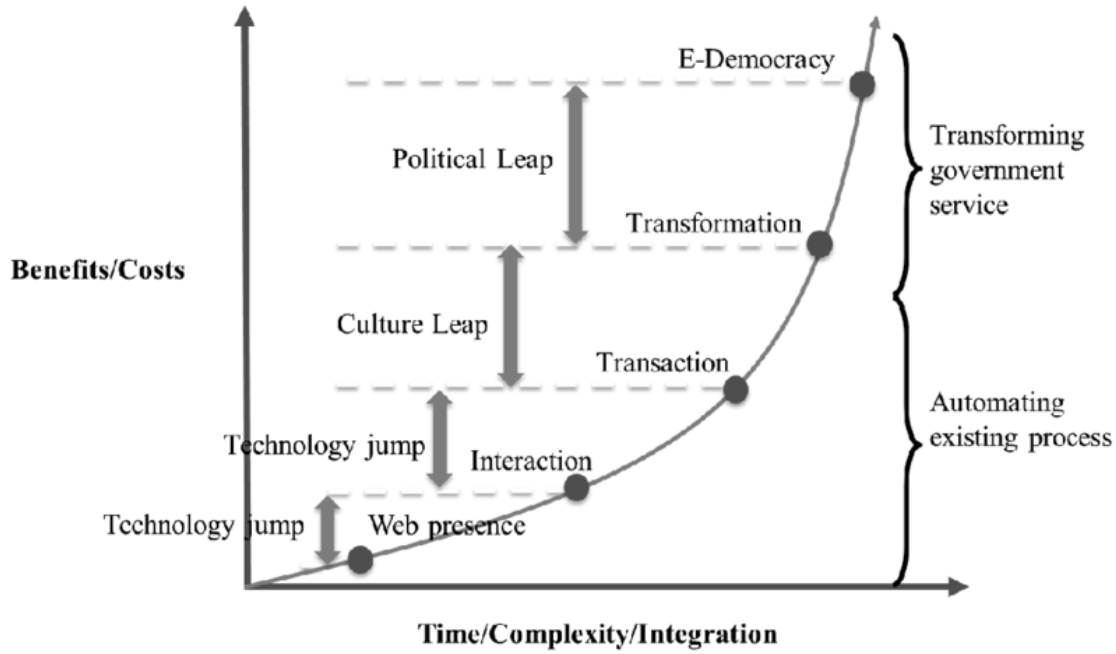

Figure 3-2: Four Stage Model. Source: Siau and Long (2005)

3.2.2 Critical Flow Model

Nath (2005) designed another crucial model called Critical Flow Model as shown in Figure 3-3. Nath (2005) Model is based on channelling information of critical value to a target audience or spreading it in the wider public domain through the use of ICT and convergent media. Nath (2005) Model requires foresight to understand the significance of particular information set and use it strategically. It may also involve locating users to whom the availability of a particular information set would make a critical difference in initiating good governance (Nath, 2005).Nath (2005) appraised that the strength of Critical Flow Model is the inherent characteristic of ICT that makes the notion of distance and time redundant.

Nath (2005) further explained that the application of the Critical Flow Model involves making the following available:

a) information on corruption (by an appropriate legal authority) of a particular government ministry or government officials, to its electoral constituency or to the concerned governing body;

b) research studies, enquiry reports and appraisals commissioned by the government to the affected parties;

c) human rights violation and criminal impeachment records against government officials to NGOs and concerned citizens; and d) environment related information to local communities, for example information on radioactivity spills, effluent discharge in rivers, green ratings of a company.

Nath (2005) outlined that the Critical Flow Model is more focused in terms of its information content and its intended users. Nath (2005) synthesized that due to critical aspect of information, the Model exposes the weakest aspects of governance and decision-making mechanisms and informs people about specific cases of the state failure and bad governance to build up a case for concerted action. At the same time, by fuelling public unrest, the Model exerts pressure on the concerned government institutions and individuals to take into cognizance the interest and opinion of the masses in decision making processes (Nath, 2005). Nath (2005) inferred that this Model does not work in cases where government mechanisms do not foster public debates and censure all information of critical nature. Nath (2005) defended that it will also fail where the government maintains a tight control over all

information. This Model is important for this study as local authorities have so many stakeholders such as citizens, councillors, NGOs, civil organisations who require certain information from their local authorities.

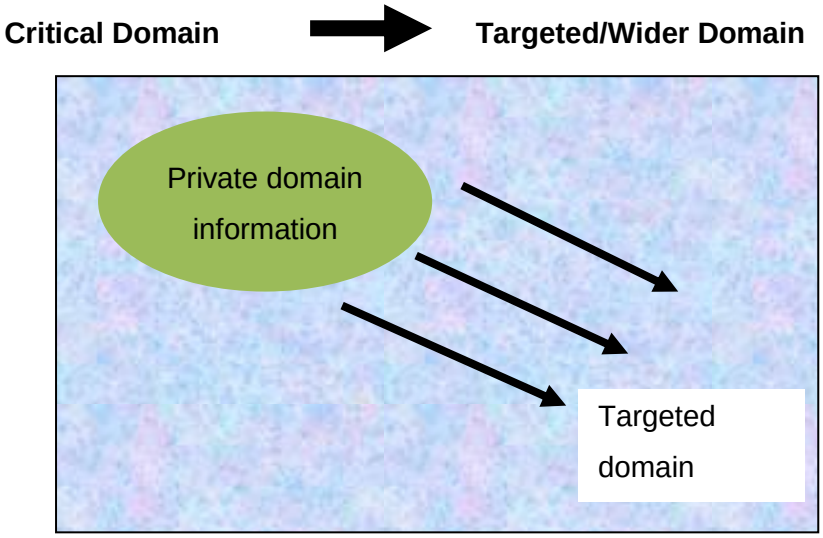

Figure 3-3: Critical Flow Model. Source: Nath (2005).

Critical Flow Model can be integrated very well with the Chadwick and May (2003) Consultative Model. The Critical Flow Model promotes some degree of citizen/state interaction. Im,Porumbescu & Lee (2013) pointed out that ICT is used to facilitate the flow of information from citizens to government. Im, et al. (2013) explained that this afford citizens a predefined, or (politically) relevant, space in which they can interact with the government by sharing their opinion on certain issues and thereby effect change. The state regulates from the top, but in response to the request of civil society organizations, business groups, and other organised interest groups (Im, et al., 2013). According to this governance model, civil-society partners and private-sector service providers are expected to be involved in governmental activities both to localize and to focus service delivery, but also to provide feedback into policy making (Chadwick & May, 2003). Here e-governance is seen as an opportunity to interlink various pre-existing legacy systems (such as databases and infrastructure) across silo-like administrative boundaries (e.g. health care policy that intersects with social care, education, and policing) (Im, et al., 2013). These two models are therefore integrated in this study as civil society and other pressure groups plays an important role in making e-governance initiatives successful for municipalities in South Africa and world over.

3.2.3 Comparative Analysis Model

Nath (2005) came up with the Comparative Analysis Model as shown in Figure 3-4.The Nath (2005) Comparative Analysis Model is based on exploring information available in the public or private domain and comparing it with the actual known information sets to derive strategic learnings and arguments. Nath (2005) highlighted that the model continuously assimilate new knowledge products and uses them as a benchmark to evaluate, influence or advocate changes in current government policies and actions. Nath (2005) evaluated that the comparison could be made over a time scale to get a snapshot of the past and present situation (before-after analysis) or between two different situations to understand the effectiveness of an intervention (with or without analysis). Nath (2005) defended that the strength of this model lies in the boundless capacity of ICT to store information in a retrievable manner and transmit it almost instantaneously across all geographical and hierarchical barriers. Nath (2005) synthesised that developing countries can effectively use this model to their advantage as ICT opens access to global and local knowledge products at a relatively low -cost. Watchguard organisations and monitor-groups could use the model to track the performance records of electoral candidates and share them in their constituency (Nath, 2005).

Nath (2005) expressed that the model is however reliant on the availability of comparative information sets and the ability of users to analyse and bring out strong arguments or self-explanatory graphics from the analysis. Nath (2005) further argued that the model becomes ineffective in absence of a strong civil society interest and short public memory. Nath (2005) separated that this model can be used for empowering people by matching cases of bad governance with those of good governance, and then analyzing the different aspects of bad governance and its impact on the people. This model is relevant to this study as it will assist to incorporate e-democracy as suggested by Siau and Long (2005) in proposed e-governance framework, whereby councillors and mayors are elected online through e-voting and the results are known by the citizens.

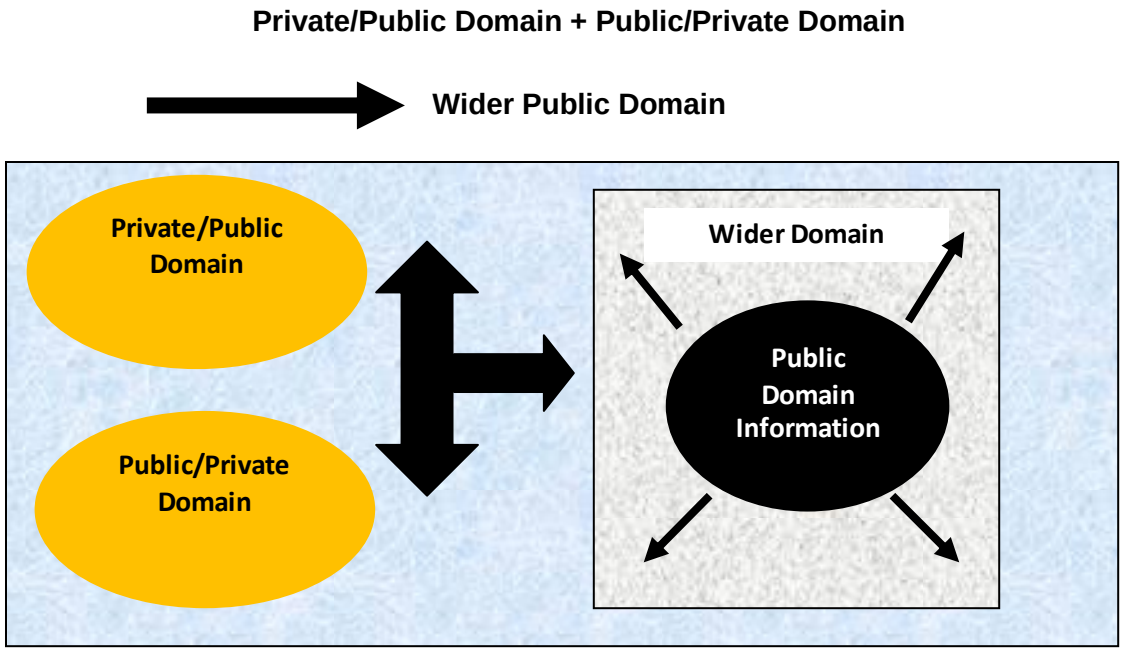

Figure 3-4: Comparative Analysis Model. Source: Nath (2005).

This model is blended with the Participatory Governance Model proposed by Chadwick and May (2003). Chadwick and May (2003) explained that the model looks beyond consultation and aims directly at facilitating free speech and the right of expression for diverse social actors by increasing the level of electronic mediation, civil-society involvement, and democratic representation. Chadwick and May (2003) proposed that the participatory model implies a citizen-centric shift, whereby the focus of government's ICT adoption is to expand and deepen the degree of citizen interaction with the government. Chadwick and May (2003) highlighted that such a model seeks to extend the representation base upon which important political decisions are taken. Voluntary associations, interest groups, and other deliberative autonomous groups are perceived as important means to increase citizens' engagement in policy making and as constitutive of democratic foundations of the liberal state (Chadwick & May, 2003). Im, et al. (2013) argued that this model generically refers to service delivery focus and that in this model, participation is not drawn upon specifically to promote or target services for groups. Rather the objective is to increase political participation by for example e-partition, online discussion lists (Im, et al., 2013).

3.2.4 Mobilisation and Lobby Model

Another interesting model which Nath (2005) developed is the Mobilisation and Lobbying Model illustrated in Figure 3-5.Nath (2005) highlighted that the model is one of the most frequently used digital governance model and has often come to the aid of the civil society

organisations in developing countries to impact international decision making processes. Nath (2005) argued that the model is based on planned, directed, strategic flow of information to build strong virtual allies to strengthen action in the real world. Nath (2005) expressed that it takes up the pro-active approach of forming virtual communities which share similar values and concerns, promoting active sharing of information between these communities, and linking them with real world activities. Nath (2005) explained that the strength of this model is in the diversity of its virtual community, and the ideas, expertise and resources accumulated through virtual forms of networking. Nath (2005) elaborated that the model is able to effectively overcome geographical, institutional and bureaucratic barriers to shape concerted action. The model also provides a strong virtual arm to several activities such as directing campaigns against a particular individual or decision-making body (Nath, 2005).

Nath (2005) illustrated that the model has grown tremendously since the onset of debates for the Seattle round of World Trade Organisation (WTO) in 1999 when it saw the formation of several virtual communities to advocate the concerns of developing countries in the WTO agreement. Nath (2005) further argued that the display of a unified civil society force at Seattle was in many ways a result of intensive discussions that took place over virtual networks months prior to the summit. Nath (2005) explained that the discussions taking place over the virtual network fed into regional level action plans that built into the global movement. Nath (2005) recognised that the mobilisation and lobbying model enhances the scope of participation of individuals and communities in policy issues and debates. Nath (2005) demonstrated that the model also creates an effective deterrent for government bodies and individuals to be watchful in their actions lest they turn the opinion of local and global community against them. Nath (2005) highlighted that this model could be effectively used by the government to encourage public debates and to gauge public opinion on a particular issue as a part of good governance strategies (Nath, 2005). This model is important for this research as South Africa have lobby groups who are also concerned with the services offered by local authorities to citizens in South Africa. This model assist in addressing all the three objectives mentioned in this study. Municipalities in South Africa can therefore have community forums as lobby groups that can rise issues of service delivery and other community related issues hence this model is important for this study.

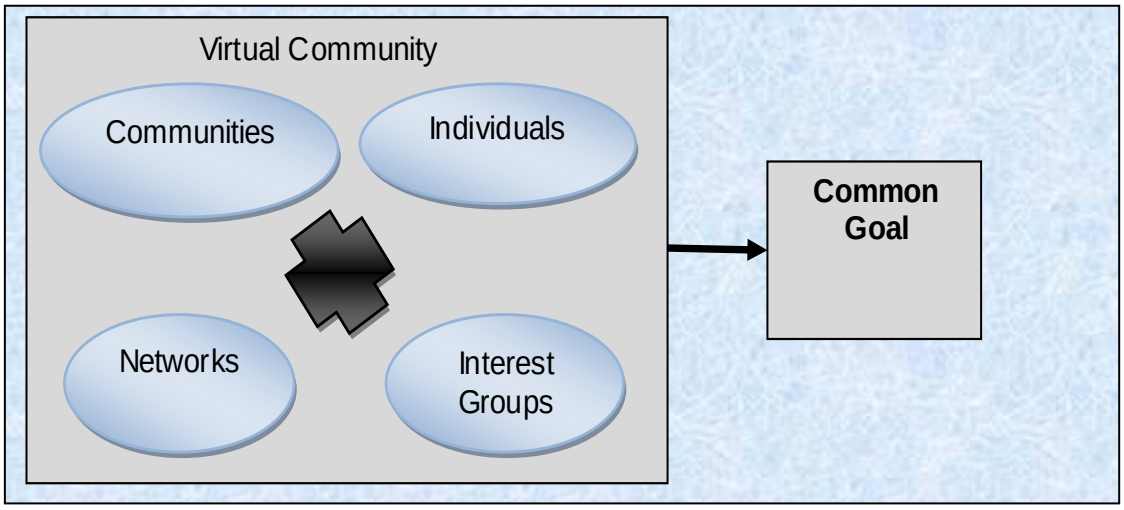

Figure 3-5: Mobilisation and Lobby Model. Source: Nath (2005).

This model was used in conjunction with the Chadwick and May (2003) Disciplinary Model. The model recognised that e-government is not just about efficiency, service delivery, and participation, but also about embedding rules to discipline citizens and providers, and to enforce welfare-increasing policies (Chadwick & May, 2003). As is well understood in the popular discussion of computers, databases, piracy, and issues of information governance, the technologies at the heart of e-governance have great potential to track the individual and enforce rules (Chadwick & May, 2003). Here governance is seen as enforcement of welfare policies to promote growth, equality, and development (Cirorra & Navarra, 2005). This model's service delivery is focus and is quite specific- it constraints the individual for the benefit of the plurality (Cirorra & Navarra, 2005). Im, et al. (2013) argued that in the e-government literature such as a strong model of e-governance is seldom directly addressed, other than in the contest of privacy, surveillance, and monitoring. Still, much of the wider contemporary political debate over ICT in governance is around such concerns (Im, et al., 2013). This model is important for this study as it allowed this research to have in-built disciplinary measures within e-governance aspects in order to prevent citizens and municipal officials to misuse or abuse e-governance systems as advocated by communities, individuals and interest groups.

3.2.5 Interactive Service Model/Government to Citizen to Government Model (G2C2G)

Nath (2005) developed the Interactive Service Model as shown in Figure 3-6, which is used as a pillar in this research to develop e-governance framework for improving service delivery

for local authorities in South Africa. Nath (2005) highlighted that Interactive-Service Model in many ways is a consolidation of the earlier digital governance models and opens up avenues for direct participation of individuals in the governance processes. ICT, as mentioned earlier, have the potential to include every individual within a knowledge network and enable interactive communication channels among them (Nath, 2005). This model fully captures the potential of ICT and leveraged it for greater participation, efficiency and transparency in functioning of the government as well as savings in time and costs relating to decision-making (Nath, 2005).

The Government-to-Citizen (G2C) Model was introduced by Ifinedo (2006) as one of his four types of broad citizen-centered groups. Interface is formed between the government and citizens, which assists the citizens to benefit from efficient delivery of large range of public services (Akula, et al., 2014). Akula, et al. (2014) indicated that this expands the availability and accessibility of public services on the one hand and improves the quality of services on the other. Ifinedo (2006) highlighted that this model refers to the service delivery that involves the building of web pages for one-stop services for citizens. Rani (2007) reiterated that in the G2C model the government interacts with the citizens to provide information and various services. Rani (2007) aurged that information about government services is published on the websites and citizens have access to information regarding procedures for getting the job (education, e-medicine, e-registration, and e-transport) and that citizens can submit applications and make online payments.

Rani (2007) indicated the need to have a two way interaction and suggested the model of Citizens-to-Government (C2G), whereby citizens provide information regarding themselves—their preferences, suggestions and complaints to the government through e-governance (E-democracy, E-voting) (Rani, 2007).Rani (2007) indicated that citizens can also launch complaints and redress their grievances. This is an important model which addresses the research questions in Chapter one and is the starting point in evaluating the usage and uptake of ICT as part of e-governance in improving service delivery in local authorities. This model has been blended with the Interactive Service Model as it has the characteristics of Government to Citizens to Government G2C2G.

Nath (2005) argued that the Interactive Service Model makes possible the various services offered by the government to be directly accessible to the citizens. Nath (2005) further expressed that it creates an interactive Government to Consumer to Government (G2C2G) channel in various functions such as election of government officials (e-ballots); filing of tax returns, procurement of government services, sharing of concerns and providing expertise;

conducting opinion polls on public issues, and grievance redressal. Nath (2005) defended this model for application more embedded in developed countries and has often been proposed for replication in developing countries and such forms of solution-transfers may not be very effective. Nath (2005) distinguished that the model is on the higher end of technology-reliance as compared to the other models. This makes it difficult to replicate in developing countries in absence of individual and secure ICT access (Nath, 2005). This research therefore developed e-governance framework that improves service delivery in South African context despite the challenges highlighted previously.

Nath (2005) highlighted some of the situations in which the model could be used are:

- Establishing an interactive communication channel with policy-makers such as videoconferencing and online dialoguing.
- Conducting electronic ballots for the election of government officials and other office bearers.
- Conducting public debates/opinion polls on issues of wider concern before formulation of policies and legislative frameworks.
- Filing of grievances, feedback and reports by citizens with the concerned governmental body.
- Performing governance functions online such as revenue collection, filing of taxes, governmental procurement, payment transfers etc.
- Carrying out video-conferencing, on-line discussion with policy makers.

Interactive Service Model/Government to Citizen to Government Model (G2C2G) is used in conjunction with other models which developed in 1992 namely; Information System Success Model by DeLone and McLean model (1992) to assess the system quality, information quality, service quality, system use, user satisfaction, and net benefits for using municipality websites to access online services. This model is used in this research to establish the significant role of information accessibility in e-governance adoption success at a local government level.

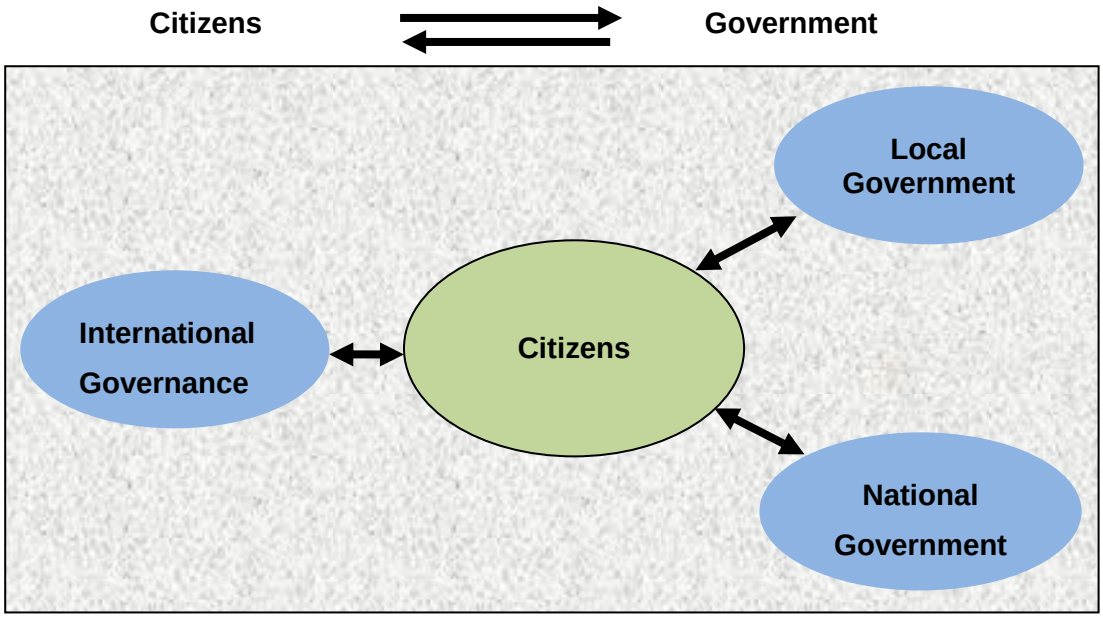

Figure 3-6: Service Delivery Model. Source: Nath (2005).

Studies carried out by Colesca and Dobrica (2008)and Bwalya and Healy (2010) have researched the use of e-government services by applying technology acceptance models, such as the Technology Acceptance Model (TAM) depicted in Figure 3-7 and the Diffusion Of Innovation theory (DOI).

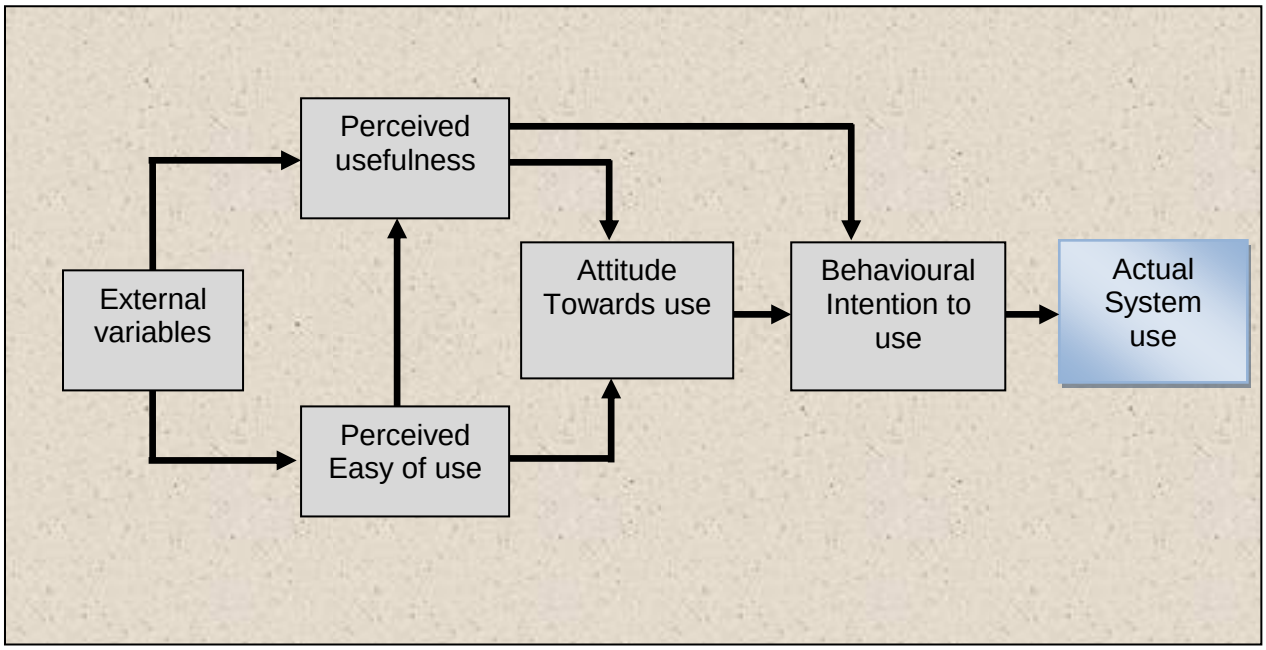

Figure 3-7: Technology Acceptance Model (TAM). Source: Davis, Bagozzi & Warshaw (1989).

Both the TAM and DOI models provide useful insights and implications for understanding an individual's intention of using e-governance online services. Eickelmann and Vennemann

(2017) argued that TAM), introduced by Davis (1989), is one of the first acceptance models to take account of the psychological factors that affect the acceptance of technology. Eickelmann and Vennemann (2017) categorically expressed, that based on the theory of reasoned action, the TAM models the causal relationships of perceived usefulness, perceived ease of use, attitudes towards computer use, external variables, and behavioural intention to use ICT in Figure 3-7. According to the TAM, two central beliefs have a direct effect on attitudes towards ICT: 'perceived usefulness' and 'perceived ease of use'. Perceived usefulness is defined as "the subjective probability that using a specific application system will increase a person's job performance within an organizational setting"(Davis, et al., 1989).Perceived ease of use refers to the extent to which a person believes that using a certain computer system or application is free of effort (Eickelmann & Vennemann, 2017).

Rogers (1999) identified main barriers when implementing new technologies such as e-governance. Her results showed that the external barriers to ICTs can be grouped into three different sub-dimensions or categories (Eickelmann & Vennemann, 2017). The first of these is the 'availability and accessibility category' (Rogers, 1999), which includes the 'limited access to useful, relevant, and appropriate hardware and software' (Rogers, 1999). Eickelmann and Vennemann (2017) indicated that the second is the (lack of) technological, technical, social, and institutional support. The third category of external barrier is stakeholder development and this cluster subsumes all obstacles to the adoption of technology encountered both at the individual and the institutional level (Eickelmann & Vennemann, 2017). From an internal perspective, Rogers (1999) identified one central barrier, namely the attitudes and beliefs of users (Eickelmann & Vennemann, 2017). 'Attitudes toward technology and its uses in education as well as attitudes toward the level of institutional support available play a substantial role in determining what will and will not be considered' (Rogers, 1999).

Furthermore, as Siegel (2008) conclude, the Technology Acceptance Model lacks insight about the effect of motivation on technology acceptance. The models are however used in this study to evaluate citizen adoption of e-governance by the residence of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. To solve the drawbacks of these models this research applied other models, which include the external factors and the information needs factors not covered by e-government adoption models. The Siau and Long (2005) Model is used in the research to explain the external factors, which are culture,

political situation, economics and computer technology to add value to the other models of e-governance discussed above. The Wilson (1999) Model explain human behaviour (information needs) has been used in collaboration with e-governance models discussed above. The Wilson (1999) Model addresses how needs prompt people's information seeking behaviour, source preference, and why some people are more successful than others in pursuing a goal. This study adopted Wilson's (1999) Model to answer the following research question: Why is there a low uptake and usage of ICT by citizens at a local government level in South Africa?

3.3 Conceptual Framework

In this section the conceptual framework is highlighted and the related hypotheses are formulated. The literature review in the previous sections highlighted the theoretical components of the conceptual framework, which illustrate key factors concerning e-governance development, adoption and implementation. The proposed e-governance framework adopted TAM, the model of e-governance (Nath, 2005).The way the model is applied to e-governance needs to encourage the use and acceptance of technology by citizens in accessing municipality services. The Siau and Long (2005) Model is used to determine some factors (ICT, human development situation, economics, culture and political environment). The model proposed by Wilson (1996) is used to explore and explain the e-governance information requirement by citizen who access municipality services, The DeLone and McLean Model (1992) is used to measure quality aspects of municipality websites and user satisfaction and trustworthiness. The research framework is depicted in Figure 3-9.

The study used independent variables in Figure 3-8 and Figure 3-9, namely ICT and other macro-economic factors of political economic and social. A dependent variable is defined as a composite indicator that reflects the accessibility and the level of interaction of online services provided to different stakeholders by local authorities.

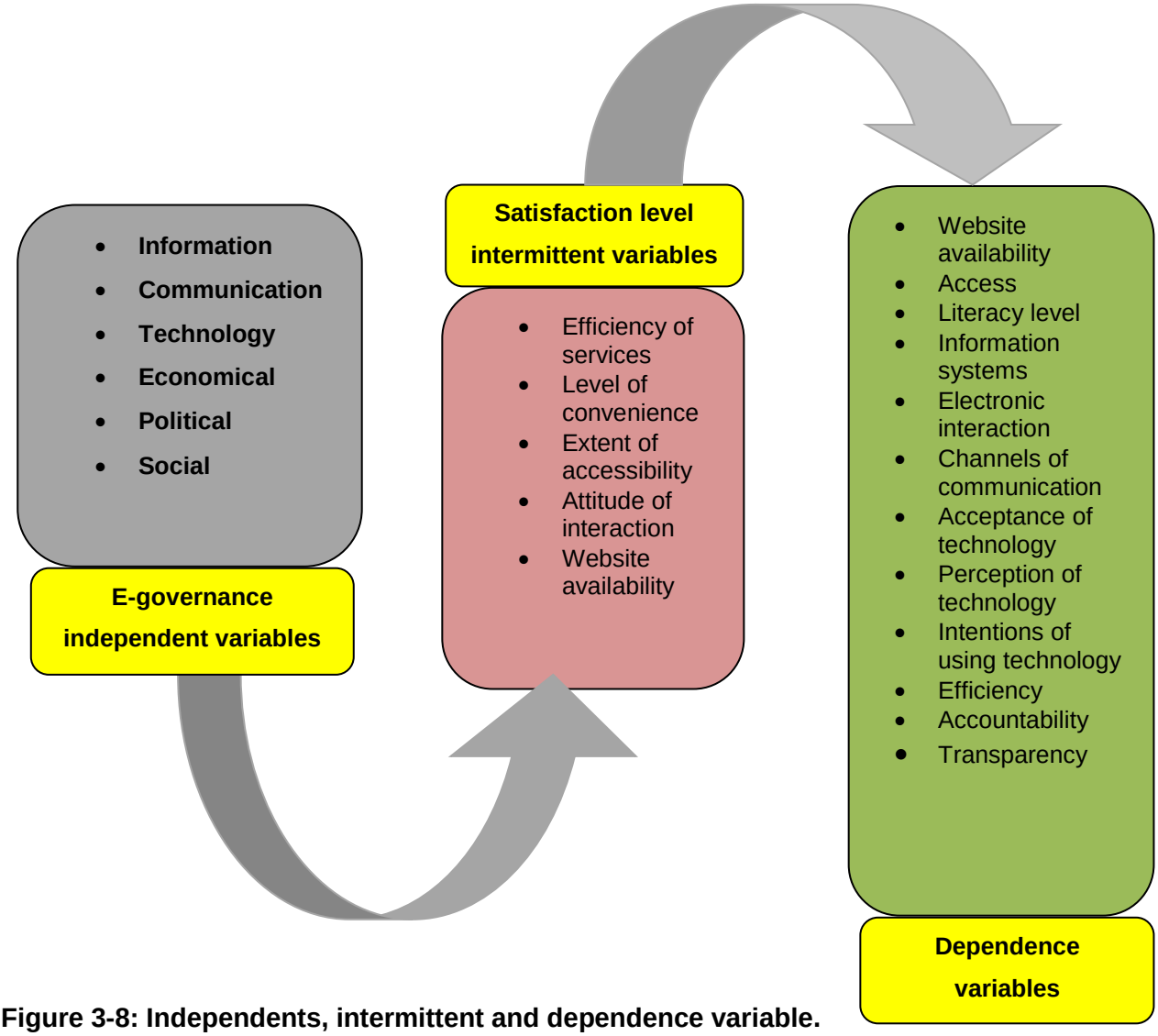

Figure 3-8: Independents, intermittent and dependence variable.

The variables used include:

1) website availability,

2) information systems,

3) access,

4) channels of communications,

5) electronic interaction – Government to Citizens (G2C), Government to Employees (G2E), Government to Business (G2B) and Government to Government (G2G),

6) literacy level,

7) acceptance of technology,

8) perceptions on technology,

9) intentions of using technology,

10) efficiency,

11) accountable,

12) transparency.

The variables are found to be related to service delivery through Spearman's correlation matrix and the logistic regression model is used to establish their relationships.

3.4 Chapter conclusion

This chapter covers the theories of e-governance discussed by Nath (2005), Interactive-Service Model (Nath, 2005), Technology Acceptance Model (Davis, 1989), Synthesized Stage Model (Siau & Long, 2005), Information System Success Model (DeLone& McLean, 1992), DOI Model (Rogers, 1995), Information Behaviour Model (Wilson, 1999). The design of the conceptual framework is based on the definitions of e-governance and e-government, as well as the theories of the different models discussed in this chapter. Independence, intermittent and dependence variables are also identified and discussed. The next chapter will discuss the research methodology used for this study.

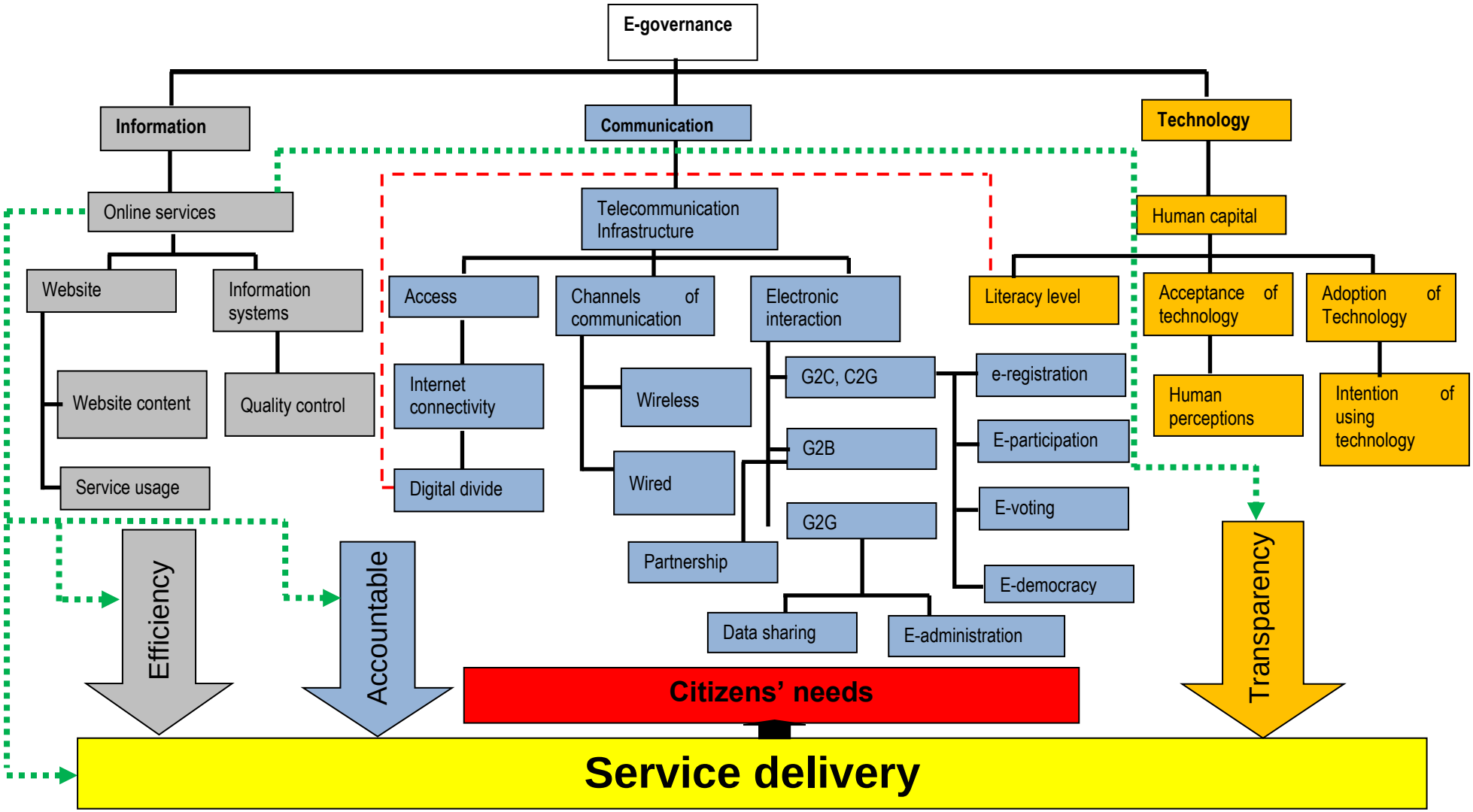

Figure 3-9: Proposed Conceptual Framework.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction

The previous two chapters discussed the research literature and underpinnings of e-governance and a conceptual framework for the current study. This chapter highlights the research methodology for the study and types of research approaches, research reasoning, research paradigm, research design, research strategy, population, sampling, data collection and data analysis. The chapter ends by discussing the quality and rigour of the research, as well as the ethical considerations.

4.2 Research methodology

Schwandt (2001) described methodology as the theory of how inquiry should proceed and that it involves analysis of assumptions, principles, and procedures in a particular approach of inquiry. Lather (1991) argued that methodology of the positivism paradigm is scientific method. This may include case study approach and experimental and control group experiments in which researchers describe the context in detail and remodel questions for field use (Creswell, Clark, Gutmann & Hanson, 2003). Somekh and Lewin (2005) defined methodology, as both the collection of methods or rules by which a particular piece of research is undertaken, and the principles, theories and values that underpin a particular approach to research. Research methodology is a term which applies to how research is conducted and is based on our assumptions, interests, and purposes shape which methodology to choose (Steven, Bogdan & Devault, 2015).

The research questions posed in the research can be both descriptive and explanatory in nature, therefore the research can have more than one purpose (Neuman, 2006;Saunders, Lewis &Thornhill, 2009).The current study is descriptive, describing a phenomenon as it exists, and analytical to explain why or how something is happening as far as the uptake and use of ICT as part of e-governance in improving service delivery in local authorities is concerned.

4.3 Research reasoning

Deductive and inductive approaches are strategies, which can be used in scientific inquiry when testing a theory or building a theory. Deductive begins with proposing hypotheses, proceeds into analyzing data, and finally concludes with confirmatory tests (Yom, 2015).On the other hand, inductive research, begins with the specific observation of the empirical

world and develops theories or hypothesis based on the evidence collected from their observations (Neuman, 2014).This research therefore, uses deductive and inductive thinking in a distinctive sequence to address the objectives of the study and to come up with e-governance framework that improves service delivery in local authorities in South Africa.

4.4 Research paradigm (philosophy)

Quantitative research attempts to uncover reality and this reasoning forms the philosophical assumption surround the research topic of a framework of e-governance to improve service delivery by local authorities in South Africa.Morgan (2014) indicated that it is essential to recognize that paradigms are more than simple statements about future directions for research. Neuman (2014) explained that a paradigm is a whole system of thinking,which includes basic assumptions, the research question to be addressed, and the research technique to be used.

Research philosophies can take the form of positivism, realism, interpretivism, phenomenological and pragmatism (Saunders, et al., 2009), but the positivist and interpretivist paradigms are used most frequently.

4.4.1 Positivism

Positivism is as a family of philosophies characterized by an extremely positive evaluation of science and scientific method (Lincoln & Guba, 2000). The positivist researchers applied an organised method for combining deductive logic with precise empirical observations for individual behaviour in order to discover and confirm a set of probabilistic causal laws that that can be used to predict general patterns of human activity (Neuman, 2014).Schwandt (2001) further stressed that positivism is based on strict empiricism propounded that experience is the sole basis for generating knowledge. In agreement with Merriam (2002) mentioned knowledge is logically bounded by general laws and is observable.

4.4.2 Realism

Quantitative research worldview believes on single measurable, observable, and provable truth (Merriam, 2002). Merriam (2002) further pointed out that quantitative researchers attempt to uncover this reality. This reasoning therefore forms the philosophical assumption surround the research topic of a framework of e-governance to improve service delivery by local authorities in South Africa.

4.4.2 Interpretive

Interpretive paradigm assumes that social reality is the result of the subjective interpretations of individuals (Ardalan, 2018). Ardalan (2018) highlighted that interpretive paradigm sees the social world as a process that is created by individuals. Social reality, insofar as it exists outside the consciousness of any individual, is regarded as being a network of assumptions and inter subjectively shared meanings (Ardalan, 2018).Greener (2008) argued that an interpretive paradigm uses a qualitative research method such as discourse analysis, unstructured interviews to investigate perceptions and constructions of reality by “actors” in organisations that is employees, managers, stakeholders etc.

4.4.4 Phenomenological

Moon and Blackman (2014) believed that researchers can put their own systems of meaning (of reality) aside and interpret the immediate personal experience of a phenomenon and thus give rise to a new, refreshed, or richer meaning of the phenomenon. The essence of human experience of phenomena is only understood when the researcher separates their experiences (Moon & Blackman, 2014).

4.4.3 Pragmatism

Pragmatism can be used as a guide, not only for top-down deductive research design, but also for grounded inductive or abductive research (Morgan, 2007). It offers the chance to produce a ‘‘properly integrated methodology for the social sciences’’ (Morgan, 2007) in acknowledging the value of both quantitative and qualitative research methods and the knowledge produced by such research in furthering this study understanding of society and social life as far as the uptake and usage of ICT as part of e-governance by citizens in improving service delivery. Pragmatism may thus enable this study to enjoy the complexity and messiness of social life and revive a flagging sociological imagination (Morgan, 2007). Pragmatism is a philosophical movement that considers beliefs and theory as being linked to our practical engagement in the world rather than to the world as it truly is (Allen & Clough, 2015; Maul & McGrane, 2017). Morgan (2014) argued that from the perspective of pragmatism, new paradigms create new sets of beliefs that guide new kinds of actions. At a fundamental level, paradigms create new worldviews and social contexts that have widespread impacts on the conduct of inquiry (Morgan, 2014). The pragmatic paradigm prevents research from spending time in pointless debates about such concepts as truth and

reality and thus enabling this research to address the research questions (Tashakkori & Teddlie, 1998). The current research study aims to achieve the pragmatic paradigm.

4.5 Research approach

There are three research approaches namely;

- Quantitative approach,
- Qualitative approach, and
- Mixed methods.

To identify an appropriate methodology, this research considered the purpose of the research (Neuman, 2014).The research questions, which the research has posed, are both descriptive and explanatory; therefore the research direction is a mixed method approach.

4.5.1 Quantitative approach

Quantitative research can be defined as research that explains phenomena according to numerical data which are analysed by means of mathematically based methods, especially statistics (Yilmaz, 2013). From a broader perspective, it can be defined as a type of empirical research into a social phenomenon or human problem, testing a theory consisting of variables which are measured with numbers and analysed with statistics in order to determine if the theory explains or predicts phenomena of interest (Gay & Airasian, 2000). Gay and Airasian (2000) argued that research in the twentieth century, especially in the first half of the century, was dominated by the quantitative method. Its philosophical basis of positivism can be said to have been substituted by critical realism in the last half of the century (Cook & Campbell, 1979). Cook and Campbell (1979) defended that qualitative approach was developed partly as a protest against the dominance of the quantitative tradition, and it attained its definitive breakthrough around 1970. Gay and Airasian (2000) argued that quantitative research also focuses on proving or disproving a hypothesis based on a large number of participants' responses and the idea is also to generalize on larger population by conducting analysis using sophisticated statistical tools. Kothari (2004) distinguished that quantitative approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This study did not therefore use this method alone, but blended it with qualitative approach in order to fully understand and answer the research questions posed in Chapter 1.

The advantage of the quantitative approach is that data from large numbers of people lead to greater breadth of understanding, as opposed to the depth of understanding possible from qualitative methods (Francisco, Butterfoss & Capwell, 2001). Francisco, et al. (2001) argued that strong inferences are possible with the quantitative method, especially when tight experimental control is achieved. Quantitative methods are often more systematic than other methods, which makes findings more likely to be replicated (Francisco, et al., 2001). On the other hand, Francisco, et al. (2001) highlighted that the disadvantage of the quantitative approach is that one can only prove what one already believes, that is to confirm the hypothesis about current variables and the range or scope of knowledge may not extend to new variables related to the intervention. With the quantitative method, one cannot demonstrate the meaning of findings to people's lives (Francisco, et al., 2001). However, for the purpose of this research these limitations were overshadowed by the strengths of the quantitative method and qualitative methods through the use of the mixed method.

4.5.2 Qualitative approach

Kothari (2004) explained that the qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour. Kothari (2004) indicated that research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis (Kothari, 2004). Kothari (2004) explained that qualitative approach attempts to understand and make sense of phenomena from the participant's perceptive. The researcher can approach the phenomenon from an interactive, critical, or postmodern stance (Merriam, 2002). Merriam (2002) concluded that all quantitative research is characterised by the search for meaning and understanding, the researcher as the primary instrument of data collection and analysis, an inductive investigative strategy, and a richly descriptive end product. This study therefore did not use this approach in isolation, but used it under the umbrella of the mixed approach.

Figure 4-1 illustrates the weaknesses and strengths of qualitative and quantitative research methodology. Choosing either one type of research methodology has still embraced negative and positive impacts of the results and output (Choy, 2014) in a bid to answer the research questions; why is there a low uptake and usage of Information Communication Technology by citizens at a local government level in South Africa? And why are local authorities offering poor service delivery to their citizens in South Africa? Thus, it could be concluded that there is no perfect between qualitative and quantitative research methodologies (Choy, 2014). Therefore, the advantages and disadvantages of both types of

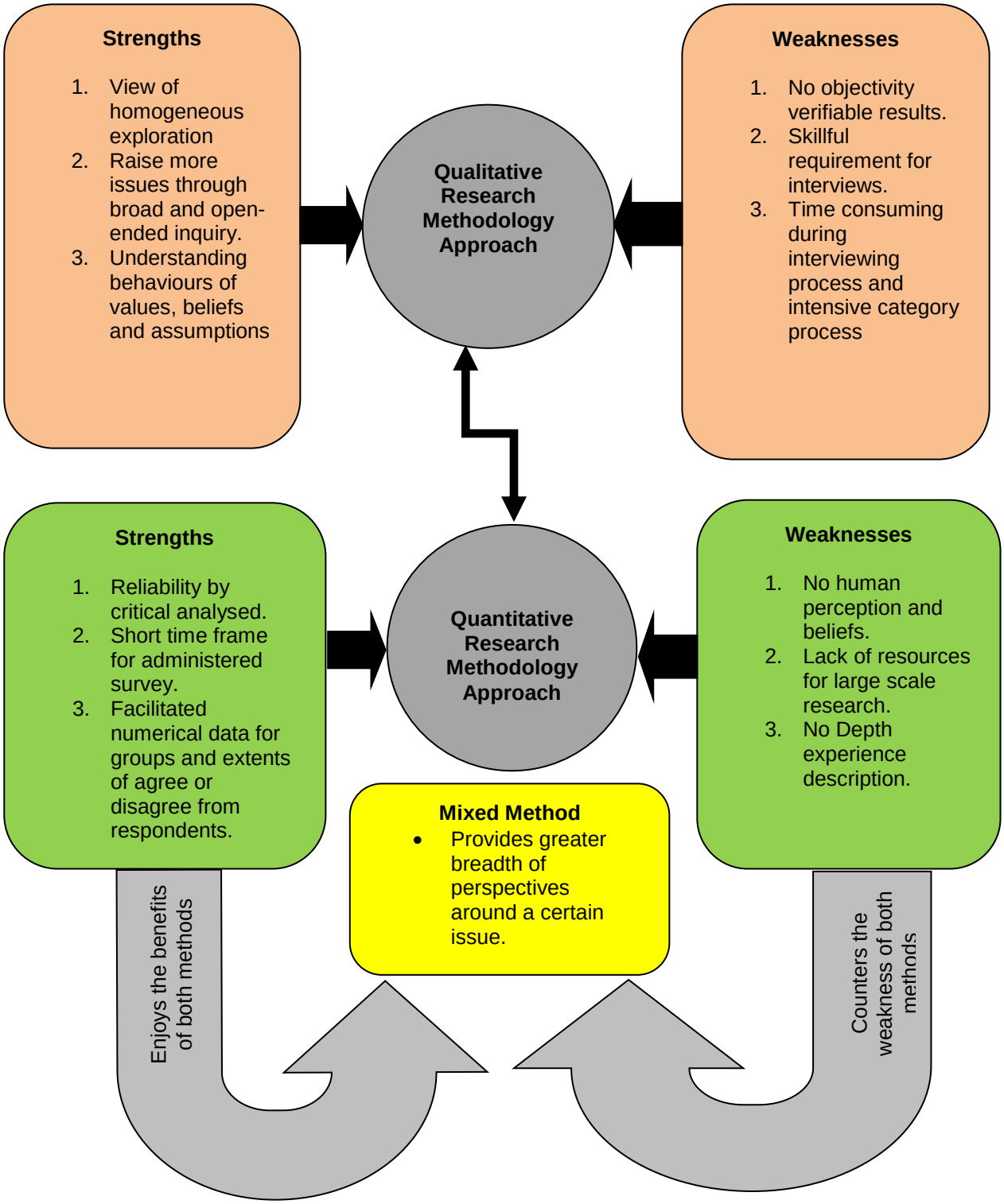

Figure 4-1: Strength and weaknesses of quantitative and qualitative research approach.

research methodologies has been counterbalanced by using a mixed method approach in order to achieve greater breath of perspective around the research topic.

The complementary relationship between both qualitative and quantitative research methodologies could provide better solutions for this research by using a mixed method. Choy (2014) argued that a comparison and complimentary results as references from both separated processes on qualitative and quantitative approaches through mixed method approach in a same research topic may reduce or perhaps eliminate those limitations and bias. This is the alternative way to provide better solution in research methodologies in order to come up with framework for e-governance which improves service delivery for local authorities in South Africa.

4.5.3 Mixed method approach

The mixed method approach represents the blending of quantitative and qualitative methods in research, and it can be said to have been evolved historically from the notion of "triangulating" information from different data sources (Patton, 1990). The mixed method approach can be considered established as a formal discipline around 2000 (Lund, 2012). This method is characterized by a practical/pragmatic attitude in that the research questions in empirical studies are given high priority, not philosophy of science, and in that qualitative and quantitative methods are used in combination for answering such questions (Lund, 2012).

To identify an appropriate methodology, this research considered the purpose of the research (Neuman, 2014). The research questions which the research has posed are both descriptive and explanatory in nature therefore the research direction for this study is mixed method.

4.5.3.1 Motivation for using mixed method approach

The use of the mixed method in this research was triggered by the motive to improve the quality of the research by counterbalancing or compensating for the biases, limitations and disadvantages of a one approach method, by mixing it with a method belonging to the other approach (Fidel, 2008). This study applied a mixed approach in data collection through the use of self-administered questionnaires and interviews, data analysis and interpretation of the findings. In order to draw up strengths and perspectives of each method, (Johnson & Onwuegbuzie, 2004) recognized the existence and importance of the physical, natural world, as well as the importance of reality and influence of human experience as far as the use of

ICT tools as part of e-governance in improving service delivery in local authorities is concerned. A mixed method approach is used for this research for the purposes of triangulation, sought convergence and divergence across qualitative and quantitative approaches (Greene, et al., 1989). This study triangulated data collection methods by using interviews and self-administered questionnaires. The study also triangulated models or theories of e-governance models. Triangulation of data sources which include data from citizenry of Municipalities and Executives members from Gauteng Province was done.

4.6 Research design

The research design is how the researcher intends to carry out the work (Saunders, Lewis & Thornhill, 2007). Creswell and Plano Clark (2007) described research design as procedures for collecting, analyzing, interpreting and reporting data in research studies. Saunders, et al. (2007) argued that decisions on research design are based on the research purpose, and on what best match the research problem. The research carried out for this study is descriptive and explanatory in nature. Yin (2003) explained that the descriptive research design can be applied when the problem is clearly structured Pickard (2007) claimed that quantitative and qualitative methods can be applied in descriptive and explanatory research. This research therefore followed a mixed-methods research approach in order to utilise the advantages of both quantitative and qualitative approaches. Patton (1990) support that mixed methods research is characterized as the research that contains elements of both qualitative and quantitative approaches.

4.6.1 Mixed-method design

Mixed methods research is a methodology that meaningfully integrates both quantitative and qualitative approaches and the combination of the strengths of each to answer research questions (Valentine, 2016). The glossary of Creswell and Plano Clark's (2007) handbook defines mixed methods as "the collection and analysis of both qualitative and quantitative data, mixing the two forms of data, giving priority to one or both, using procedures in a single study or multiple phases of a program of study, framing these procedures within a philosophical worldview or theoretical lenses, and combining procedures into specific research designs that direct the plan for conducting the study".

4.6.1.1 Types of mixed-method design

There are different types of combined designs, which are based on sequence of and different emphasis on, using different techniques (McMurray, et al., 2004). These include: two phases or sequential design versus simultaneous or concurrent design:

- Two phases or sequential design includes the use of methods sequentially, in separate stages of the study (McMurray, et al. 2004).
- Concurrent or simultaneous design occurs when the researcher uses the two methods in parallel, or simultaneously (McMurray, et al., 2004).

McMurray, et al. (2004) argued that there is dominant/less dominant and equivalent status design. McMurray, et al. (2004) indicated that with dominant/less dominant design, it involves more focus on one technique as a primary approach. However, in equivalent status design, the weight of emphasis on different methods is almost equal (McMurray, et al., 2004).

The equal status design is used in this research in order to understand and explain the uptake and usage of ICT by citizens in improving service delivery. This design was carried out in two phases or sequentially:

(1) an initial quantitative instrument phase using self-administered questionnaire for citizens from the municipalities, followed by

(2) a qualitative data collection phase using interviews for executive members from identified municipalities.

The qualitative phase builds directly on the results from the quantitative phase. In this way, the quantitative results for the study are explained in more detail through the qualitative data in which data was collected and analysed in a particular sequence with the purpose of informing, integrated with, or finding from, the other method (Wisdom, 2013). Qualitative data was embedded within equal status quantitative approach. Both quantitative and qualitative data analysed was kept separate, and was then combined or integrated into meta-inferences (Creswell & Plano Clark, 2007). Both data sets were used for descriptive and explanatory purposes.

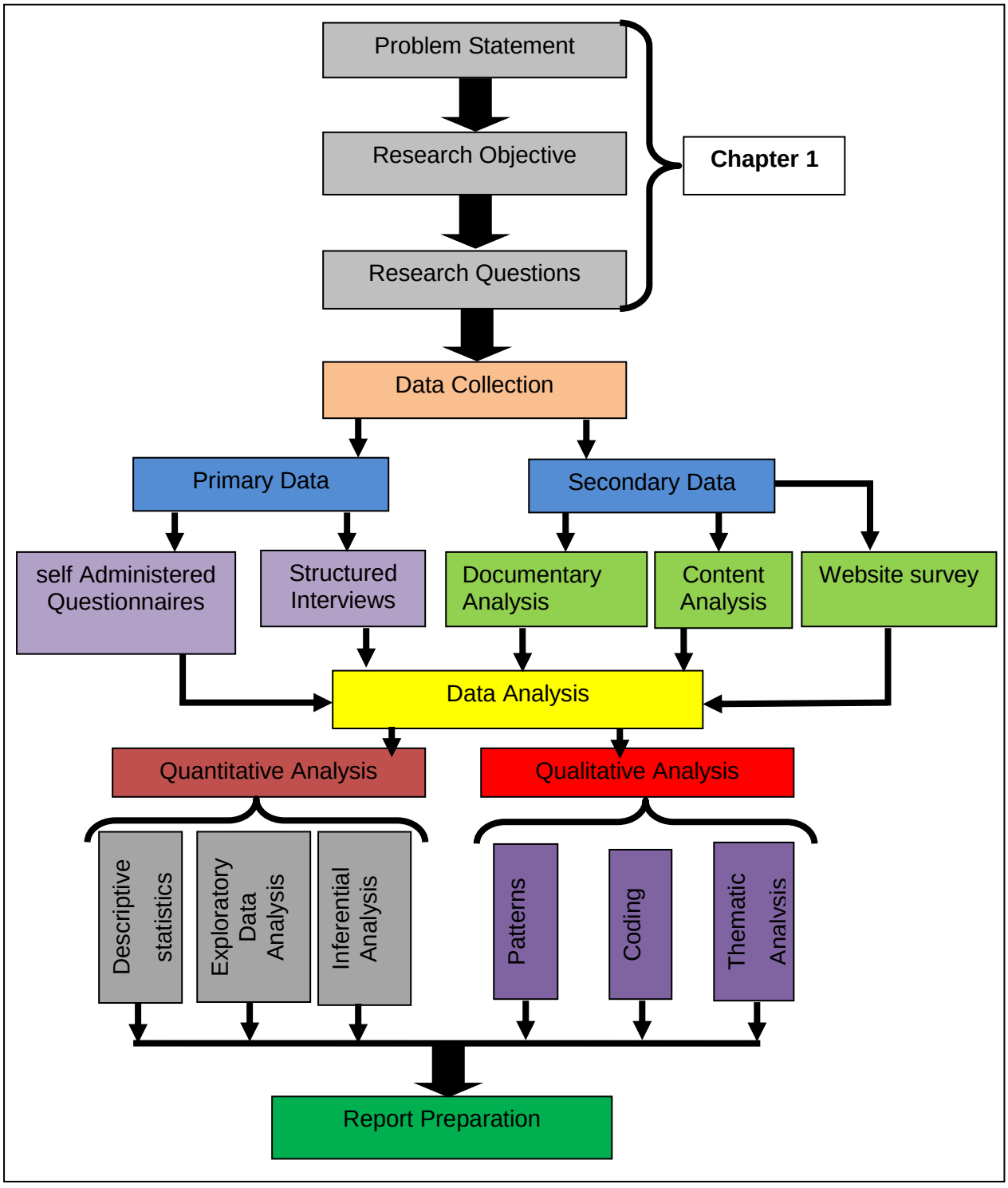

Figure 4-2: An overview of research design and its components.

4.7 Research process

Figure 4-2 illustrates the overview research design flow and their components which show the mixed method characteristics, which has been used in this study.

4.8 Research strategy

There are various research strategies which can be used namely; experiment, survey, case study, action research, grounded theory, ethnography and archival research.For the purpose of this study, this research used survey and case studies.

4.8.1 Survey

Survey research uses a written questionnaire or formal interview to gather information on the background, behaviours, beliefs, or attitudes of a large number of people (Neuman, 2014). A survey is an investigation in which information is systematically collected. Surveys are carried out by investigators wishing to collect descriptive information about a group of people, often referred to as the target population (Portney & Watkins, 1993). Portney and Watkins (1993) indicated that the survey strategy is usually associated with the deductive approach and it is a popular and common strategy in business and management research and is most frequently used to answer who, what, where, how much and how many questions. It therefore tends to be used for exploratory and descriptive research (Portney & Watkins, 1993).

Langbecker, Caffery, Gillespie and Smith (2017) highlighted that the popularity of the survey as a method of measurement can be understood through three major strengths of this technique. Langbecker, et al. (2017) listed that the first strengthis that confidential survey questions are well suited to capture individuals' experiences, perceptions and attitudes (Langbecker, et al., 2017). Langbecker, et al.(2017) gave the second strength as pre-existing scales can be used across studies, enabling the comparison and replication of results. As surveys allow data to be collected from large samples for relatively low cost, they can produce generalizable results, which provide an understanding of the views or experiences of a population group (Langbecker, et al., 2017). Langbecker, et al. (2017) gave the third strength as the validity and reliability of survey instruments can be assessed through rigorous, transparent and well-accepted validation methods, providing the researcher with confidence that the measures tap the intended constructs, and provide an accurate measurement.

This study used questionnaires administered to a sample, which was extracted from the population of the selected municipalities. Portney and Watkins (1993) explained that the survey strategy allows you to collect quantitative data which you can analyse quantitatively using descriptive and inferential statistics.

Survey takes two broad forms, the census and the sample survey and that in a sample survey, a representative sample of the target population, often referred to as the study population or study sample, is selected and questioned (Finlayson, et al., 1999). Data from sample surveys provide descriptions of a population in the same way a census would, but the researchers can be less confident that data is representative of the "true" population (Finlayson, et al., 1999).This research used the sample survey for home owners to get direction on research questions on the uptake and usage of ICTs by citizens.

4.8.2 Case study

Robson (2002) defined case study as "a strategy for doing research, which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence". Saunders, et al. (2009) argued that that case study also differs from the survey strategy where, although the research is undertaken in context, the ability to explore and understand this context is limited by the number of variables for which data can be collected.

The case study strategy was of particular interest for this study in order to gain a rich understanding of the context of the research and the processes being enacted (Morris & Wood, 1991). Saunders, et al. (2009) explained that the case study strategy also has considerable ability to generate answers to the question 'why?' as well as the 'what?' and 'how?' questions, although 'what?' and 'how?' questions tend to be more the concern of the survey strategy. For this reason the case study strategy is most often used in explanatory and exploratory research. Saunders, et al. (2009) expressed that the data collection techniques employed may be various and are likely to be used in combination. This study therefore include interviews, documentary analysis and questionnaires. Consequently, case study strategy is used in this study to triangulate multiple sources of data. Triangulation refers to the use of different data collection techniques within one study in order to ensure that the data are telling the study what the study think they are telling the study (Saunders, et al, 2009).

Saunders, et al (2009) highlighted that a case study strategy can also incorporate multiple cases, that is, more than one case. The rationale for using multiple cases focuses upon the need to establish whether the findings of the first case occur in other cases and, as a consequence, the need to generalise from these findings (Saunders, et al., 2009). For this reason Yin (2003) argues that multiple case studies may be preferable to a single case study and that, where the study chooses to use a single case study, the study will need to have a

strong justification for this choice. This study however uses a multiple case study. of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality to understand phenomenon within its real life context of e-governance in these municipalities.

4.9 Reasons for using mixed method design

The reasons for using mixed method design in understanding e-governance in a bid to improve service delivery in South African local authorities are summarised in Table 4-1.

Table 4-1: Reasons for using mixed design.

Reason	Explanation
Triangulation	Use of two or more independent sources of data or data collection methods to corroborate research findings within a study.
Facilitation	Use of one data collection method or research strategy to aid research using another data collection method or research strategy within a study (e.g. qualitative/quantitative providing hypotheses, aiding measurement, quantitative/qualitative participant or case selection).
Complementarity	Use of two or more research strategies in order that different aspects of an investigation can be dovetailed (e.g. qualitative plus quantitative questionnaire to fill in gaps quantitative plus qualitative questionnaire for issues, interview for meaning).
Generality	Use of independent source of data to contextualise main study or use quantitative analysis to provide sense of relative importance (e.g. qualitative plus quantitative to set case in broader context; qualitative × quantitative analysis is to provide sense of relative importance).
Aid interpretation	Use of qualitative data to help explain relationships between quantitative variables (e.g. quantitative/qualitative).
Study different aspects	Quantitative to look at macro aspects and qualitative to look at micro aspects.
Solving a puzzle	Use of an alternative data collection method when the initial method reveals unexplainable results or insufficient data.

Source: developed from (Bryman, 2011).

4.10 Population

The full set of cases from which a sample is taken is called the population (Saunders, et al., 2009).This research focuses on two sets of population, namely, the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi Local municipality, Randfontein Local municipality and Westonaria Local municipality citizenry and the Executives from those municipalities who are in charge of driving the municipalities strategic plans. Table 4-2 shows the population from each district municipality and the envisaged sample size.

Table 4-2: Population size by district municipalities and sample size

District Municipal	Population	Sample size
Sedibeng	916 484	382
West Rand	820 995	382
Ekurhuleni	3 178 470	384
City of Johannesburg	4 434 827	384
City of Tshwane	2 921 488	384
Gauteng	9 388 854	1916

Source: Statistics South Africa (2011).

4.11 Sampling

Blanche and Durrheim (2002) highlighted that sampling is the process used to select cases for inclusion in a research study. All empirical research is conducted on sample cases, which may be individuals, groups, organizations or archival documents (Blanche & Durrheim, 2002). Blanche and Durrheim (2002) further explained that sampling is a very important aspect of research because the types of conclusions that can be drawn from the research depend directly upon whom the research was conducted.

The reason for selecting this province for the study is because Gauteng Province is considered the economic hub of South Africa and is often the first choice of destination by job seekers across the country (Statistics South Africa, 2011) While being the smallest province, it is also most populous, being 12 272 263 people (Local Government, 2016). It is a province with a unique, African character, world-class infrastructure in the fields of telecommunications, transportation, water and power, and with globally-competitive health care and educational facilities (Statistics South Africa, 2011). However, the province is also one of contrasts – home to both wealthy and poor, residents and refugees, global corporations and emerging enterprises (Statistics South Africa, 2011).

The population for this study is from Gauteng Province, which is divided into three metropolitan municipalities namely; the City of Ekurhuleni, the City of Johannesburg and the City of Tshwane. There are also the two district municipalities, namely Sedibeng and West Rand. These districts are further subdivided into seven local municipalities. Table 4-2 illustrates the population size and the sample size. The researcher ensured that the sample is collected in a systematic manner, so that the impact of the sample members on the results can be estimated and evaluated.

4.11.1 Sampling procedure

The sampling techniques available can be divided into two types:

- probability or representative sampling;
- non-probability or judgemental sampling.

Saunders, et al. (2009) argued that with probability samples the chance of each case being selected from the population is known and is usually equal for all case. This means that it is possible to answer research questions and to achieve objectives that require the study to estimate statistically the characteristics of the population from the sample (Saunders, et al., 2009). Saunders, et al. (2009) emphasised that probability sampling (or representative sampling) is most commonly associated with survey-based research strategies where the study need to make inferences from a study sample about a population to answer research question(s) or to meet research objectives. Consequently, probability sampling is often associated with survey and experimental research strategies, therefore this study used survey to collect the required data using self-administered questionnaires form citizens from the selected municipalities (Saunders, et al., 2009). Saunders, et al (2009) further explained that for non-probability samples, the probability of each case being selected from the total population is not known and it is impossible to answer research questions or to address objectives that require the study to make statistical inferences about the characteristics of the population. The study may still be able to generalise from non-probability samples about the population, but not on statistical grounds (Saunders, et al., 2009). However, with both types of samples can provide answers to the research questions highlighted in Chapter 1. Figure 4-3 shows different sampling techniques.

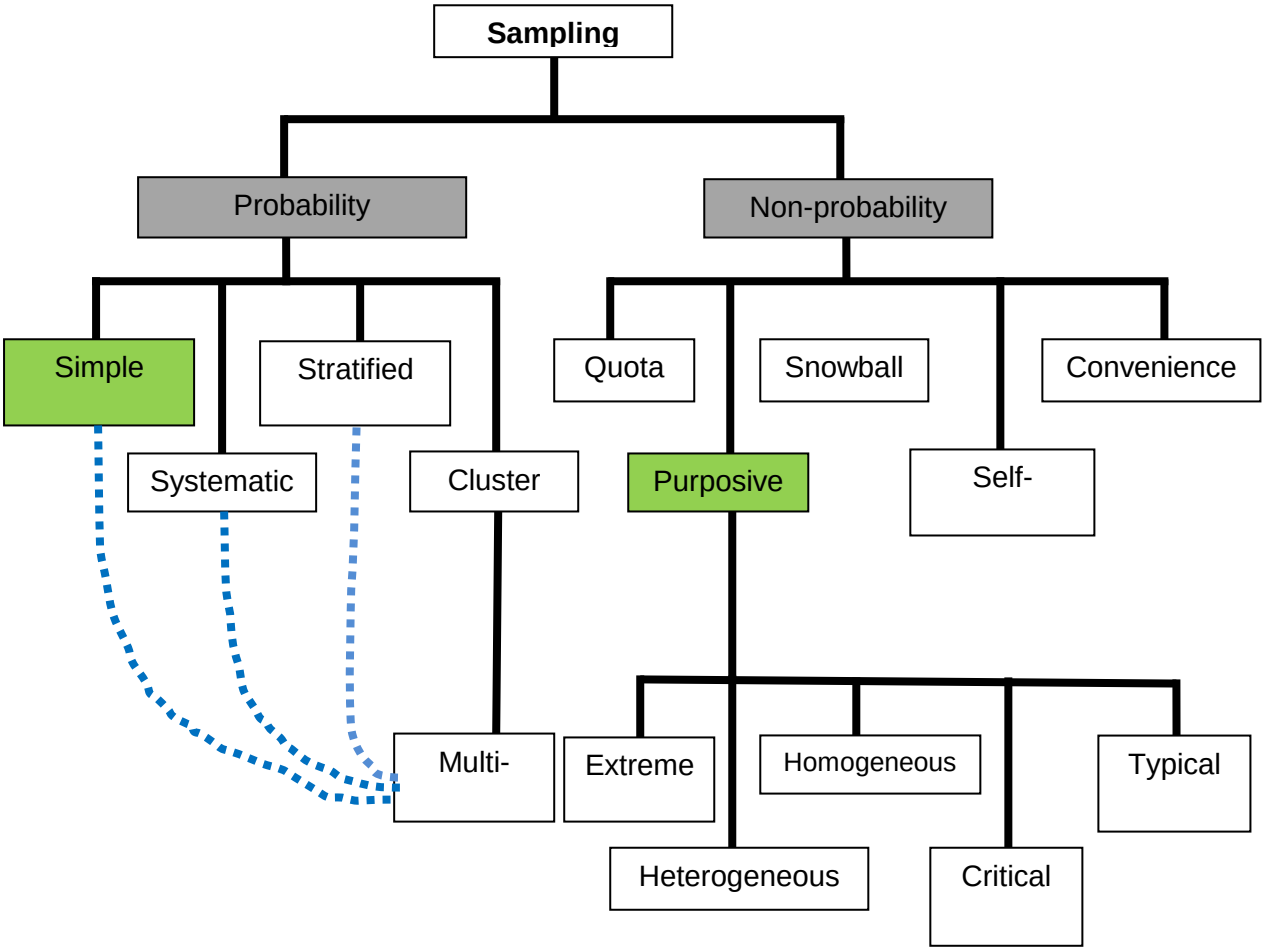

Figure 4-3: Sampling techniques. Source: Saunders, Lewis and Thornhill (2009).

Purposive or non-probability sampling is common in mixed methods studies and occurs when the researcher applies some criterion or purpose to replace the principle of cancelled random errors(Kemper, et al., 2003). Patton (1990) explained that the logic and power of purposive sampling lies in selecting information-rich cases for in-depth study.

(1) A non-probabilistic, purposive sampling approach was used to interview executive members of the City of Ekurhuleni, the City of Johannesburg, the City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality who are responsible for driving the strategic plans for these municipalities.

(2) The study distributed self-administered questionnaires to citizenry of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality.

The study also used probabilistic, simple random sampling for selecting participants, not only does each element of the sampling frame have a known probability of being selected, but they each have the same probability of selection (Blanche & Durrheim, 2002). In probability sampling, every element in the target population must have a known chance of being selected into the sample. Probability samples ensure that the researcher has no say in the choice of the respondents. This means the study cannot bias the selection process, and consequently the results of the study.

4.11.2 Sampling frame

Sampling frame as a list of all elements in population (Johnson & Christensen, 2008). On the other hand Saunders, et al. (2009) argued that the sampling frame for any probability sample is a complete list of all the cases in the population from which your sample will be drawn.

The study involved residents under the jurisdiction of three Metropolitans, namely; City of Ekurhuleni, City of Johannesburg and City of Tshwane and three local municipalities from two Districts, namely Lesedi local municipality, Randfontein local municipality and Westonaria local municipality.

4.11.3 Sample size

Deciding on an appropriate sample size to be drawn from a population of interest is an essential aspect of planning a research study (Hayat, 2013). Consideration should be given to the size of a realistic sample as well as to the benefits and risks associated with more or fewer participants (Hayat, 2013). Ngulube (2005) argued that there are other factors, which determine a sample size (Ngulube, 2005) for example, purpose of the study, population size, practical constraints and time frame (Lenth, 2001).

The sample of this research is divided into categories of respondents, namely citizenry from City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality and the Executive members from these metropolitans and local municipalities.

Since the research used Factor Analysis and T-test, the sample choice is dependent on multivariate analysis conditions. One of the important condition of the analysis is that it needs a sample whose size should be 100 or larger (Malhotra, 2006).This applies to citizenry category of respondents who completed self-administered questionnaires. Sample size for the executive members of the City of Ekurhuleni, City of Johannesburg, City of

Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality was purposively selected because they possess the information regarding the policies and strategies for these municipalities.

4.12 Data collection

Creswell and Poth(2018) highlighted that data collection involves much more than just collecting the data. It means anticipating ethical issues involved in gaining permissions, conducting a good mixed sampling strategy, developing means of recording and collecting information, responding to issues as they arise in the field and storing the data securely (Creswell & Poth, 2018) A number of different methods are used to collect data. The techniques that are used for getting the required information from the sample include personal interviews, telephone interviews, questionnaires, diaries and meters (Blanche & Durrheim, 2002). Other data collection techniques such as observation and documentary analysis are also worth mentioning. The current study therefore applied several data collection method as used under the assumption that disadvantages posed in one method was counterbalanced via advantages in another. The research used self-administered questionnaires, structured interviews and documentary analysis in collecting data for both quantitative and qualitative methodologies Authorisation letter to collect data from municipalities is on Annexure D.

4.12.1 Primary data

Primary data is that which is derived from first-hand sources and this can be historical first-hand sources, or the data derived from the respondents in survey or interview data (Bryman, 2011). For example, data derived from statistical collections such as the census can constitute primary data and likewise, data that is derived from other researchers may also be used as primary data, or it may be represented by a text being analysed (Flick, 2011).

4.12.1.1 Interviews

An interview is considered to be a social interaction based on a conversation (Creswell & Poth, 2018). Creswell and Poth (2018) explained further that an interview is where knowledge is constructed in an interaction between the interviewer and the interviewee. There are three kinds of interviews, namely: unstructured, structured, and semi-structured. Face-to-face interview was the original way of gathering survey information, and is still extensively used today. This is one of the instruments the study used to gather data.The research used structured interviews to collect data from top level managers of the City of

Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. The study developed 15 interview questions. Annexure B shows interview protocols for Executive Managers. Face-to face interviews have the highest response rate and permit the longest and most complex questionnaires. The researcher controlled the sequence of questions and can use some probes. In order to solve the challenge of response bias the research interviewed as many top level managers as possible and asked the same questions in different ways until the study gets to a point of saturation. Reliability, validity and practicability of the research instruments were guaranteed by pre-testing the interview guide.

4.12.1.2 Questionnaire

A questionnaire was adopted as the appropriate data collection tool for the quantitative research in this study. The questionnaire was constructed to include the dependent variables as inferred from the secondary research and as specified in the research objectives of this study. This research used a quantitative self-administered questionnaire which is based on completely structured items with closed ended questions for different sections. These sections sought some answers on perceptions, attitudes and opinions on the uptake and use of ICT in improving service delivery in local authorities. Self-administered questionnaire was distributed to the selected respondents from identified sample from the population of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. Annexure A provides the English version of the questionnaire.

A questionnaire is a self-report data collection instrument that each research participant fills in as part of a research study (Johnson & Christensen, 2008).Three methods may be used to collect data in surveys, namely a mail (self-administered) questionnaire, a personal face-to-face interview and a telephone interview (Malhotra, 2004; Babbie & Mouton, 2003).

Self-administered questionnaires specifically offer two primary advantages. Firstly, self-administered questionnaires can be distributed to a large number of respondents in a short time, and secondly, self-administered questionnaires allow for anonymity, which increases the probability of honest responses (Mitchell & Jolley, 2013).The advantage of administering the questionnaire is that it would be more effective and efficient as the respondents are spread across the province (Curwin & Slater, 2004). Onwuegbuzie and Leech (2006) highlighted thatself-administered questionnaires are cheap and easy to administer, preserve confidentiality, can be completed at respondent's convenience and can be administered in a

standard manner (Onwuegbuzie & Leech, 2006). Onwuegbuzie and Leech (2006) argued that the questionnaire can be designed on a Likert scale to enhance validity and reliability (Onwuegbuzie & Leech, 2006). The study specifically chose the Likert scale as it is applied when performing seductive-based research of quantitative in nature (Onwuegbuzie & Leech, 2006). The current research study applied the Likert scale to the constructs of e-governance and service delivery model and how it improves service delivery. A draft questionnaire was developed using input from literature and the research questions. This questionnaire draft was pre-tested, modified and administered using convenience sampling in order to increase the reliability and validity of the findings.

4.12.2 Secondary data

The study made an analysis of Integrated Development Plans (IDP), minutes of meetings, strategic plan documents and the Statutory Acts of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality which governs the operation of municipalities in understanding the role they should play in delivering services to the citizens.Secondary data is that which is derived from the work or opinion of other researchers (Newman, 1998). Newman (1998) gave an example that conclusions of a research article can constitute secondary data because it is information that has already been processed by another. Kothari (2004) added that analysis conducted on statistical surveys can constitute secondary data. Newspapers may prove both a primary and secondary source for data, depending on whether the reporter was actually present (Kothari, 2004).

4.13 Data analysis

Questionnaire and interview data which was gathered was analysed by applying quantitative and qualitative methodology respectively. This research adopted sequential explanatory strategy as discussed by Cresswell (1998) that qualitative results can be of paramount important to give some insight and interpret the findings emanating from quantitative study. During this stage of the research process, data collected are converted into a format that can be used to inform the research problem.

4.13.1 Quantitative analysis

When data are processed, they need to be prepared and then analysed (Serfontein, 2010). Data preparation was done by extracting data from questionnaires so that these can be read and manipulated by computer software using SPSS. In this study numerical responses were

entered into an electronic spreadsheet file for respondents who answered the questions on the questionnaire. For the purposes of this research, a combination of both charts and tables are used in producing the descriptive statistics, which relate to the demographic profile of the participants. Variables for this research are illustrated in Figure 3-8 in Chapter 3. The Factor Analysis focused on five factors, namely Internet usage and connectivity, municipality services, service delivery output, impact of e-governance and e-governance outcome.

4.13.1.1 Descriptive statistics

Descriptive statistics are statistics that are used to describe the characteristics of the sample taken or in other words profile the sample taken (Gerber & Hall, 2013). Gerber and Hall (2013) argued that no inferences can be drawn from this kind of statistical analysis, mere profile of the data collected. Frequencies, means and standard deviations are normally produced with these nominal biographical variables being depicted with pie/bar charts or tables (Gerber & Hall, 2013). For the purposes of this research, tables are used in producing the descriptive statistics, which relate to the demographic profile of the participants.

4.13.1.2 Exploratory Data Analysis (EDA)

Once data have been entered and checked for errors, the analysis of the study is ready to start. Tukey's (1977) exploratory data analysis (EDA) approach is useful in these initial stages. This approach emphasises the use of diagrams to explore and understand the collected data, emphasising the importance of using the data to guide the choices of analysis techniques. As this study would expect, the researcher believed that it is important to keep the research questions and objectives in mind when exploring the data.

After carrying out descriptive analysis on demographic profile, the study continued to carry out EDA by using Factor Analysis. The Factor Analysis focused on five factors, namely Internet usage and connectivity, municipality services, service delivery output, impact of e-governance and e-governance outcome. EDA can also help to check for violations of the assumptions that underpin specific statistical analysis (Howell, 1997). This type of analysis set tone for this research as it assisted in identify key variables which concern issues of e-governance and service delivery in local authorities.

4.13.1.3 Inferential statistics

After carrying out factor analysis, the researcher did inferential statistics by making use of T-test using Analysis of variance (ANOVA). Inferential statistics as the method of assessing

the significance of the data and the results obtained (Blaxter, Hughes &Tight, 2003). Through inferential statistics, the next step from descriptive statistics analysis was undertaken and established statistical tools to analyse the data and interpret the results was applied. By applying this method, conclusions can be made. Cronbach Alpha Coefficient was therefore used to test the reliability of the factors identified.

4.13.2 Qualitative analysis

This study collected data from individual executive members of municipalities and managed to collect volume of data in natural conversation settings. Interviews recorded from executive members of municipalities were transcribed. In this analysis, five primary documents, namely P1, P2, P3 and P5, from the field were considered. In this study, the researcher used an electronic data analysis tool called Atlas.Ti 7.2. This study used Atlas.Ti to captures categories of incidents and properties of these categories as codes and quotations respectively and quotations are synonymous with incidents and codes or categories are groups of incidents whose choice was informed by the theoretical sensitivity of the researcher. In this study, the collected data was open coded and analyzed.

A qualitative data analysis tool can accept textual, graphical, audio or video materials as input to be interpreted (Mavetera, 2011). All the analysis work from the municipalities under study was done and was contained in a container called a Hermeneutic Unit. Mavetera (2011) indicated that the input documents are referred to as Primary Documents (PD).

Qualitative methods, however, are interpretive and reflexive, and they generate subjective data based on the perspectives of the interviewees (Mason, 1996). Cresswell (1998) argued that the methodological focus of qualitative research is to draw out reports of lived experiences through a variety of means, including in-depth interviewing or taped recordings of conversations between individuals or groups.

4.13.3 Content Analysis

Since this research is based on ICT tools for e-governance in improving service delivery, the study used an additional data analysis of content analysis which has been defined by Neuendorf (2001) as the systematic, objective, quantitative analysis of message characteristics. Content analysis comprised the existing definitions of content analysis into a description of the method as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Stemler, 2001). As a

tool, content analysis has been used to analyse trends and patterns in the documents, videos, and websites (Parylo, 2012)

Although the content can be described as words, images, videos, tools, or services, this study focused on the websites content of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. A content inventory of websites domain, of the municipalities' vision, mission, objectives, strategy, electronic services, other non-electronic services and websites hits by customers was created and was revisited throughout the analysis.

4.14 Assessing and demonstrating the quality and rigour of the research design

Quality of research design can be measured using validity and reliability. Validity is defined as the appropriateness, meaningfulness, and usefulness of the specific inferences made from the measures (Dooley, 2001). Reliability is the degree to which observed scores are free from errors of measurement (Dooley, 2001).

According to Yin (2002), case study researchers need to guarantee construct validity (through the triangulation of multiple sources of evidence, chains of evidence, and member checking), This study therefore triangulate multiple sources of evidence in terms of IDP for different municipalities and how they are promoting the use of ICT as part of e-governance. Various municipal websites which were used under this study and executive members who were interviewed were validated. Internal validity (through the use of established analytic techniques such as pattern matching) analytic techniques through the use of computer software such as SPSS and Atlas Ti 7.2 to determine group of matching incidences, external validity (through analytic generalization), and reliability (through case study protocols and databases).

Stake(1995) discussed the issues regarding validation of the gathered data in a chapter called "Triangulation." Stake (1995) offered four strategies for triangulating data: data source triangulation this study used questionnaires and interviews to gather data concerning the uptake and usage of ICT by citizen in accessing municipality services. Investigator triangulation brings alternative perspectives, backgrounds and social characteristics (Neuman, 2014). This study interviewed executive members from municipalities with different background and social characteristics in order to understand the e-governance strategies which can be used to improve service delivery through ICT tools. Theory triangulation requires using multiple theoretical perspectives to plan a study or interpret the

data (Neuman, 2014). In this study, various e-governance theories were triangulated to get an understanding and evaluate which theory and theories can be used to feed into e-governance framework that could be used in local authorities to improve service delivery though the use of ICT. Methodological triangulation was applied in this study by mixing qualitative and quantitative research approaches and data to get a full understanding of the research questions for this study.

Data collected from questionnaires is deemed important to determine the degree to which it will be reliable and internally valid. In order to determine the reliability and internal consistency, the study used Cronbach's Alpha to measures the internal reliability of a set of related items (Hair, et al., 2006). This study used the following methods to enhance validity and reliability:

4.14.1 Triangulation

Neuman (2014) defines triangulation as the idea that looks at something from multiple points of view, which can improve accuracy. In this study, data source triangulation, investigator triangulation, theory triangulation and methodological triangulation was used.

4.14.2 Pre-testing

Reliability and validity for the interview guide and the questionnaire used for this study was increased by pre-testing and to check the practicability of these instruments (Kothari, 2004). External validity deals with the findings of a study being applicable or generalizable beyond the specific unit of analysis (Yin, 2003). Yin (2003) further argued that case study research has drawn much criticism, especially from studies utilizing only one case. This study addressed this criticism by using multiple case studies from six municipalities in Gauteng Province, which could represent other municipalities with similar status in South Africa.

However, the collected data was deemed important to determine the degree to which it was reliable and internally valid. Various methods can be used to measure reliability, but the common measure of reliability is internal consistency. This research assessed consistency of the entire scale by drawing on Cronbach's Alpha (Hair, et al., 2006). Cronbach's Alpha measures the internal reliability of a set of related items identified in this study.

4.15 Ethical consideration

The research ethics for this study was guided by the ethical requirements of the North West University for post graduate studies. See Annexure C for the ethical clearance certificate. Ethics is defined as a set of beliefs about right and wrong behaviour in society and describes the behaviour standards expected by a group (Reynolds, 2010). Reynolds (2010) explained that the research survey should only be carried out in the field once informed consent from the residents has been obtained. The researcher, however, did get consent and approval from the citizens who participated in this study. The researcher was honest, accountable and transparent with the community in this research process.

With the increased popularity of secondary data analysis from municipalities' minutes and other strategic documents the study guide against ethical issues by assuring that no harm came to a subject through loss of anonymity. The study ensured that anonymity is maintained by removing unnecessary identifying information prior to data analysis, and by introducing strict data storage and handling procedures to ensure confidentiality (Finlayson, Egan & Black, 1999).

In this study, the self-administered questionnaires were accompanied by an introductory letter highlighting the purpose of the research. The introductory letter explained the importance of respondents' participation in the research. Confidentiality was also guaranteed by assuring the participants that their information would not be made available to anyone who is not directly involved in the study. Bailey (2007) argued that it is the researcher's responsibility to assure personal confidentiality of the participants.

4.16 Summary of choices of research methodology for current study

4.16.1 Research methodology

The current study is descriptive, describing a phenomenon as it exists, and analytical to explain why or how something is happening as far as the uptake and use of ICT as part of e-governance in improving service delivery in local authorities is concerned.

4.16.2 Research reasoning

This research uses deductive and inductive thinking in a distinctive sequence to address the objectives of the study and to come up with e-governance framework that improves

4.16.3 Research paradigm (philosophy)

Quantitative research attempts to uncover reality and this reasoning forms the philosophical assumption surround the research topic of a framework of e-governance to improve service delivery by local authorities in South Africa.

4.16.4 Research approach

The research questions, which the research has posed, are both descriptive and explanatory; therefore the research direction is a mixed method approach.

This study applied a mixed approach in data collection through the use of self-administered questionnaires, from the six municipalities identified in the study and from interviews of executive members from these municipalities, data analysis and interpretation of the findings.

This study triangulated data collection methods by using interviews and self-administered questionnaires. The study also triangulated models or theories of e-governance models. Triangulation of data sources which include data from citizenry of Municipalities and Executives members from Gauteng Province was done.

4.16.5 Research design

Explanatory research identifies and explains the role of ICT as part of e-governance in improving service delivery in local authorities in South Africa. This research therefore followed a mixed-methods research approach in order to utilise the advantages of both quantitative and qualitative approaches.

The equal status design is used in this research in order to understand and explain the uptake and usage of ICT by citizens in improving service delivery. This design was carried out in two phases or sequentially:

(1) an initial quantitative instrument phase using self-administered questionnaire for citizens from the municipalities, followed by

(2) a qualitative data collection phase using interviews for executive members from identified municipalities.

Both data sets were used for descriptive and explanatory purposes.

4.16.6 Research process

Mixed method characteristics illustrated in Figure 4-2.

4.16.7 Research strategy

For the purpose of this study, this research used survey and case studies.

4.16.7.1 Survey

This research used the sample survey for home owners to get direction on research questions on the uptake and usage of ICTs by citizens.

4.16.7.2 Case study

This study however uses a multiple case study. of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality to understand phenomenon within its real life context of e-governance in these municipalities.

4.16.8 Reason for mixed method design

The reasons for using mixed method design in understanding e-governance in a bid to improve service delivery in South African local authorities are summarised in Table 4-1.

4.16.9 Population

This research focuses on two sets of population, namely,

(1) the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein Local municipality and Westonaria Local municipality citizenry, and
(2) the executives from those municipalities who are in charge of driving the municipalities strategic plans. Table 4-2 shows the population from each district municipality and the envisaged sample size.

4.16.10 Sampling

The population for this study is from Gauteng Province, which is divided into three metropolitan municipalities namely; the City of Ekurhuleni, the City of Johannesburg and the City of Tshwane. There are also the two district municipalities, namely Sedibeng and West

Rand. These districts are further subdivided into seven local municipalities. Table 4-2 illustrates the population size and the sample size. The researcher ensured that the sample is collected in a systematic manner, so that the impact of the sample members on the results can be estimated and evaluated.

4.16.10.1 Sampling procedure

(1) A non-probabilistic, purposive sampling approach was used to interview executive members of the City of Ekurhuleni, the City of Johannesburg, the City of Tshwane, Lesedi local municipality, Randfontein Local municipality and Westonaria local municipality who are responsible for driving the strategic plans for these municipalities.
(2) The study distributed self-administered questionnaires to citizenry of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality.

4.16.10.2 Sampling frame

The study involved residents under the jurisdiction of three Metropolitans, namely; City of Ekurhuleni, City of Johannesburg and City of Tshwane and three local municipalities from two Districts, namely Lesedi local municipality, Randfontein local municipality and Westonaria local municipality.

4.16.10.3 Sampling size

This applies to citizenry category of respondents who completed self-administered questionnaires. Sample size for the executive members of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality was purposively selected because they possess the information regarding the policies and strategies for these municipalities.

4.16.11 Data collection

The research used self-administered questionnaires, structured interviews and documentary analysis in collecting data for both quantitative and qualitative methodologies.

4.16.11.1 Primary data

The research used structured interviews to collect data from top level managers of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. The study developed 15 interview questions. Annexure B shows interview protocols for Executive Managers. Face-to face interviews have the highest response rate and permit the longest and most complex questionnaires. Researcher controlled the sequence of questions and can use some probes. In order to solve the challenge of response bias the research interviewed as many top level managers as possible and asked the same questions in different ways until the study gets to a point of saturation. Reliability, validity and practicability of the research instruments were guaranteed by pre-testing the interview guide.

A questionnaire was adopted as the appropriate data collection tool for the quantitative research in this study. The questionnaire was constructed to include the dependent variables as inferred from the secondary research and as specified in the research objectives of this study. This research used a quantitative self-administered questionnaire which is based on completely structured items with closed ended questions for different sections. These sections sought some answers on perceptions, attitudes and opinions on the uptake and use of ICT in improving service delivery in local authorities. Self-administered questionnaire was distributed to the selected respondents from identified sample from the population of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. Annexure A provides the English version of the questionnaire.

The current research study applied the Likert scale to the constructs of e-governance and service delivery model and how it improves service delivery. A draft questionnaire was developed using input from literature and the research questions. This questionnaire draft was pre-tested, modified and administered using convenience sampling in order to increase the reliability and validity of the findings.

4.16.11.2 Secondary data

The study made an analysis of Integrated Development Plans (IDP), minutes of meetings, strategic plan documents and the Statutory Acts of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality

and Westonaria local municipality which governs the operation of municipalities in understanding the role they should play in delivering services to the citizens.

4.16.12 Data analysis

This research adopted sequential explanatory strategy.

4.16.12.1 Quantitative analysis

Data preparation was done by extracting data from questionnaires so that these can be read and manipulated by computer software using SPSS. In this study numerical responses were entered into an electronic spreadsheet file for respondents who answered the questions on the questionnaire. For the purposes of this research, a combination of both charts and tables are used in producing the descriptive statistics, which relate to the demographic profile of the participants. Variables for this research are illustrated in Figure 3-8 in Chapter 3. The Factor Analysis focused on five factors, namely Internet usage and connectivity, municipality services, service delivery output, impact of e-governance and e-governance outcome.

4.16.12.2 Qualitative analysis

This study collected data from individual executive members of municipalities and managed to collect volume of data in natural conversation settings. Interviews recorded from executive members of municipalities were transcribed. In this analysis, five primary documents, namely P1, P2, P3 and P5, from the field were considered. In this study, the researcher used an electronic data analysis tool called Atlas.Ti 7.2. This study used Atlas.Ti to captures categories of incidents and properties of these categories as codes and quotations respectively and quotations are synonymous with incidents and codes or categories are groups of incidents whose choice was informed by the theoretical sensitivity of the researcher. In this study, the collected data was open coded and analyzed.

4.16.12.3 Content analysis

Although the content can be described as words, images, videos, tools, or services, this study focused on the websites content of the City of Ekurhuleni, City of Johannesburg, City of Tshwane, Lesedi local municipality, Randfontein local municipality and Westonaria local municipality. A content inventory of websites domain, of the municipalities' vision, mission, objectives, strategy, electronic services, other non-electronic services and websites hits by customers was created and was revisited throughout the analysis.

4.16.13 Assessing and demonstrating the quality and rigour of the research design

Various municipal websites which were used in this study and executive members who were interviewed were validated. Internal validity (through the use of established analytic techniques such as pattern matching) analytic techniques through the use of computer software such as SPSS and Atlas Ti 7.2 to determine group of matching incidences, external validity (through analytic generalization), and reliability (through case study protocols and databases).

Methodological triangulation was applied in this study by mixing qualitative and quantitative research approaches and data to get a full understanding of the research questions for this study. Data collected from questionnaires is deemed important to determine the degree to which it will be reliable and internally valid. In order to determine the reliability and internal consistency, the study used Cronbach's Alpha to measures the internal reliability of a set of related items.

4.16.13.1 Triangulation

In this study, data source triangulation, investigator triangulation, theory triangulation and methodological triangulation was used.

4.16.13.2 Pre-testing

This study addressed this criticism by using multiple case studies from six municipalities in Gauteng Province, which could represent other municipalities with similar status in South Africa.

This research assessed consistency of the entire scale by drawing on Cronbach's Alpha to measure the internal reliability of a set of related items identified in this study.

4.17 Chapter conclusion

This chapter discussed the different research approaches, namely qualitative, quantitative and the mixed method, as well as the motivation for selecting the mixed method for the current study. The deductive and inductive inquiry for scientific strategy was highlighted. The chapter discussed research philosophy of positivist, interpretivist and pragmatism. Research design of mixed methods was discussed by comparing the dominant/less dominant versus equal value status design. Research strategy of survey and multiple case studies was discussed. Population for the study, sampling and sampling procedure was highlighted.

Sampling frame and sample size was also discussed. Data collection and data analysis was highlighted. The chapter ended by discussing quality and rigour of the research design used for the study. The next chapter will discuss quantitative data analysis, presentation and discussion of the findings.

CHAPTER 5: QUANTITATIVE DATA ANALYSIS, PRESENTATION AND DISCUSSION OF FINDINGS

5.1 Introduction

This chapter will focus on empirical analysis and results gathered from the study. Quantitative data and findings from questionnaires data is reported, explained and interpreted in order to reach conclusions. This section present result of research findings derived from data analysis by using quantitative method. This section focuses on empirical analysis and results emanating from data gathered from 600 respondents participating in this study who completed questionnaires from six municipalities. Quantitative data analysis was done using SPSS. All statistical tests were done at 5% level of significance.

This chapter has three sections. First section discusses descriptive statistics which summarises sample data, using frequency tables and relationships between demographics. This is followed by second section, which explains factor analysis for items which were used to measure the role of ICT as part of e-governance in improving service delivery. Factor analysis for these items was used to measure factors that explain the role of ICT use in improving service delivery. Results of exploratory factor analyses were analysed. Normality of data was assessed and Cronbach's Alpha was used to assess reliability of constructs. Relationships between constructs that demonstrated sufficient validity and reliability were based on multiple independent variables and finally, gratifications was sought from using ICT in improving service delivery were analysed using independent samples t-tests. Last section deals with inferential analysis on the use of ICT for improving service delivery by local authorities were explored. Figure 5-1 depicts a flow diagram of quantitative analysis.

5.2 Descriptive statistics

Demographic profile was analysed using frequency tables. Comparison was made on key variables to assess how closely the sample characteristics resembled those of population as a whole.

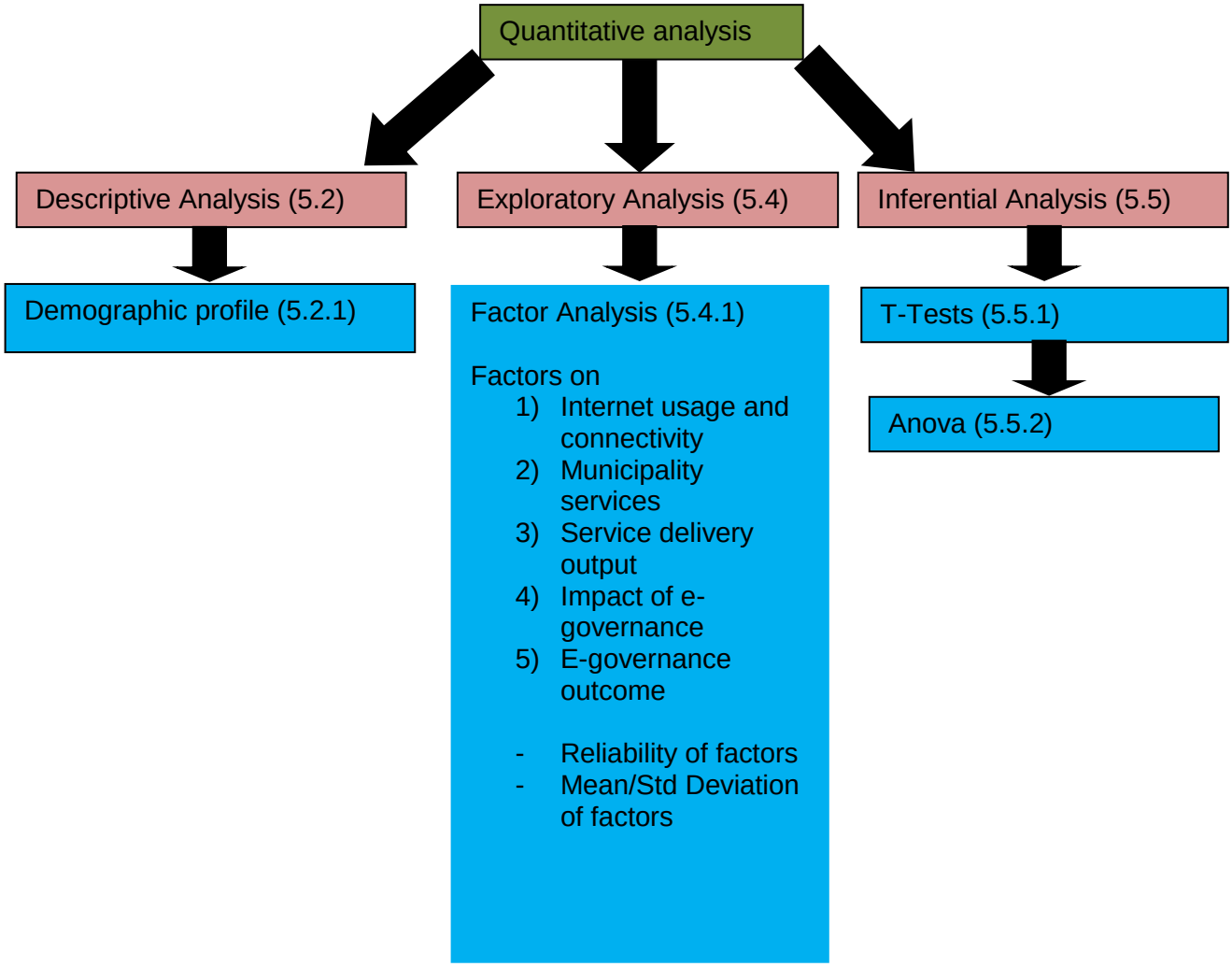

Figure 5-1: Flow diagram of quantitative analysis.

5.2.1 Demographic profile of survey respondents

Discussion on demographic characteristics of those who participated in the study through structured questionnaires is based on gender, age, level of education, occupation, gross monthly income and municipality they belong.

Table 5-1: Respondents demographic profile.

Gender			Age Group	
Male	46.2%		20-30	21.2%
Female	53.8%		31-40	38.2%
			41-50	28.2%
			51-60	10.3%
			61+	2.2%
Level of Education			**Occupation**	
Primary school	1.2%		Government Employee	32.0%
Matric	30.7%		Private sector employee	34.5%
Diploma	33.2%		Self employed	17.2%
Degree	23.3%		Academician	5.0%
Master's Degree	8.3%		Pensioner	2.3%
PhD	3.3%		Student	6.8%
			Other	2.2%
Gross Monthly Income				
Less than R5000	17.3%			
5000-10000	23.5%			
10001-20000	17.3%			
20001-30000	16.8%			
30001-40000	8.2%			
40001-50000	5.0%			
50001-60000	3.0%			
60001 and above	1.7%			
Not applicable	5.2%			
I don't want to answer	2.0%			

5.2.1.1 Gender

Gender distribution of participants was analysed using frequencies and results are presented in Table 5-1. The predominant participants were females (53.8%), with remainder of participants being males (46.2%). This implies that more female participated in the uptake and usage ICT as compared to their male counterparts. These results concurs with findings by Abu-Shanab and Al-Jamal (2015) who indicated in their study that women demonstrated

their interest in ICT by being more active than men in using their university accounts to access the Internet (5.9% of women as compared to 1.5% men). These results are in contrast with a study conducted by Mbatha and Lesame (2013) who established that there was a distinct male dominance in uptake of ICT.

These results do not agree with research done in Spain, where there is higher percentage of ICT users among men as compared to women; men tend to be first movers to use new ICT, and they also use it more than women (Gargallo-Castel, et al., 2010). These results differ from research carried out in Spain because of context in which this study was conducted. Spain is a developed country with high level of technology as compared to the level of technology penetration in Africa. It can also be deduced that men in Spain have more time to spend as compared to women who has more family responsibilities. This assertion have however been overtaken by fast penetration of technology and gender equality policies advocated in Africa. Gender however plays an important role in promotion, uptake and usage of ICT for service delivery by citizens at local level in South Africa as both male and female use services provided by municipalities.

5.2.1.2 Age

Furthermore, Table 5-1 shows distribution of respondents by age was measured using frequencies. Results revealed that (21.2%) were aged between 20–30 years; (38.2%) were between 31–40 years; (28.2%) were between 41–50 years; (10.3%) were aged between 51–60 years; (2.2%) were older than 60 years of age. From these findings, it is clear that majority of respondents were aged between 31–40 years, followed by those who were aged between 41–50 years, while those older than sixty years were minority in the group. These results imply that young people between the ages of 20–30 years who have just finished school or university actively participate in the uptake and usage of ICT as these age groups have time to spend with few responsibilities. This is followed by those who are in age groups 31–40. The numbers are decreasing as we move to older age groups of 31–40 years as the group have now much financial obligations, such as bond payments for their homes, vehicle loan repayment, and school fees. Their spending patterns shift from spending more money and time on the usage of and uptake of ICT and time on internet because of many responsibilities.

Findings of this study confirm those of the study by Khechine, Lakhal, Pascot and Bytha (2014), which reveal that of young people are more likely to adopt new IT products due to their tendency to pursue innovativeness. These findings almost concur with a study by Ayoo

(2001) who established that in developing countries those who are above the age of 40 years are often conservative and slow in keeping abreast of advances in ICT. Ayoo's (2001) study found a large number of respondents to be between the ages of 40–49 (47%), while a significant percentage of respondents fell in the 30-39 age group (28%).

5.2.1.3 Level of education

Table 5-1 also revealed that (1.2%) of the respondents attended primary school; (30.7%) with Matric education; (33.2%) with Diplomas; (23.3%) with Degrees; (8.3%) with Masters Degrees and (3.3%) with doctoral degree (PhD). This implies that citizens with Matric actively participate in the use and uptake of ICT. This could also mean that majority of people who are employed in private and government institutions have Matric as their highest qualification. Results also imply that there are few people with a doctoral degree, who actively participate in the use and uptake of ICT. Larger number of respondents with primary school level was from Randfontein local municipality (3.0%). Respondents with highest qualification of PhD were found in City of Tshwane (7.0%) and Lesedi local municipality (7.0%). These results reveal that those who are educated are in metro municipalities and those who are not educated are found in local district municipalities, mainly because they cannot afford the urban lifestyle.

Education appears to clearly influence adoption of e-government services. These findings concur with Mukonza, Maserumale and Moeti (2016) who found out that percentage of people who had used e-government and ICT services seemed to rise as level of education rose (Mukonza, et al., 2016). Table 5-2 shows distribution of level of education by municipality.

5.2.1.4 Occupation

Table 5-1 shows that in this study (32.0%) respondents who utilise services of municipalities were government employees, (34.5%) were private sector employees, (17.2%) were self-employed, (5.0%) were academicians; (2.3%) were pensioners; (6.8%) were students and (2.2%) were in other categories. Results imply that citizens who work in private sector have greater appreciation of uptake and usage of ICT as part of e-governance as their private companies offer them internet access which allow access to municipality services through their websites. Those who work in government make use of free WIFI and this encourages them to increase their uptake and usage of ICT to access municipality services. Few

Table 5-2: Frequency distribution by level of education by municipality.

Municipality	Level of Education	Percent
City of Ekurhuleni	Primary school	2.0
	Matric	32.0
	Diploma	31.0
	Degree	28.0
	Masters Degree	5.0
	PhD	2.0
	Total	**100.0**
City of Johannesburg	Primary school	1.0
	Matric	35.0
	Diploma	29.0
	Degree	29.0
	Masters Degree	5.0
	PhD	1.0
	Total	**100.0**
City of Tshwane	Primary school	1.0
	Matric	32.0
	Diploma	29.0
	Degree	17.0
	Masters Degree	14.0
	PhD	7.0
	Total	**100.0**
Lesedi local	Matric	24.0
	Diploma	37.0
	Degree	18.0
	Masters Degree	14.0
	PhD	7.0
	Total	**100.0**
Randfontein local	Primary school	3.0
	Matric	30.0
	Diploma	40.0
	Degree	23.0
	Masters Degree	4.0
	Total	**100.0**
Westonaria Local	Matric	31.0
	Diploma	33.0
	Degree	25.0
	Masters Degree	8.0
	PhD	3.0
	Total	**100.0**

students make use of ICT to access municipality services as these students are still staying with parents who are responsible for paying bills.

5.2.1.5 Gross monthly income

The research found out that 17.3% fall in income bracket of less than R5 000 per month, while 23.5% fall in income bracket of higher than R5 000–R10 000 per month as summarized in Table 5-1.5.2% shows that income does not apply to respondents who participated in this survey and 2.0% were not willing to disclosure their income. This research found out that income appears to influence the use of ICT and e-governance. These findings agree with Mukonza, Maserumale and Moeti (2016) who found out that income also appears to influence e-government adoption; of those with a low income (<R5 000 per month), a smaller percentage had adopted e-governance and ICT compared to the next income group. On the other hand, a relatively high percentage of people in medium income group had adopted the use of e-governance and ICT services. Those in high income groups seemed to constitute a significantly low percentage of people who were using e-governance and ICT services. This implies that high income group are preoccupied with other things besides spending their time on issues relating to ICT and e-governance.

The results contradicts findings by Bearfield and Browman (2016) who found out that those with higher levels of income were more likely to access government websites to get information and to use online services than those with lower incomes. Similar differences were found for users with higher levels of education versus those with less education (Bearfield & Browman, 2016). These results imply that those who have resources can afford to access municipality website and get whatever information they require and to do online transactions. The findings therefore indicate that there is high uptake and usage of ICT by those who are educated with high levels of income.

5.3 Exploratory analysis

5.3.1 Factor analysis

Factor analysis was carried out for the following reasons:

- To establish emerging factors from the designed questionnaire.
- To test the structure validity of the perceptions towards the use of ICTs in accessing municipality services.
- To explain relationships within a set of observed variables.

- To identify and explain variances observed in a much larger number of manifest variables.
- To screen variables for subsequent analysis.

The Kaiser-Meyer-Olkin (KMO) statistic shows a discrepancy between 0 and 1. Field (2012) argued that when the value is 0 this indicates diffusion in the pattern of correlations and that factor analysis is therefore inappropriate. Where the KMO value is close to 1, this indicates that the patterns of correlations are relatively compact and therefore a factor analysis will produce reliable factors (Field, 2012) as shown in Table 5-3. The covariance matrix was considered to be appropriate for exploratory factor analysis as KMO values of identified factors were close to 1.

Table 5-3: KMO values for e-governance factors.

Factor	KMO value
System quality	0.819
Information quality	0.903
Service of interest from Municipality	0.903
Access to online information	0.890
Motivation to seek Municipal information	0.840
Problems encountered	0.811
Standard of services	0.916
Access to online services	0.762
Value for money and choice and consultation	0.661
Efficiency of services	0.729
Convenient and interaction	0.782
Corruption	0.557
Accountability	0.689

The associated Bartlett's Test of Sphericity was found in all thirteen cases to be statistically significant as the p≤ .0000. A principal component analysis technique was used to extract factors from the data, which best describes underling relationships among variables eigenvalues exceeding 1.0 with loads of 0.30 were used for inclusion of items in the exploratory factor analysis. An Oblimin with Kaiser Normalization technique was applied. Bartlett's Test of Sphericity values are shown in Table 5-4.

Table 5-4: Bartlett's Test of Sphericity for e-governance factors.

Factor	Bartlett's Test of Sphericity
System quality	71.86%
Information quality	75.55%
Service of interest from Municipality	63.72%
Access to online information	64.00%
Motivation to seek Municipal information	64.60%
Problems encountered	64.09%
Standard of services	74.23%
Access to online services	86.30%
Value for money and choice and consultation	*66.73%*
Efficiency of services	78.30%
Convenient and interaction	74.32%
Corruption	64.43%
Accountability	76.46%

Findings on KMO and Bartlett's Test of Sphericity revealed that: **a)** The covariance matrix - was considered to be appropriate for the exploratory factor analysis as the KMO value of identified factors were ranging between 0.557–0.916 and therefore the KMO values are close to 1, which indicates that the patterns of correlations are relatively compact and therefore a factor analysis will produce reliable factors (Field, 2012). **b)** The associated Bartlett's Test of Sphericity was found in all thirteen cases to be statistically significant as the p≤ .0000.

Findings of the study on Reliability as measured by Cranach's Apha Table 5-5 reveal that all identified factors had acceptable levels of reliability of above .07 as measured by Cranach's Apha. This therefore shows high levels of internal consistency of the Likert scales used in the questionnaire.

Table 5-5: Cranach's Alpha for e-governance factors.

Factor	Cranach's Apha
System quality	0.902
Information quality	0.935
Service of interest from Municipality	0.908
Type of municipal information	0.894
Motivation to seek Municipal information	0.890
Problems encountered	0.825
Standard of services	0.950
Access to online services	0.921
Value for money and choice and consultation	*0.831*
Efficiency of services	0.860
Convenient and interaction	0.885
Corruption	0.695
Accountability	0.842

Table 5-6: Descriptive statistics for e-governance.

Variable	**N**	**Mean± Std. Deviation**
System quality	600	3.45±0.93
Information Quality	600	3.56±0.980
Type of services	600	2.10±1.079 1.78±0.820
Access to online service information	600	1.854±0.808 2.045±0.825
Motivation for seeking municipality information	600	3.672±0.9514
Problems encountered when accessing municipality information	600	2.5388±0.78675 2.6269±0.82517
Standard of services	600	2.9575±1.05579
Access to online services	600	3.0883±1.27363
Value for money	600	3.2438±1.02792
Efficiency of services	600	3.0883±1.27363
Convenience and level of interaction	600	3.5846±0.96475
Corruption	600	3.5383±0.93531
Accountability	600	3.6533±0.84541

The mean and standard deviation for attributes of e-governance by local authorities in South Africa are presented in Table 5-6. Highest mean value of measured item was 4.26 score with 0.47 standard deviation for system quality. Second highest mean value was 4.02 with 0.82 standard deviation score for 'Information quality'.

5.3.1.1 System quality

To analyse system quality as a factor affecting the use of electronic governance information that facilitate conditions for one to use municipality information on services offered from the internet/website, the exploratory factor analysis was used. Table 5-7 show results of the same.

Table 5-7: Likert scale - Information systems and information quality.

Factors affecting the use of electronic governance - System quality and Information quality. 1 = Strongly disagree; 2 = Disagree; 3 = Undecided; 4=Agree; 5= Strongly agree

System quality has been identified as a single factor and includes five aspects, such as:

(1) Municipality website is easy to use,
(2) Municipality website is easy to learn,
(3) I find it easy to get this website to do what I want it to do,
(4) Using the municipality website does not require a lot of efforts, and
(5) Using municipality website is not often frustrating.

A mean of **3.45** and a low standard deviation of **0.93** were confirmed for the factor System Quality. This mean indicates a tendency to lean more towards higher end of Likert scale, above 3 in Table 5-7implies that the municipality website is easy to learn, does not require a lot of effort and it is not frustrating. It therefore means that municipality websites are well-designed and encourages high uptake and usage of ICT by citizens in accessing municipality services. These results concur with studies conducted by United Nations (2010), which concluded that most government websites are now readily available and can easily be accessed.

5.3.1.2 Information quality

Factor analysis was done for items such as Accuracy: The website provides accurate information, Reliability: The website provides reliable information, Relevancy: The website

provides relevant information, Easiness: The website provides easy-to-understand information, information provided by this website is in useful format and information provided by this website meets my needs. A mean of **3.56** and a low standard deviation of **0.98** were confirmed for the factor Information Quality. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 in Table 5-7 which imply that municipality website provides accurate, reliable, relevant, easy to use and meet citizen's needs. The findings disagrees with the study carried out by Carrizales and Melitski (2011)who argued that Internet as a communication medium tends to favours individuals with good writing skills, and these individuals also tend to have greater access to financial resources and education. It therefore means that quality of information on website does not mean anything to people who are excluded due to poverty, digital divide or computer illiterate.

5.3.1.3 Type of service

Table 5-8: Likert scale - Type of services.

What services will you be interested in on the municipality website? (Please tick the appropriate box; 1=Very Undesirable; 2=Undesirable; 3= Neutral; 4= Desirable; 5=Very Undesirable)

Factor analysis was carried out on type of services by looking at items such as Drivers licence, Business licence, Bill statement, Payment of rates and taxes, Information on policies, Land information, Change of ownership, Payment of fines, Payment of water and electricity, Refuse and waste management, Parks and cemeteries and Emergency management services. A mean of **2.10** and a standard deviation of **1.079** were confirmed for the factor Type of services 1 and a mean of **1.78** and a low standard deviation of **0.82** were confirmed for the factor Type of service 2. This mean indicates a tendency to lean more towards higher end of the Likert scale, above 3 in Table 5-8 implies that all services identified were desirable, which makes citizens to visit municipality website or municipality offices. It therefore means that citizens will keep on using ICT tools as part of e-governance to access municipality services.

These findings concur with Melitski and Calista (2016) who argued that jurisdictions should continuously improve digitized government by offering enhanced customer services and affording heightened opportunities for citizen involvement. This finding indicates that useful

information about services offered should be on municipality website, which encourages citizens to continuously visit and use municipality website.

5.3.1.4 Access to online service information

Factor analysis was done for Renewing driver's license, Voter registration, National park information and reservations, Voting on the internet, Information on value added tax (VAT), public pension fund etc, Online payments, Online forms (downloading and submission), Licenses for example driving, death and marriage certificates (information and services), Medical information and services, Sponsorship information and services and contacts of various government offices. Respondents had an option of selecting "yes" or "no". A mean of **1.845** and a low standard deviation of **0.808** were confirmed for the factor Access to online service information 1. This mean indicates a tendency to lean more towards "yes". Results imply that more citizens use online services to access municipality services. And a mean of **2.05** and a low standard deviation of **0.83** were confirmed for the factor Access to online service information 2. This mean indicates a tendency to lean more towards "yes", which implies that few people do not use online services to access municipality online services.

Guided by the attributes offered by the TAM, it became evident that majority of citizens adopted e-governance initiative by making use of services offered online. Citizens who indicated that they have access to online services information were in agreement with Nkosi and Mekuria (2010) who observed that lack of customer service orientation from public sector staff, limited and inconvenient hours offered by government institutions and long distances to reach government offices are their reasons for using online information from municipalities.

5.3.1.5 Motivation for seeking municipality information

Table 5-9: Likert scale - Motivation for seeking municipality information.

What motivates you to seek municipality information? Please use the following criteria: 1-Strongly Disagree; 2-Disagree; 3-Undecided; 4-Agree; 5-Strongly Agree

Factor analysis was done for items such as a need for research information, to update my knowledge on municipality issues, a need for municipality services, for example licences, tender documents, certificates, medical services, scholarships etc, political issues, state of the municipality address, and personal interests. A mean of **3.67** and a low standard deviation of **0.95** were confirmed for the factor motive to seek municipality information. This

mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-9). The findings imply that citizens agree on what motivates them to seek municipality information. Results confirm findings by Mbatha and Lesama (2013) who reveals that South African government envisages that the inception of ICTs will promote and support electronic commerce applications, economic development and educational endeavours.

5.3.1.6 Problems encountered when accessing municipality information

Table 5-10: Likert scale - Problems encountered when accessing municipality information.

What problems do you encounter when you try to access this information? Tick the appropriate answer following the criteria below:1=Not at all a problem; 2=Minor problem; 3= Moderate problem; 4= Serious problem

Factor analysis for problems encountered when accessing municipality information was done. Factor analysis was performed on items such as poor infrastructure makes access difficult, information was too difficult to find, I do not have search skills, Information is complicated to understand, Internet usage is expensive, Important information on municipality website is located far, Language is a problem and Policy and regulation on internet usage do not support access of information. A mean of **2.5** and a low standard deviation of **0.77** were confirmed for the factor Problems encountered when accessing municipality information 1. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-10), which implies that citizens encounter serious problems in accessing municipality information. This discourages citizens to use and accept ICT as part of e-governance. They get frustrated by challenges they encounter in trying to access municipality information from the website. And a mean of **2.63** and a low standard deviation of **0.83** were confirmed for the factor Problems encountered when accessing municipality information 2. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 2 (Table 5-10), which implies that citizens encounter moderate problems in accessing municipality information. This however force citizens to continue persevere on the uptake and usage of ICT in trying to access municipality information through their website.

These results concur with findings by Chaterera (2012) who reviewed those respondents who participated in the study expressed dissatisfaction with technical challenges and

inadequacy of information offered by government websites of Zimbabwe. Chaterera (2012) indicated that most of these respondents reported that they did not depend on information provided by the Zimbabwe government online, and would rather visit government offices or make a telephone call. This implies that these challenges are common in Africa as it is still behind in terms of ICT infrastructure. The UN E-government Survey (United Nations, 2014) further reports that lack of access to both ICT and educational infrastructures, places major constraints on the development of e-government in developing countries, especially in Africa. South Africa is therefore facing such challenges. These results also agrees with Mawela, Ochara and Twinomurinzi (2017) who identifies that South Africa have 11 official languages and is faced with a challenge of ensuring that government caters appropriately to its citizens in their language of choice for service delivery. Mawela, et al., (2017) found out that local government authority assessed municipal websites and found that all municipal websites are in English which in fact concur with the results of this study. The situation therefore creates communication barriers with its citizens thereby causing a low uptake and usage of ICT by citizens. This discussion addresses research object 1.

5.3.1.7 Standard of service

Table 5-11: Likert scale - Standard of services.

Service delivery output. Please put tick mark on respective boxes Scale: 1=Very Ineffective; 2=Ineffective; 3= As Usual; 4=Effective; 5=Very Effective

Factor analysis was performed on items such as Municipality website provides reliable online services, Municipality website provides services at the times it promises, Municipality website gives prompt online services to citizens, Municipality website is designed with citizens' best interest at heart, Municipality website is designed to satisfy needs of citizens, Types of online services offered by municipality met my needs, Online services offered by municipality are accurate and Online services offered by municipality are up-to-date. A mean of **2.96** and a standard deviation of **1.56** were confirmed for the factor Standard of services. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-11), which implies that municipality offer effective standard of service to their citizens through e-governance.

The results agrees with (Pfeffer, Baud, Martinez, & Sridharan, 2008) who believed that more and better information can lead to more efficient planning and decision-making, and subsequently more effective urban governance in terms of inclusion which therefore indicate

that citizens interests are met. These augments addresses research objective number 2 which focus on assessing services offered by municipality.

5.3.1.8 Access to online service

Factor analysis was done for items such as Municipality is promoting access and use of online services, Online services are better than manual services and how is feedback like when you make an enquiry online? A mean of **3.09** and a standard deviation of **1.27** were confirmed for the factor Access to online services. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-11), which implies that municipalities effectively promote access to use of online services and offer better online services than manual and give online feedback to their citizens.

These results concur with Scholl and AlAwadhi (2015) and Scholl and Scholl (2014) who argued that local governments can play major roles in creating smart urban spaces, for example by making available modern and effective public administration and comprehensive online services based on novel ICTs, which indicate that municipalities should take a leading role in promoting access and use of online services. These augments addresses research objective 2 which focus on assessing services offered by municipality.

5.3.1.9 Value for money

Factor analysis for value for money was done. Factor analysis was performed for items such as Citizens are involved in budgeting process by municipality, Citizens are given opportunity to have payment plan options for their bills, Online services offered by municipality are priced correctly and Online services offered by municipality exceed my expectations. A mean of **3.24** and a standard deviation of **1.03** were confirmed for the factor Value for money. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-11).This imply that municipalities offers effective services which are of value to their citizens with services priced correctly. The results indicate that citizens are encouraged to pay for their bills if services are priced correctly. These augments addresses research objective 1 and 2 which focus on uptake and usage of ICT by citizens and object 2 for assessing services offered by municipality.

5.3.1.10 Efficiency of services

Table 5-12: Likert scale - Impact of e-governance.

Impact of e-governance [Please put tick mark (v) on respective boxes] Scale: Very Dissatisfied (1), Dissatisfied (2), As Usual (3), Satisfied (4), Very Satisfied (5)

Factor analysis was performed for items such as offering of online services by municipalities improve the speed on delivering services, efficiency of services encourages citizens to pay their bills and queuing for services is the thing of the past. A mean of **3.09** and a standard deviation of **1.27** were confirmed for the factor efficiency of services. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-12) which implies that citizens were very satisfied with efficiency of services from their municipalities.

The results concur with (Karunasena, Deng &Singh, 2011); Weerakkody, Irani, Lee, Osman& Hindi (2015) who reveals that the benefits expected from e-Government include innovations that can facilitate efficient delivery of government services which creates public value. It therefore indicates that online services saves citizen's time in doing business with municipality. These augments addresses research objective 1 which focus on uptake and usage of ICT and objective 2 for assessing services offered by municipality.

5.3.1.11 Convenience and level of interaction

Factor analysis for convenience and level of interaction was done. Factor analysis was done for items such as e-governance promote services to be offered 24/7, Distance and time is not an issue with e-governance, e-governance promote interaction between citizens and municipality and e-governance promotes interaction between municipality and its stakeholders. A mean of **3.58** and a low standard deviation of **0.96** were confirmed for the factor Convenience and level of interaction. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-12) which implies that citizens were very satisfied with convenience and level of interaction with their municipality.

Abasilimi and Edet (2015) highlighted the following as the benefits of e-governance: efficient delivery of government services to the public, better interactions with business organizations, and citizen empowerment through access to ICT. Abasilimi and Edet (2015) assertion agree with findings of this study, as municipality allows stakeholder participation through its various interactive platforms especially with metropolitan municipalities. These augments addresses research objective number 1 2 and 3 which focus on uptake and usage of ICT, objective 2 for assessing services offered by municipality and objective 3 for Examining existing e-governance theories and lessons learnt.

5.3.1.12 Corruption

Factor analysis was performed for items such as Middleman interference is removed, Adjudication of tender is done electronically - no interference of human beings and Cash transactions is eliminated. A mean of **3.54** and a standard deviation of **0.94** were confirmed for the factor Corruption. This mean indicates a tendency to lean more towards the higher end of the Likert scale, above 3 (Table 5-12) which implies that citizens were very satisfied on efforts made by municipalities in addressing corruption through the use of ICT tools.

Bertot, Jaeger & Grimes(2010) in their study found out that e-government can be used as a tool to prevent corruption. Lollar (2006) also reveal that if government's work cannot be seen or verified, then citizens are more likely to suspect corruption. These findings concur with the results found in this study. It indicates that corruption can be address by promoting e-governance in municipalities. These augments addresses research objective number 1 and 2 which focus on uptake and usage of ICT and objective 2 for assessing services offered by municipality.

5.3.1.13 Accountability

Table 5-13: Likert scale - e-governance outcome.

e-governance outcomes [Please put tick mark (v) on respective boxes] [Scale: 1= Strongly disagree; 2= Disagree; 3= Neither agree or disagree; 4=Agree; 5=Strongly agree

Factor analysis for accountability was done. Factor analysis was performed for items such as Implementation of e-governance by municipalities can make them answerable of their action and decision towards citizens, Implementation of e-governance by municipalities makes them answerable in their actions and decisions to stakeholders and I am able to communicate with government officials through the government website/email/ internet. A mean of **3.65** and a low standard deviation of **0.85** were confirmed for the factor Accountability. This mean indicates a tendency to lean more towards the higher end of Likert scale, above 3 (Table 5-13) which implies that citizens agree that e-governance brought accountability in municipality.

Mawela, et al., (2017) argued that ITC is not a backroom function but is part and parcel of trying to achieve this responsive and accountable local government. Argument by Mawela,

et al., (2017) agree with findings of this study which established that that transparency implies open access to government, communication from government, and implies that the government will be held accountable for their decisions and actions through the openness of information provided to the public. The study indicate that for successful implementation of e-governance in local authorities, municipalities needs to incorporate aspect of accountability in their framework that will check decisions made by municipalities in delivering services to citizens. These augments addresses research objective number 1, 2 and 3 which focus on uptake and usage of ICT and objective 2 for assessing services offered by municipality and objective 3 for framework e-governance in municipalities.

5.4 Inferential analysis

Inferential analysis has been used in this study as part of sequential exploratory study. This study used inferential analysis to make judgements on the observed difference between groups for gender and type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness for metro and local district municipalities. The study also used inferential analysis to make inferences on the observed differences between groups for access to internet and type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness for Metro and Local District municipalities.

5.4.1 Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) was employed to ascertain if there are any significant differences in the extent to which the different variables measures e-governance in different municipalities in dependent variables caused by individual main effects and the interaction between these variables.

5.4.1.1 T-Tests

The objective of this study was to examine and explain the uptake and usage of ICT tools for service delivery by citizens at selected local government municipalities in South Africa. To this end, the influence of demographic data and service delivery data on ICT usage and

service delivery was analysed using t-tests and one-way ANOVA tests for Metros and Local District Municipalities.

5.4.1.1.1 The influence of demographic characteristics on use of ICT usage for service delivery

T-tests and one-way ANOVAs were performed to investigate whether gender and internet access had an influence on ICT usage and service delivery for Metros and Local District Municipalities. The aim was to establish the accessibility to municipality's information, standard of services, choice, consultation and value for money, access to online services, efficiency of services, convenience and level of interaction, corruption, transparency and effectiveness. The following null hypotheses were formulated to investigate the stated relationships.

Hoa - There is no relationship between gender and type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness.

Hob – There is no relationship between access to internet and type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness.

5.4.1.1.2 Independent t-tests to assess the relationship between gender and identified variables for each municipality

A t-tests was conducted to ascertain if there exist significant relationship between gender for metros and local district municipalities and type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness all had a value smaller than 1.96 and significance levels > 0.05 for City of Ekurhuleni, City of Johannesburg, Lesedi local, Randfontein local and Westonaria local. The study rejects the **null Hypotheses H_0a (the notion that there is no relationship between gender and the aforementioned variables).**

Middleman interference is removed on tender process, Adjudication of tender is done electronically - no interference of human beings, Cash transactions are eliminated was statistically significantly different for City of Tshwane (t=-2.460, p=0.016), an independent samples t-test was performed in Table 5-14.

The findings reveal that there was thus not a significant difference between female and male with regard to type of services interested, type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness. All had a value smaller than 1.96 and significance levels > 0.05 for City of Ekurhuleni, City of Johannesburg, Lesedi local, Randfontein local and Westonaria local.

5.4.1.1.3 Independent t-tests to assess the relationship between Access to internet and identified variables for each municipality

A t-tests was conducted to ascertain if there exist significant relationship between access to internet and type of municipal information accessed online, motivation to seek municipality information, problems on accessing municipality information, standard of services, choice and consultation, access to online services, efficiency of services, convenience and interaction, accountability, transparency and effectiveness all had a value smaller than 1.96 and significance levels > 0.05 for City of Ekurhuleni and Westonaria local and therefore, the null hypothesis that assumes equal means could not be rejected. The study rejects the **null Hypotheses H_0b (the notion that there is no relationship between access to internet and the aforementioned variables).**

In order to investigate whether differences in the means between access to internet with regard to Problems on accessing municipality information, Convenience and interaction, Accountability, Transparency and Effectiveness for City of Johannesburg and Type of municipal information accessed online for City of Tshwane, Type of services interested for Lesedi Local and Type of services, Choice and Consultation, Transparency and Effectiveness for Randfontein were statistically significantly different, an independent samples t-test was performed. Results are summarised in Table 5-14 and Table 5-17.

The results therefore show that there was no significant difference between access to internet or not with regard to; Type of services interested, Type of municipal information accessed online, Motivation to seek municipality information, Problems on accessing

municipality, Standard of Services, Choice and Consultation, Access to online services, Efficiency of Services, Convenience and interaction, Accountability, Transparency and Effectiveness. All had a value smaller than 1.96 and significance levels > 0.05 for City of Ekurhuleni and Westonaria Local.

The results also indicate that all tested variables had a value lower than 1.96 at the 0.05 level of significance for City of Ekurhuleni and Westonaria local municipalities. The study, therefore rejects the null hypothesis (H_0b) that 'there is no relationship between access to internet and type of service interested, type of municipal information access online, motivation to seek municipal information, problems on assessing municipality information, standard of service, choice, consultation, access to online services, efficiency of service, convenience/level of interaction, corruption, accountability, transparency/effectiveness in municipality e-governance'.

5.4.2 ANOVAs

The analysis of demographic information provided an overview of the sample per Municipality and assessed whether respondent profiles were similar across six Municipalities. Type of services, Municipal information access, motivation for seeking information, problems encountered when accessing information, standard of services, access to online services choice and consultation and value for money, efficiency of services, convenience, level of interaction and corruption, accountability, transparency and efficiency measures were analysed by means of various statistical techniques. A one-way analysis of variance (ANOVA) and the Welch robust test for equality of means were used to test for significant variations between measures. Where applicable, post hoc tests were conducted to ascertain nature of group differences. The findings of one-way ANOVA, Welch test and post hoc tests are discussed in this chapter.

5.4.2.1 Influence of demographic and other e-governance variables

In order to investigate whether statically significant differences existed between the eight variables age, education, occupation and income categories (independent variable for the ANOVA) and motive to seek municipality information, standard of services, choice, consultation and value for money, access to online services, efficiency of services, convenience and level of interaction, corruption, transparency and effectiveness (dependent variable), a one-way ANOVA was conducted. An ANOVA was the appropriate technique as

Table 5-14: Independent samples test for gender and City of Ekurhuleni, City of Johannesburg and City of Tshwane (Metros).

Construct	City of Ekurhuleni			City of Johannesburg			City of Tshwane		
	T-test			T-test			T-test		
	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)
Type of services interested 1	-.727	98	.469	-.391	98	.696	-.453	98	.651
Type of services interested 2	-1.144	98	.256	-1.092	98	.278	.003	98	.997
type of municipal information accessed online 1	-.480	98	.632	-1.172	98	.244	-.488	98	.627
Type of municipal information accessed online 2	.471	98	.639	-1.017	98	.311	-.189	98	.850
Motivation to seek municipality information	-.863	98	.390	.576	98	.566	.482	98	.631
Problems on accessing municipality information 1	1.050	98	.296	-.152	98	.880	1.229	98	.222
Problems on accessing municipality information 2	1.735	98	.086	.632	98	.529	.159	98	.874
Standard of Services	-.900	98	.370	-.591	98	.556	-1.118	98	.266
Choice, Consultation and value for money	.557	98	.579	-.147	98	.883	-.156	98	.876
Access to online services	-.688	98	.493	.356	98	.723	-.784	98	.435
Efficiency of Services	-.688	98	.493	.356	98	.723	-.784	98	.435
Convenience and interaction	.687	98	.494	.824	98	.412	-1.659	98	.100
Corruption	1.355	98	.178	-.625	98	.533	-2.460	98	.016
Accountability	.290	98	.772	.437	98	.663	.152	98	.880
Transparency and Effectiveness	.127	98	.899	.848	98	.398	-.824	98	.412

Table 5-15: Independent sample test for gender and Lesedi, Randfontein and Westonaria (Local District Municipalities).

Construct	Lesedi Local			Randfontein Local			Westonaria Local		
	T-test			T-test			T-test		
	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)
Type of services interested 1	.082	98	.935	-.850	98	.398	-.203	98	.840
Type of services interested 2	.643	98	.522	-.653	98	.515	.964	98	.337
Type of municipal information accessed online 1	-.133	98	.894	-.291	98	.772	-.716	98	.476
Type of municipal information accessed online 2	-.981	98	.329	-.062	98	.951	-.879	98	.381
Motivation to seek municipality information	.441	98	.660	.889	98	.376	-.277	98	.782
Problems on accessing municipality information 1	-1.864	98	.065	.238	98	.813	.323	98	.747
Problems on accessing municipality information 2	.781	98	.437	-1.189	98	.237	-1.396	98	.166
Standard of Services	.503	98	.616	-.333	98	.740	-1.099	98	.274
Choice and Consultation	-.523	98	.602	-.294	98	.770	-.951	98	.344
Access to online services	.312	98	.756	-.991	98	.324	-.875	98	.384
Efficiency of Services	.312	98	.756	-.991	98	.324	-.875	98	.384
Convenience and interaction	-.009	98	.993	.390	98	.698	1.047	98	.298
Corruption	.436	98	.664	.492	98	.624	.868	98	.387
Accountability	.131	98	.896	-1.209	98	.230	.596	98	.553
Transparency and Effectiveness	-.448	98	.655	-.620	98	.537	-.049	98	.961

Table 5-16: Independent sample test for access to internet and City of Ekurhuleni, City of Johannesburg and City of Tshwane.

Construct	City of Ekurhuleni			City of Johannesburg			City of Tshwane		
	T-test			T-test			T-test		
	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)
Type of services interested 1	-.659	98	.512	-.368	98	.714	-.090	98	.929
Type of services interested 2	-.864	98	.390	-.415	98	.679	-1.859	98	.066
Type of municipal information accessed online 1	-1.682	98	.096	-1.064	98	.290	-.561	98	.576
Type of municipal information accessed online 2	-1.832	98	.070	-.592	98	.555	-1.994	98	.049
Motivation to seek municipality information	.737	98	.463	.980	98	.329	-.411	98	.682
Problems on accessing municipality information 1	-1.517	98	.133	-.858	98	.393	.044	98	.965
Problems on accessing municipality information 2	-.410	98	.683	-2.361	98	.020	-.020	98	.984
Standard of Services	-.881	98	.381	.316	98	.752	-.218	98	.828
Choice and Consultation	.955	98	.342	1.814	98	.073	-.116	98	.908
Access to online services	.207	98	.837	1.742	98	.085	-1.657	98	.101
Efficiency of Services	.207	98	.837	1.742	98	.085	-1.657	98	.101
Convenience, interaction and value for money	-.372	98	.711	2.622	98	.010	.471	98	.639
Corruption	-.556	98	.579	2.365	98	.020	.837	98	.405
Accountability	-.746	98	.457	3.471	98	.001	.054	98	.957
Transparency and Effectiveness	-.556	98	.580	3.151	98	.002	-.100	98	.920

Table 5-17: Independent sample test for access to internet and Lesedi, Randfontein and Westonaria (Local District Municipalities).

Construct	Lesedi Local			Randfontein Local			Westonaria Local		
	T- test			T-test			T-test		
	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)	T	Df	Sig. (2-tailed)
Type of services interested 1	-.943	98	.348	-1.481	98	.142	-1.537	98	.128
Type of services interested 2	-3.160	98	.002	-2.224	98	.028	-.924	98	.358
Type of municipal information accessed online 1	-1.453	98	.150	-1.280	98	.204	-1.387	98	.168
Type of municipal information accessed online 2	-3.345	98	.001	.289	98	.773	.207	98	.836
Motivation to seek municipality information	.364	98	.717	1.314	98	.192	-.329	98	.743
Problems on accessing municipality information 1	-1.089	98	.279	-1.701	98	.092	-.777	98	.439
Problems on accessing municipality information 2	-.070	98	.945	.165	98	.869	.122	98	.903
Standard of Services	.973	98	.333	.992	98	.324	-.065	98	.949
Choice, Consultation and value for money	.998	98	.321	2.474	98	.015	.329	98	.743
Access to online services	-.545	98	.587	1.702	98	.092	.285	98	.776
Efficiency of Services	-.545	98	.587	1.702	98	.092	.285	98	.776
Convenience and interaction	.622	98	.535	1.761	98	.081	-.300	98	.765
Corruption	.365	98	.716	.041	98	.967	.159	98	.874
Accountability	.874	98	.384	1.165	98	.247	.363	98	.717
Transparency and Effectiveness	1.505	98	.136	2.336	98	.022	.317	98	.752

Table 5-18: Influence of age, education, occupation and income on the factors.

Construct	AGE			EDUCATION			OCCUPATION			INCOME		
	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.
Type of services interested 1	4	1.210	.305	5	.672	.644	6	4.715	.000	9	3.341	.001
Type of services interested 2	4	1.749	.138	5	2.254	.048	6	3.428	.002	9	2.259	.017
Type of municipal information accessed online 1	4	2.129	.076	5	1.922	.089	6	.863	.522	9	1.382	.193
Type of municipal information accessed online 2	4	1.409	.229	5	4.614	.000	6	2.055	.057	9	1.900	.049
Motivation to seek municipality information	4	1.621	.167	5	1.048	.389	6	1.241	.283	9	1.265	.253
Problems on accessing municipality information 1	4	1.176	.320	5	1.005	.414	6	1.789	.099	9	1.088	.369
Problems on accessing municipality information 2	4	.482	.749	5	1.066	.378	6	2.376	.028	9	1.329	.218
Standard of Services	4	2.241	.063	5	3.159	.008	6	2.605	.017	9	2.441	.010
Choice, consultation and value for money	4	3.057	.016	5	2.197	.053	6	2.234	.039	9	4.996	.000
Access to online services	4	1.916	.106	5	2.750	.018	6	2.189	.043	9	4.606	.000
Efficiency of Services	4	1.916	.106	5	2.750	.018	6	2.189	.043	9	4.606	.000
Convenience and interaction	4	1.167	.324	5	2.276	.046	6	1.270	.269	9	1.115	.349
Corruption	4	.427	.789	5	1.455	.203	6	.403	.877	9	2.478	.009
Accountability	4	.383	.821	5	1.836	.104	6	.559	.763	9	1.641	.100
Transparency and Effectiveness	4	2.017	.091	5	1.829	.105	6	.917	.482	9	2.223	.019

opposed to a t-test, because age consisted of eight categories and all dependant variables were interval-scaled. The following is the null hypotheses used in the study.

Hoaa – There is no relationship between age, education, occupation, income and motive to seek municipality information, standard of services offered by municipalities, choice, consultation and value for money, access to online services, efficiency of services, convenience and level of interaction, corruption, transparency and effectiveness on e-governance.

5.4.2.1.1 Influence of age and other e-governance variables

In a bid to address research objectives: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. 2) Access and explain services offered to citizens by local authorities in South Africa. The ANOVA results in Table 5-15 above reveals that age had no influence on motive to seek municipality information (F=1.621, p=0.167), standard of services (F=2.241, p=0.063), access to online services (F=1.916, p=0.106), efficiency of services (F=1.916, p=0.106), convenience and level of interaction (F=1.167, p=0.324), corruption (F=0.427, p=0.789) and transparency and effectiveness (F=2.017, p=0.091). The results imply that age has nothing to do with motive to seek municipal information and access to online services as major variables which determines citizen uptake and usage of ICT tools.

On the other hand, age had a statistically significant influence on choice, consultation and value for money (F=3.057, p=0.016). The results imply that citizens are concerned by the choices they made when accessing municipality services and they value any service they pay for. **Therefore, the null hypotheses which deals with factors** motive to seek municipality information, standard of services offered by municipalities, access to online services, efficiency of services, convenience and level of interaction, corruption, transparency and effectiveness **were failed to be rejected while hypotheses which deals with** choice, consultation and value for money had to be re-examined, using a post-hoc test.

Considering that age categories were not equal in terms of intervals chosen, the post-hoc test was conducted to identify which of the age sub-group(s) showed statistically significant differences with regard to choice, consultation and value for money. The post-hoc test for choice, consultation and value for money did not show any statistically significant differences in the means of age groups. **Therefore, the null hypothesis for** convenience and level of interaction **failed to be rejected.** The post-hoc test for choice, consultation and value for

money showed significant differences between the age groups 20-30 years and 31-40 years, between 41-50 years, 51-60 and 61+ years, and thus **the null hypothesis for** choice, consultation and value for money **was rejected.**

5.4.2.1.2 Influence of level of education and other e-governance variables

In addressing the research objective: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. The ANOVA results on Table 5-15 above indicated that level of education had influence on change of ownership, payment of fines, payment of water and electricity, refuse and waste, parks and cemeteries and emergency services (F=2.254, p=0.048), online forms, licences and marriages, medical information, sponsorship information and contracts (F=4.614, p 0.000), standard of services (F=3.159, p=0.008), access to online services and efficiency of services (F=2.750, p=0.018), convenience and level of interaction (F=2.276, p=0.046). These results imply that education influences the uptake and usage of ICT by citizens as it addresses research objective 1. The results agree with Carrizels (2008) who assumes that educational level informs attitudes and decisions with regard to the application of technology in the e-government context.

On the other hand, level of education had no statistically significant influence on Type of services interested 1 (F=0.672, p=0.644), Type of municipal information accessed online 1 (F=1.922, p=0.089), Motivation to seek municipality information (F=1.018, p=0.389), Problems on accessing municipality information 1 (F=1.005, p=0.414), Problems on accessing municipality information 2 (F=1.066, p= 0.378), Choice and Consultation (F=2.197, p= 0.53), Middleman interference is removed on tender process, Adjudication of tender is done electronically (F=1.455, p=0.203), Accountability (F=1.836, p=0.104) and Transparency and Effectiveness (F=1.829, p= 0.105). The results imply that level of education do not influence aspects or variables that are beyond their control such as problems to do with infrastructure and technical issues in the design of municipality website and the municipal internal processes.

5.4.2.1.3 Influence of occupation and other e-governance variables

In addressing the research objective: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. The ANOVA results in Table 5-15 above revealed that occupation had no influence on Type of municipal information accessed online 1 (F=0.863, p=0.522), Type of municipal information accessed

online 2 (F=2.055, p= 0.057), Motivation to seek municipality information (F=1.241, p= 0.283), Problems on accessing municipality information (F=1.789, p= 0.099), Convenience and interaction (F=1.270, p= 0.269), Middleman interference is removed on tender process, Adjudication of tender is done electronically - no interference of human beings, Cash transactions are eliminated (F=0.403, p=0.877), Accountability (F=0.559, p=0.763), Transparency and Effectiveness (F=0.917, p=0.482). The results imply that occupation do not play a role on type of information accessed online, motivation to seek municipal information and problems encountered on accessing municipal information as anyone regardless of their occupation can access different type of information from municipality and can encounter problems of network when trying to access online services. The results also indicate occupation does not affect adjudication of tender as it has to do with internal processes of municipalities. These findings address research objective 1.

On the other hand, occupation had a statistically significant influence on Type of services interested 1 (F=4.715, p=0.000), Type of services interested 2 (F=3.428, p= 0.002), Problems on accessing municipality information 2 (F=2.376, p= 0.028), Standard of Services (F=2.605, p=0.017), Choice and Consultation (F=2.234, p=0.039), Access to Online (F=2.189, p=0.43), and Efficiency of Services (F=2.189, p= 0.043). The results indicate that occupation play a role in understanding services offered by municipalities. Students could not be interested on services offered by municipalities as they do not have responsibility to pay for such services. Results imply that those who are working have access to online services and are interested on the efficiency of services offered by municipality which encourages the uptake and usages of ICT in accessing such services. The findings addresses research objective 1.

5.4.2.1.4 Influence of income and other e-governance variables

In a bid to address research objective: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. The ANOVA results in Table 5-15 above indicated that income had no influence on Type of municipal information accessed online 1 (F=1.382, p=0.193), Motivation to seek municipality information (F=1.265, p= 0.253), Problems on accessing municipality information 1 (F=1.088, p= 0.369), Problems on accessing municipality information 2 - (F=1.329, p= 0.218), Convenience and interaction (F=1.115, p= 0.349), Accountability (F=1.641, p=0.100). The findings imply that income does not play a role on type and motivation to seek municipality information as well as problems in accessing municipal information and on the convenience, interaction and accountability issues. The results indicate that these variables

affect everyone regardless of one's income. These findings address research question 1 and 2.

On the other hand, income had a statistically significant influence on Type of services interested 1 (F=3.341, p=0.001), Type of services interested 2 (F=2.259, p= 0.017), Type of municipal information accessed online 2 (F=1.900, p=0.049), Standard of Services, Choice and Consultation, Access to online services and Efficiency of Services (F=4.606, p= 0.000) and Transparency and Effectiveness (F=2.223, p=0.019). It implies that income plays a role in aspects which affects citizens directly, such as type of services offered by municipalities as well as the efficiency of services. The finding addresses research objective 2.

5.4.2.2 Influence of municipality and other e-governance variables

In a bid to address the research objectives: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. 2) Access and explain services offered to citizens by local authorities in South Africa. The ANOVA results in Table 5-16 above indicated that municipality had no influence on all of the factors from Type of services interested 1 to Transparency and Effectiveness, since their p value is less than 0.05. The findings imply that municipality whether metro or local district municipality do not affect the identified variables. These findings address research question 1 and 2.

5.4.2.2.1 Influence of municipality and other e-governance variables

In addressing research objective: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. The ANOVA results in Table 5-16 above revealed that access to internet had no influence on Motivation to seek municipality information (F=2.978, p= 0.085), Standard of Services (F=0.081, p=0.775), Access to online services and Efficiency of Services (F=0.452, p=0.502). The results imply that access to internet has nothing to do with motivation to seek municipal information, standard of service as well as access to online services and efficiency.

The results agrees with the findings of Russell (2013) who found out that citizens do not use or benefit from the internet as they have certain cultural views or have a mistrust of government or technology. This statement therefore supports the reason as to why access to internet had no influence on motivation to seek municipal information. These results address research objective 1.

Table 5-19: ANOVA - Influence of municipality, access to internet, frequency of using internet, motivation of using network, security of website and access to municipality services on the factors.

Construct	Municipality			Access to internet			Frequency of using internet			Motivation of using network			Security of website			Access to municipality services		
	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.	Df	F	Sig.
Type of services interested 1	5	7.189	.000	1	4.095	.043	4	5.991	.000	3	2.077	.102	5	3.131	.008	3	.417	.741
Type of services interested 2	5	9.217	.000	1	14.376	.000	4	1.758	.136	3	2.588	.052	5	2.390	.037	3	2.940	.033
Type of municipal information accessed online 1	5	8.395	.000	1	14.629	.000	4	4.525	.001	3	2.167	.091	5	1.929	.088	3	7.752	.000
Type of municipal information accessed online 2	5	11.907	.000	1	8.973	.003	4	3.736	.005	3	6.066	.000	5	3.729	.002	3	6.645	.000
Motivation to seek municipality information	5	9.323	.000	1	2.978	.085	4	4.787	.001	3	2.127	.096	5	2.991	.011	3	.379	.768
Problems on accessing municipality information 1	5	7.308	.000	1	4.737	.030	4	1.704	.148	3	2.560	.054	5	1.219	.298	3	.573	.633
Problems on accessing municipality information 2	5	4.178	.001	1	4.474	.035	4	3.580	.007	3	1.975	.117	5	2.591	.025	3	.707	.548
Standard of Services	5	9.228	.000	1	.081	.775	4	10.123	.000	3	8.266	.000	5	2.479	.031	3	1.307	.271
Choice, consultation ad value for money	5	11.760	.000	1	9.104	.003	4	11.115	.000	3	6.529	.000	5	5.186	.000	3	.986	.399
Access to online services	5	9.441	.000	1	.452	.502	4	11.700	.000	3	7.771	.000	5	3.761	.002	3	2.345	.072
Efficiency of Services	5	9.441	.000	1	.452	.502	4	11.700	.000	3	7.771	.000	5	3.761	.002	3	2.345	.072
Convenience and interaction	5	4.238	.001	1	10.598	.001	4	6.091	.000	3	.943	.419	5	4.099	.001	3	2.845	.037
Corruption	5	7.032	.000	1	9.628	.002	4	2.882	.022	3	1.010	.388	5	1.984	.079	3	3.445	.017
Accountability	5	10.399	.000	1	19.911	.000	4	5.304	.000	3	1.394	.244	5	3.052	.010	3	4.228	.006
Transparency and Effectiveness	5	12.518	.000	1	22.714	.000	4	4.812	.001	3	1.658	.175	5	6.367	.000	3	4.433	.004

On the other hand, access to internet had a statistically significant influence on Type of services interested 1 (F=4.095, p=0.043), Type of services interested 2 (F=14.376, p= 0.000), Type of municipal information accessed online 1 (F=14.629, p=0.000), Type of municipal information accessed online 2 (F=8.973, p=0.003), Problems on accessing municipality information 1 (F=4.737, p= 0.030), Problems on accessing municipality information 2 (F=4.474, p= 0.035), Choice and Consultation (F=9.104, p= 0.003), Convenience and interaction (F=10.598, p= 0.001), Corruption (F=9.628, p=0.002), Accountability (F=19.911, p=0.000) and Transparency and Effectiveness (F=22.714, p=0.000). The findings imply that citizens are motivated in accessing internet in order to know the services offered by municipalities and to enjoy the benefits which come with online services. These benefits concur with the benefits identified by Karunasena, et al. (2011); Weerakkody, et al. (2015) when they state that the benefits expected from e-government include innovations that can facilitate the efficient delivery of government services which creates public value. The findings addresses research objective 1 on uptake and usage of ICT by citizens.

5.4.2.2.2 Influence of frequency of using internet and other e-governance variables

In addressing the research objectives: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. 2) Access and explain services offered to citizens by local authorities in South Africa. The ANOVA results in Table 5-16 above indicated that frequency of using internet had no influence on Type of services interested 2 (F=1.758, p= 0.136) and Problems on accessing municipality information 1 (F=1.704, p= 0.148). The findings indicate that some citizens do not use internet to access municipality services, instead they visit municipality offices should they require a particular service.

On the other hand, frequency of using internet had a statistically significant influence on Type of services interested 1 (F=5.991, p=0.000), Type of municipal information accessed online 1 (F=4.525, p=0.001), Type of municipal information accessed online 2 (F=3.736, p=0.005), Motivation to seek municipality information (F=4.787, p= 0.001), Problems on accessing municipality information 2 (F=3.580, p= 0.007), Standard of Services (F=10.123, p=0.000), Choice and Consultation (F=11.115, p= 0.000), Access to online services and Efficiency of Services (F=11.700, p=0.000), Convenience and Interaction (F=6.091, p= 0.000), Corruption (F=2.882, p=0.022), Accountability (F=5.304, p=0.000) and Transparency and Effectiveness (F=4.812, p=0.001). The results imply that citizens use internet to access municipality services and they do this at different times depending on what kind of online

services being accessed from municipality. These findings address research objective 1 and 2.

5.4.2.2.3 Influence of motivation of using a particular network and other e-governance variables

To address research objective: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. The ANOVA results in Table 5-16 above revealed that motivation for using a particular network had no influence on Type of services interested 1 (F=2.077, p=0.102), Type of services interested 2 (F=2.588, p= 0.052), type of municipal information accessed online 1 (F=2.167, p=0.091), Motivation to seek municipality information (F=2.127, p= 0.096), Problems on accessing municipality information 1 (F=2.560, p= 0.054), Problems on accessing municipality information 2 (F=1.975, p= 0.117), Convenience and Interaction (F=0.943, p= 0.419), Middleman interference is removed on tender process, Adjudication of tender is done electronically - no interference of human beings, Cash transactions are eliminated (F=1.010, p=0.388), Accountability (F=1.394, p=0.244), Transparency and Effectiveness (F=1.658, p=0.175). The results indicate that citizens use different network available in the country such as MTN, Vodacom, Cell C, Telkom to access municipality online services despite their costs and availability of network.

Whereas motivation for using a particular network had a statistically significant influence on Type of municipal information accessed online 2 (F=6.066, p= 0.000), Standard of Services (F=8.266, p=0.000), Choice and (F=6.529, p=0.000), Access to online services and Efficiency of Services (F=7.771, p=0.000). The findings imply that citizens prefer a particular network to access online service from municipality due to its efficiency in terms of availability of network as well as cost. These findings address research objective 1 and 2.

5.4.2.2.4 Influence of security of municipality website and other e-governance variables

To address research objectives: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. 2) Access and explain services offered to citizens by local authorities in South Africa. The ANOVA results in Table 5-16 above indicated that security of municipality website had no influence on Type of municipal information accessed online 1 (F=1.929, p=0.088), Problems on accessing municipality information (F=1.219, p=0.298) and Corruption (F=1.984, p=0.079). The findings indicate that citizens are not worried about security on municipality website. This could indicate that these citizens are not actively involved in transacting online with municipality

and therefore could not see and experience security issues associated with particular municipality website.

On the other hand, security of municipality website had a statistically significant influence on Type of services interested 1 (F=3.131, p=0.008), Type of services interested 2 (F=2.390, p= 0.037), Type of municipal information accessed online 2 (F=3.729, p=0.002), Motivation to seek municipality information (F=2.991, p=0.011), Problems on accessing municipality information 2 - (F=2.591, p=0.025), Standard of Services (F=2.479, p=0.031), Choice and Consultation (F=5.186, p= 0.000), Access to online services and Efficiency of Services (F=3.761, p=0.002), Convenience and Interaction (F=4.099, p= 0.001), Accountability (F=3.052, p=0.010) and Transparency and Effectiveness (F=6.367, p=0.000).

The results imply that security is an issue to those citizens who access online services from the municipality. On issue of privacy and security the results agrees with Hughes (2012) who warns that while e-government enhances service delivery, it equally enhances surveillance capability over citizens in society. Hughes (2003) further argues that electronic communication, such as e-mail, is recorded and can be traced far more easily than ordinary mail. The citizens who uses online services from municipality therefore requires guarantee that their information they supply is secure and safe. The results address research objective 1.

5.4.2.2.5 Influence of access to municipality services and other e-governance variables

To address research objectives: 1) Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa. 2) Access and explain services offered to citizens by local authorities in South Africa. The ANOVA results in Table 5-16 above indicate that access to municipality services had no influence on Type of services interested 1 (F=0.417, p=0.741), Motivation to seek municipality information (F=0.379, p= 0.768), Problems on accessing municipality information 1 (F=0.573, p= 0.633), Problems on accessing municipality information 2 - (F=0.707, p= 0.548), Standard of Services (F=1.307, p=0.271), Choice and Consultation (F=0.986, p=0.399), Access to online services and Efficiency of Services (F=2.345, p=0.072). The results indicate that access to municipal services is not determined by the type of services which are being offered by municipality, problems in accessing municipality information or efficiency of services as these citizens might not have anything to do with municipality.

On the other hand, access to municipality service had a statistically significant influence on Type of services interested 2 (F=2.940, p= 0.033), Type of municipal information accessed

online 1 (F=7.752, p=0.000), Type of municipal information accessed online 2 (F=6.645, p=0.000), Convenience and interaction (F=2.845, p=0.037), Corruption (F=3.445, p=0.017), Accountability (F=4.228, p=0.006) and Transparency and Effectiveness (F=4.433, p=0.004). The findings imply that citizens who access municipality services are concerned about type of services offered by municipality and the information which is found on municipality website as well as issues around accountability, transparency and efficiency.

The results concur with Falabi (2007) who highlighted that ICTs is used to improve efficiency, effectiveness, transparency and accountability in the delivery of public goods and services to the people, as well as how government institutions relate among themselves and with citizens. This finding is congruent with Scott's (2011) assertion that citizens expect an open government more today than ever before and demand accountability and transparency through direct input on the issues that affect them. Citizens who uses online services from municipalities therefore requires to see ICT initiatives offer such benefits. These findings address research objective 1 on the uptake and usage of ICT by citizens.

5.5 Chapter conclusion

This chapter focused on empirical analysis and results gathered from the study. Statistical analysis of quantitative data and narrative description of qualitative data was reported in this chapter. Findings from primary data through questionnaires and interviews were reported, explained, interpreted and conclusions were drawn.

The section presented result of research findings derived from data analysis by using quantitative method. The section focused on empirical analysis and results emanating from data gathered from 600 respondents participated in this study who completed questionnaires from six municipalities. Quantitative data analysis was done using SPSS.

The chapter presented descriptive statistics which summarises sample data, using frequency tables and relationships between demographics. This was followed by second section which deals with factor analysis for items used to measure the role of ICT as part of e-governance in improving service delivery. The chapter ended by exploring inferential analysis on the use of ICT for improving service delivery by local authorities.

CHAPTER 6: QUALITATIVE DATA ANALYSIS, PRESENTATION AND DISCUSSION OF FINDINGS

6.1 Introduction

The previous chapter presented the quantitative data analysis and discussed findings. In this chapter the findings of the qualitative data analysis, presentation and discussion are presented. This is done by presenting and discussing emerged themes emanating from the interviews conducted from Executive members from Metropolitan and Local district municipalities.

With consent of the interviewees, the interviews were recorded and transcribed. Transcripts were uploaded into electronic data analysis tool called Atlas.ti 7 (version 7.0.81).A tool was used that can accept textual, graphical, audio or video materials as input to be interpreted. Computer-aided techniques within the software were used to help categorise text and identify pertinent concepts and themes (Mawela, et al. 2017). In this analysis, five primary documents, namely P1, P2, P3, P4 and P5 from the interviews were considered.

Codes were created using open coding systems. Codes were further grouped into families of codes, each with the number of incidents (quotations) in each family of codes – Annexure M. A family of codes is a class of codes that relate to similar occurrences (Mavetera, 2011). Using the network viewer in Atlas.Ti, the relationships between codes and code families were found. The results of this process are shown as network diagrams. The network diagram also allowed researcher to group the codes and code families further into thematic areas. The following emerging key themes will be presented and discussed;

- Presence of website.
- Uptake and usage of ICT.
- Interventions to use of online services.
- Hindrance to use of online services.
- Solutions to hindrance of online services.
- Security measures.
- Services offered by municipalities.
- Advantages and disadvantages of ICT as part of e-governance.
- Staff buy-in and support.
- Citizen relationships.
- Strategies to improve online service delivery.

The Atlas.Ti tool was able to capture some theoretical insights as electronic memos. Mavetera (2011) explained that the memos are linked to both the quotations and the codes that they relate to. At the same time, the theoretical revelations or relationships amongst categories (codes) or memos can be shown diagrammatically using the network viewer (Mavetera, 2011). Figure 6-1 shows the Hermeneutic Unit with its components.

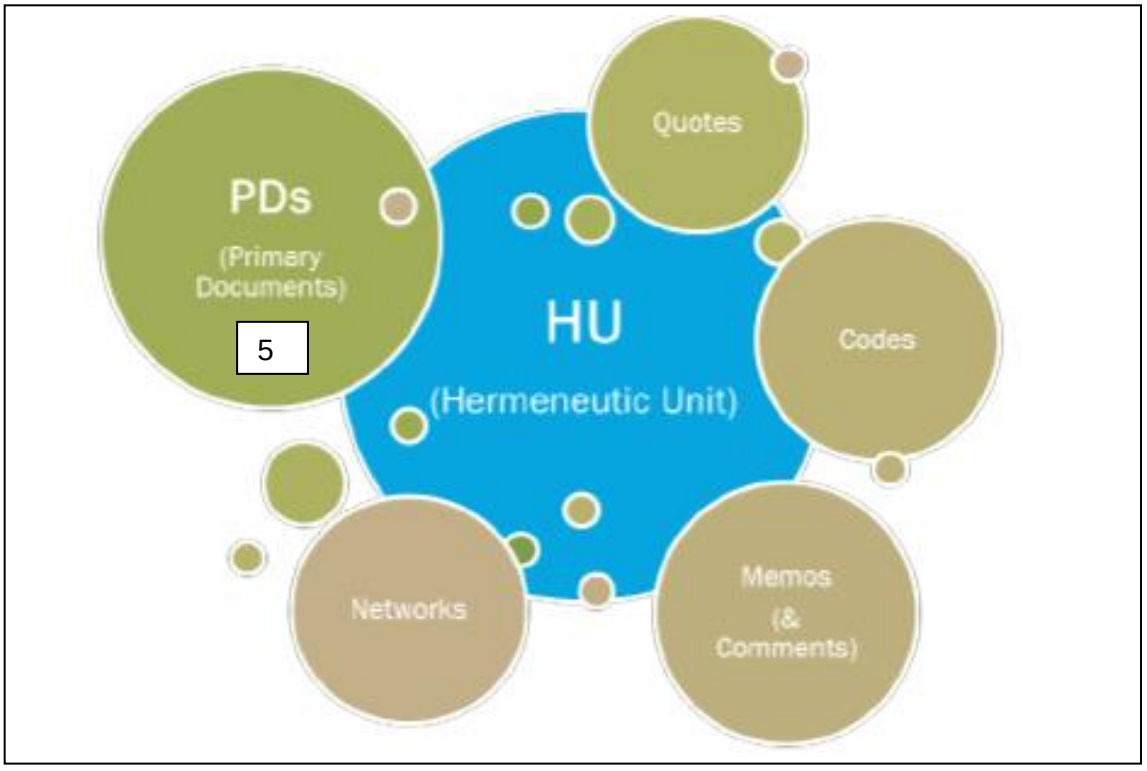

Figure 6-1: Hermeneutic unit with its components. Source: Patrova (2014).

6.2 Profile of interview respondents

Table 6-1 reveals a profile of interviewees who participated in this study. The interviewees were purposefully selected from their municipalities as they are the drivers of ICT and e-governance initiatives in their respective municipalities.

6.3 Research objectives, thematic areas and key sub themes

The purpose of this study was to address research questions posed in Chapter one and the research objectives thereof. The computer-aided techniques within the Atlas software were used to help categorise the text and identify pertinent concepts and themes (Mawela, et al., 2017). These themes and key sub themes were therefore linked to their related objectives as illustructed in Table 6-2. Discussion of each theme and their key sub themes is done under this section.

Table 6-1: Profile of interviewees.

Interviewee	Job Title	Department
P1	Web Administrator for e-Services Website	Application Development and Support Services
P2	Divisional Head	ITC applications
P3	Chief Information Officer	Information Technology
P4	IT Manager	Information Technology
P5	Chief Information Officer	Information Technology

Table 6-2: Research objectives, thematic areas and sub themes.

Research Objective	Thematic Area	Key Sub Themes
Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.	6.3.1 Presence of website	Static versus Dynamic website
		Usefulness of Website
		Users/Motivation for registering on Municipality website
		Interesting of information on website
Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.	6.3.2 Uptake and usage of ICT	Awareness of the advantages of ICT
		Building trust in the system
		Customer awareness
		Public participation
		Increase community literacy level
		Natural acceptance of ICT
Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa	6.3.3 Interventions in speeding online services	Availability of WIFI
		e-solutions
		Partnership
		Social media platforms
		Citizen Focus Service Plan
Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South	6.3.4 Hindrances to use of online services	Unavailability of free WIFI
		Computer Illiterate

Africa		Device incompatibility
		Poorly designed website
		Internet accessibility
		Obsolete equipment and applications
		Service providers
Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa	6.3.5 Solutions to hindrance of online services	Availability of Free WIFI
		Education and support
		Device compatibility
		User Friendly website
		Modernisation of ICT
		Renovation of website and application
		Public-Private-Partnership
		Security issue
		Invest in ICT
Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa	6.3.6 Security measures	Authentication and encryption
		Registration and passwords
		End point security
		Online transactions
		Trusted Software and Industry security standards
Assess and explain the services offered to citizens by local authorities in South Africa	6.3.7 Services offered by municipalities	Financial services
		Infrastructure services
		Social and community services
		Call centre services
		Walk-in Centres services
		Online services
		Smart cities
Assess and explain the services offered to citizens by local authorities in South Africa	6.3.8 Online services offered by municipalities	e-procurement and financial services
		CRM
		e-health solutions
		Properties
		Smart cities
Examine existing e-governance and e-	6.3.9 Advantages and	Advantages of ICT

government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa	disadvantages of ICT as part of e-governance	Disadvantages of ICT
Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa	6.3.10 Staff buy-in and support	Staff buy-in to e-governance
		Staff resistance
		Change management
Assess and explain the services offered to citizens by local authorities in South Africa.	6.3.11 Citizen relationship	Accurate information
		Communication
		Demonstrations
		Reliable e-services
Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa	6.3.12 Strategies to improve online service delivery	24/7 web service
		Communication infrastructure
		Political buy-in
		Public internet
		Managing relationships
		Remove corruption
		Modern technology
		Security issues
		Shared applications
		Skilled professionals
		Corporate governance ICT framework

6.3.1 Presence of website

This research applied the Siau and Long's (2005) Synthesized Stage Model to fully understand the stage of development for e-governance in South African municipalities. The findings from all the five interviewees indicated that their municipalities have website and therefore have passed the first stage of Siau and Long's (2005) Synthesized Model. The findings are congruent with Mawela's (2016) study who found out that all provincial governments in South Africa have operational websites. This study reveals that municipalities are however at various stage of e-governance growth depending on whether it is a metro or a Local district municipality. Onyancha (2010) share similar views with an evaluation of the South African government's website against the phases or stages of e-

governance development which indicates that South Africa is probably the only African country that is on the verge of attaining full e-governance status especially with the metro municipalities. The following comments illustrate presence of website in municipalities.

> *"Yes, we do we have a public website that display general information which is called http://www.joburg.org.za and then we have e-government, e-governance website it's an online website for citizens and it's called http://services.joburg.org.za"* P1

> *"Yes, we do have a website and by law I think all municipalities should have"* P3

> *"Yes, the municipality does have a website, the website is www.randwestcity.gov.za"*P5

Results of the study imply that municipalities in South Africa have functional websites, which provide information to its citizens.

6.3.1.1 Static and dynamic website

The United Nations (2010) observed that citizens benefit greatly from e-service delivery through improved access to information, improved interaction with government and more efficient government operations. Observations by United Nation (2010) shared similar view with the findings of this study that Metros such as City of Johannesburg have separate website dedicated for citizens *http://services.joburg.org.za*. The dynamic website is operating at interaction and transactional level with efforts towards transformation and e-democracy level as part of transforming municipality services. On the other hand, it became evident that Local district municipalities have static websites for disseminate information to general public. These findings concur with (Mukonza, et al., 2016) in their observation that other local authorities either have static websites or they do not have them at all.

In order to establish whether municipalities have active or static website, this study identified it by number of registered users on a particular portal for municipality. Quotations below were used to establish that.

> *"Here, we have got a website that is static, which do not require any registering and we use that for general communication"* P3.

Findings of the study is in agreement with Nath's (2005) Broadcast/Wider Dissemination Model which is based on dissemination of information through website relevant to better governance that is already in the public domain into wider public domain through the use of ICT and convergent media. Nath's (2005) explained that the rationale behind the model is that a more informed citizenry is able to better understand the governance mechanisms and

is more empowered to make informed choices and exercise its rights and responsibilities. The findings imply that local district municipalities are still at early stages of e-governance growth as they have presence of website which is static in nature which provides information to its citizens.

6.3.1.2 Usefulness of website

For citizens to keep on visiting a particular website, it should be useful, having current and relevant information. This section discusses various uses of municipality website. Al-Hujran, Al-dalameh and Aloudat (2011) suggested that government should make their websites more useful and usable. The findings of this study share same view with Al-Hujran, et al. (2011) who suggested that websites should be useful and usable which can motivate users to register on municipality website to access online services.

6.3.1.2.1 Communication

Findings of this study established that website for municipalities are used for communication. Results of the study share similar sentiments with Russell (2013) who argued that e-government has increased transparency, and enabled direct communication and access to information by citizens. Further confirmation of the results of this study comes from Russell (2013) who have acknowledged that communication between citizens and the government is made more easily available through online communication and feedback tools and through access to information and contact information for government departments and officials. Results of this study imply that municipality use their website to disseminate information and to get feedback from citizens. The following quotes highlight nature of communication which took place between municipality and its citizens.

> *"We use website as a means of communication and any communication that we feel it is relevant, we need to put it on the website we put it on the website as a means of communicating to the citizens".* P2

> *"Well, the website is actually for communication to the city, both on council matters and you know information that we wish our citizens to know. Council matters will be the publishing of your IDP which is the Integrated Development Plan, publishing of tariffs, publication of annual reports, performance reports, you know for the executive managers, all the information that is required by law to be done plus any other information that may be of value to citizens like all the municipality for the citizens to know'.* P3

The results of the study indicate that municipalities use their website to communicate important information to citizens in order to increase accountability and transparency in municipality operations.

6.3.1.2.2 Financial transactions

Styles and Tennyson (2007) in their study found out that larger cities and more affluent communities were more likely to provide financial information online. Results by Styles and Tennyson (2007) correlated their findings of transactional online financial information available in metro municipalities with Local district municipalities where statements and billing are offered online. The following statements support their findings:

"Customers will receive their statement almost immediately, there no delay with postal service. Customers can also view a history of statements backdated till 2012, should they require backdated copies. They can view your statement and manage your account online from anywhere in the world". P1

"it's just the statement, the billing side of things that's offered online. Information about tariffs is also offered online and static information like the times offices are open and all that". P3

"I think from a procurement point of view, I think we are in the planning stage in terms of introducing your e-procurement and I think those who are in business will be able to do their business online with the municipality". P5

The results indicate that citizens are interested in general information, financial information and bill payments when they access municipality website in metro municipalities. In Local district municipalities citizens visit municipal offices to get statements and general information as their websites are not yet developed to do online transactions, such as bill payments.

6.3.1.3 Users/Motivation for registering on municipality website

O'Donnell and Turner (2013) in their study noted that from August 2010, central civil service e-government portal for Korea was renamed Minwon 24. O'Donnell and Turner (2013) indicated that the Minwon 24 web portal has over 10 million registered users, or 20% of the population, though the system covers up to four times this number with each household needing to join to gain access to the services available on this system and this increases the coverage of this service to approximately 40 million Koreans. O'Donnell and Turner (2013)

explained that outcomes from this service include increased convenience for the public, enhanced cost efficiency and increased transparency. The findings by O'Donnell and Turner (2013) is in contrast with results of this study as the number of users who register to use municipality website is far less than the numbers stated in Korea as indicated in the quotations below. Results of the study indicate that metro municipalities have interactive or dynamic websites whereas Local district municipalities have static websites as highlighted in the following quotation:

> *"And currently we have got 328 520 customers who receives their water and electricity account by email on a monthly basis. So you can see from the amount of registered users and the people who receive their accounts by email the majority of those users make use of our e-services website together with the copy of our account or choose how you like to receive your account either via Postal, email or MMS". The City of Johannesburg maintains a website on the Internet called (e-Services Website), the purpose of which is to provide a facility for citizens to access online services".* P1

> *"I think about 40% of our users, in fact most of our users are registered there. I am not sure about the stats but we have about 23 to 26, 26 0000 account holders and most of them are registered in that website because they can now view their electronic statements and it's different from the normal Lesedi one which is specifically for electronic statements".* P3

> *"So I think the number is close to 600 users".* P5

The findings from these quotations clearly indicate which municipalities have an interactive and transactional website and which ones offer a static website. Those respondents who provided an exact number of users registered with the municipality, without estimating are the metros municipalities as they keep track of their users. On the other hand, those who are not sure of the exact number of users are from Local district municipalities with the static website.

The analysis of these results assist to identify best practices where e-governance in municipalities is doing well so that lessons could be drawn that will assist to develop e-governance framework for municipalities in South Africa. This framework is discussed in the next chapter.

6.3.1.4 Interesting information on website

Welch (2012) expressed that the release of timely and accurate information on website about municipality operations allows external observers to determine whether government is operating within acceptable parameters. “Transparency enables citizens and other stakeholders to watch government and, if transgressions are identified, challenge it through the media, courts or other institutions” (Welch, 2012). The findings concur with Welch (2012) findings which are supported by the following quotes.

> *“Customers can also submit a query online and we also have a HOW DO I? facility. Basically, like a frequently asked question is made available to answer possible questions asked for the citizens. This facility for instance when we receive stats is one of the top application used for customers to gather information”.* P1

> *“So the website coves information that relates to the activities in municipality, which covers the activities by Mayor that covers information that citizens might require relating to how they access municipal services”.* P2

> *“…generic information in terms of the useful documents of the municipality ranging from compliance documents to financial compliance and different policies around the municipality”.* P5

Citizens can therefore submit their concerns about services delivery from municipalities through their website instead of visiting their offices.

6.3.2 Uptake and usage of ICT

6.3.2.1 Awareness of the advantages of ICT

Asgarkhani (2012) explained the benefits of e-governance, which include providing expedient government services to citizens and businesses, improving the economy, allowing for greater public access to information, empowering citizens, and making the government more accountable to its citizens. The observation by Asgarkhani (2012) supported the findings of this study in that citizens should be made aware of the advantages associated with ICT as a way of encouraging them to uptake and use ICT tools. Further confirmation of the results of this study comes from Bwalya (2009) who noted that low levels of awareness are often a major problem with e-government services. Mpinganjira, (2012) shared the same sentiments with results of this study as he outlined some of the challenges which affect diffusion of e-governance initiative as lack of awareness of available e-government services

and lack of trust in government's ability to provide secure e-service environments, as well as poor quality of e-services provided by government. This is supported by the following quotes.

"I think they must be shown what the advantages are. I think if they are made aware of the advantage of using e-government services are reduced costs, efficiency, better record keeping, convenience they would generally be convinced that it is better to use those services. Yaah, I think those are the main things, is the awareness of those advantages". P2

"Well, I think the most important thing will be to communicate, make people aware". P4

The findings imply that without citizens' awareness of the advantages of using ICT as part of e-governance there will be low usage and uptake of ICT by citizens.

6.3.2.2 Building trust in the system

Bolgherini (2007) explained that citizens who have certain cultural views or have a mistrust of government or technology may not be inclined to use e-government services. Their opposition toward the adoption of e-government is derived from mistrust in technological change that requires the use of computers to receive services normally received from direct human exchanges (Bolgherini, 2007). Many citizens are more comfortable interacting face-to-face with a person than they are with using a computer and if citizens have negative feelings about the government in general, their feelings are less likely to improve just because the government is now providing services in an automated format (Bolgherini, 2007; Horsburgh, Goldfinch, & Gauld, 2011). Mpinganjira (2012) found out that lack of skilled people in government often results in people having doubts as to their ability to deliver reliable and secure e-services. Results of this study concur with Bolgherini (2007) observation in that resistance of citizens not to make payment through online systems is because they don't trust the system as it is open to identity theft, fraud and cyber-crime. The following quotations share the same sentiments.

"…communicating to people, by giving them technology. That is as I said easy for them to use that make sense by ensuring that they have trust in the system and giving them the assurance that the systems that we are using are safe especially when it involves their money". P3

"The issue of transaction or payments using online system is a generic one because it's open to fraud and all that kind of thing so we need to be able to get the people to trust that the platform that we are providing them is secure when we do allow them to

use to transact online. At the moment we are not having that transaction but it's quite a big issue because also it involves many actors you know the banks, you get the people that do the payments or payment service providers". P3

"I think constant communication with the communities, interfacing with them, pushing this particular service to them and mostly importantly getting feedback from them and if within whatever various platforms that would have been made available to the communities". P5

The results of this study imply that building trust in the system encourage citizen to do online payments which is guaranteed through tight security measures which are put in place by municipalities.

6.3.2.3 Customer awareness

Bwalya (2009) pointed out that the focus in e-government projects is often given to ensuring the availability of the services and little effort is made to ensure that people are aware of the services. Mpinganjira (2012) recommends that government make use of mass media to inform people of government services available online as well as the benefits of e-government services. This study share similar sentiments with Bwalya (2009) and Mpinganjira (2012) as municipalities uses various means to make customers aware of the online services offered by municipalities. Interviews express the following sentiments;

"Ok, the customer awareness by having road shows, Media, Television, Radio, Advertisements" P1

"We have advertisement on papers, also we send SMSs. So, I think we were quite successful and the response was good in people taking up, you know the use of that website and so we have done the promotion you know the SMS via, the statements, the printed statements and also publishing on our static website and also on the newspapers". P3

"I think as and when you begin to communicate more about these things and we need to take advantage of the existing social media platforms which have revolutionalise the digital space, slowly, slowly I think people will begin to buy into that". P5

6.3.2.4 Public participation

Mametja (2015) hold that the introduction of e-participation, citizens' portals, councillor portals and e-communication programmes to accommodate those that may not be able to

attend public participation meetings in person but would like to actively participate in the affairs of the municipality is necessary. The observation support the results of this study and further confirmation of the results of the study comes from Ganiyu, Oluwafemi, Abayomi, Olusegun and Salihu (2017) who concluded that the adoption of e-governance within the public sector has become imperative in enhancing public participation, to observe and assess government projects, safeguarding government accountability and transparency, as well as transmitting information among the citizens', business community, and government. The following is the quote which supports the above discussion.

> *"What we could have here, I think we are trying to push public participation to be online interactive session of some sort, where people would begin to interact more with the municipality at that particular platform. And also the issue of people having to escalate their Service delivery frustration and issues in that and instead of them having to call the municipality come and queue at two different service points".* P5

Further confirmation of the results of this study comes from O'Donnell and Turner (2013) who noted that e-government initiatives aim to improve government–citizen relations and they include facilitating access to information about government policies and enabling citizens to access services without having to engage with multiple agencies. O'Donnell and Turner (2013) reaffirmed that the aim is to connect a series of government functions together in a seamless manner and that services may be delivered to citizens through a variety of channels (online, government office front counter, call centre) requiring coordination between government agencies to ensure consistency in the messages communicated to citizens.

The results indicate that municipalities are putting in place public participation platforms which offer a variety of channels to promote citizen engagement and participation.

6.3.2.5 Increased community literacy level

This study found out that community literacy level is a key determinant of the uptake and usage of ICT tools by community. The results of this study reveal that municipalities need to put in place structures that educate community ICT skills so that they can understand how to use ICT when accessing municipal services. The following quotation reveals the importance of increasing community ICT level.

> *"I think much has to do with the level of literacy in the community out there. To basically say I am just saying generally talking about ICT literacy. There are really structural issues that we need to really overcome as a community before we can drive*

people away". P5

The findings indicate that an educated community has a high level of ICT usage and uptake and therefore municipalities should take initiative to educate its citizens if the implementation of e-governance is to be successful.

6.3.2.6 Natural acceptance of ICT

This study establishes that Africans are adopters of technology, although some are at different stages of adoption. Those who first adopt technology are the early adopters and those who took time to accept and use technology are the laggards. The following quotation expresses the sentiment by one interviewee.

"I think in Africa we are lucky position Gibson in that ICT uptake have been a natural thing and it has evolved. I think the statistics said in terms of the quick uptake of technology and it has happened quite a lot in Africa and it have help us to sought of leap frog in terms of you know being able to digital inclusion and so on". P3

The findings indicate that Africans have appreciated technology and they are naturally accepting it without anyone teaching them of such technology.

6.3.3 Interventions in speeding online services

Kohlborn, Weiss, Poeppelbuss, Korthaus, and Fiet (2010) established that increased adoption of the online channel by government has been mainly driven by the need for increased efficiency, cost effectiveness and customer satisfaction in the delivery of public services. This study identified interventions in place to speed up online services by municipalities.

6.3.3.1 Availability of WIFI

In order to increase the uptake and usage of ICT tools by citizens as part of e-governance, municipalities are taking initiatives of rolling out free WIFI. The free WIFI is available in public hot spots whereby citizens are required to register to access the WIFI. The following quotations share similar sentiments.

*"There is also Smart WIFI, email and other Online Services offered".*P1

"So the key to that is for the municipality for whatever possible to provide free WIFI to citizens". P3

The findings imply that rolling out of free WIFI will assist disadvantaged communities to have access to internet and be able to access online services offered by municipalities.

6.3.3.2 e-solutions

6.3.3.2.1 Application for indigent

Local communities have to benefit from online services offered by municipalities. Municipalities are therefore developing various applications that assist indigent citizen in accessing these online services. The following quotation supports this statement.

> *"…as well as an app that we have developed to register indigent citizens who are entitled to intended benefit. We use app to register citizens and to be able to track their applications".* P2

Results of this study imply that municipalities are putting people first by coming up with applications which help indigent citizen to access municipal online services.

6.3.3.2.2 Payment channel

Municipalities are trying by all means to maximise its revenue collection by making payment channels available to its citizens. Results of this study established that various online payments channels are made available especially in metro municipalities where e-governance growth is at advanced stage. The following quotations highlight various online payment channels available;

> *"We have also developed a payment channel for bill payment, electronic bill presentment and payment we call it EsiaKoca that also enables citizens to be able to request their bills, view them and pay them on a web portal or via a mobile device".* P2

> *"The financial system we are using currently is winsoft, now what winsoft is doing as add on to the service they are creating a centralised website portal so that everybody who is within the municipality and use winsoft could be able to log on to do the enquiry, do request does some changes so it is on the development".* P4

The findings indicate that municipalities are coming up with various applications for payments. The applications encourages citizens to settle their bills as they no long spend their time in queues to make payment for their bills, instead any payment is being done online. This applies mainly to metro municipalities whereby web portals are available for payments. In Local district municipalities citizens are still visiting municipal offices to make

payments.

6.3.3.2.3 e-statement

Findings of this study establish that Local district municipalities do not have applications that support transactional activities such as online payment channels. However there are applications which are available which allow citizens to view and print their statement. The interviewees have this to say;

> *"we have different apps in there and we will be looking at e-statement and how do we share data with citizens and you know an app for instance that would give information about what's happening around Lesedi and so on".* P3

> *"And part of it was that e-statement but we want to integrate that to make our static website to be more interactive".* P3

> *"The financial system we are using currently is winsoft, now what winsoft is doing as add on to the service they are creating a centralised website portal so that everybody who is within the municipality and use winsoft could be able to log on to do the enquiry, do request does some changes so it is on the development". P4.*

The finding imply that Local district municipalities are much interested in providing e-statements to their citizens whereas in metro municipalities it provides a platform which allows citizens to make payments online.

6.3.3.2.4 e-health

Initiatives of trying to transform the health system in Africa are growing. The World Health Organization (2016) defined e-Health as the use of information and communication technologies (ICTs) for health. Kiberu, et al.(2017) highlighted that e-Health is among the building blocks upon which modern health sectors are built. Kiberu, et al.(2017) indicated that e-health involves combined use in the health sector of ICTs for learning, research, data acquisition, surveillance, storage and access to patient data and clinical care even at a distance. In developing countries, e-Health solutions have the potential to improve health through enhancing capacity of the health workforce, especially where traditional means are lacking (Kiberu, et al., 2017). These initiatives concur with what is happening in metro municipalities in South Africa in promoting e-health as indicated in the following quotation.

> *"We developed other electronic services via our e-health solution that enables citizens to be able to book for their clinic visits, to check for their medication".* P2

Findings of this study indicate that metro municipalities are in a drive to promote e-health solution so that citizens are able to book appointment to see doctors online or to check for the availability of medicines.

6.3.3.3 Partnership

Mpinganjira (2012) hold that partnership with reputable Information Technology companies is important in that it allows government access to their highly skilled IT personnel. The findings of this study however agrees with Mpinganjira (2012) on partnership and however differs in who to partner with. This study found out that municipalities should partner with banks and government departments in order to gain trust from citizens. Paulo (2016) moreover believe that e-governance requires commitment of resources, willingness and engagement among the government, private and public sectors (Paulo, 2016) which is in agreement with the results of this study. This is supported by the following statements from the interviews.

> *"Also that we partner with banks and in order for the citizens to have courage and trust that they can do at online we are a little beat on the behind side".* P3

> *"I think largely owing to the fact that it's not necessary our core mandate but we hoping to basically partner with departments like e-government and then look at the offerings they are doing and then check as to what is the possibility of replicating that at our local space".* P5

The findings indicate that banks and government play a key role in facilitating online services between citizens and municipalities.

6.3.3.4 Social media platforms

Hand and Ching (2011) examined the use of social media by local governments in the Phoenix metropolitan areas and found that using social media at the local level government level seems to offer promise of increased citizen engagement, reaching citizens on a common platform, and allowing for citizen comments. Graham, (2014) argued that social media usage enhances governments' ability to interact with and engage citizens. Graham (2014) further aurgued that this more open form of government public relations that social media usage provides is particularly beneficial to local governments, as it is the local level of government where citizens often feel the most direct access and potential importance in governance. These findings are congruent with an interview participant remarked;

"I think we are encouraging them to use technology and more specifically on social media platforms that are there. We also have a presence within those social media platform so I think we largely encourage that but I think part of the limitation is that we don't have many of those e-government initiatives that we are driving from local level". P5

It implies that citizens have to be encouraged to use social media and local government should take the initiative in promoting that. Studies by the Pew Research Center (2010) found out that nearly one-third of online adults report using online social media sites to get information about government agencies or officials. Mawela (2016) found that all municipalities have websites and four of the eight municipalities have specific links on their website to social media tools. It therefore indicates that municipalities are putting effort to promote social media as a tool for effective communication which will ultimately promote the uptake and usage of ICT. This discussion is in line with objective 1 of this study.

6.3.3.5 Citizen Focus Service Plan

Findings of this study concur with Kamblet (2003) who assert that ICT initiatives deal particularly with the relationship between government and citizens and that citizen has a dual role to play namely: a stakeholder and as a consumer of the services offered by the government(Kamblet, 2003). Colesca and Dobrica (2008) further observed that governments must become citizen-focused to ensure that e-governance will succeed. Interviews express the following sentiments;

"The purpose of the e-Services channel is to minimize the interaction with the call centre and facilitate and offer another channel to the citizens of Johannesburg to interact with the City of Johannesburg (CoJ)". P1

"we have got a master system plan which we have done which really talks about Citizen Focus Service Delivery. So there are specific things that we are looking at in the implementation of the master system plan". P3

"I must say that there is no specific policies around e-governance but we would like to put those in future". P3

The results indicate that municipalities have in place Citizen Focus plan in their strategic documents in the form of Citizen Focus Service delivery with the objective of increasing the relationship between government and citizens.

6.3.4 Hindrances to use of online services

6.3.4.1 Unavailability of free WIFI

Results of this study found that in as much as citizens would like to access online services from their municipality, there is a challenge of unavailability of free WIFI and given that the cost of data is high and few people are able to afford it. The following quote support that;

> *"So the key to that is for the municipality for whatever possible to provide free WIFI to citizens".* P3

The findings indicate that without free WIFI, citizens will not be able to take and use online services made available by municipalities.

6.3.4.2 Computer illiterate

Subban, Nzimakwe and Pillay (2007) revealed that in a quick-changing society like South Africa, is not enough to be able to read and write anymore and therefore every public servant needs to be computer literate. Subban, et al. (2007) explained that a key challenge that government faces is how to improve the information literacy skills of its public servants and all its citizens. Their revelation share similar sentiments with the respondents interviewed during this study.

> *"The biggest, biggest challenge is that the majority of our citizens are not computer literate".* P2

> *"I think it basically drive us to a point that as and when people become ICT literate I think they would be a huge expectation in terms of us improving those business processes and it means that we would have to invest more resources in making sure that our resources are able to match that demand moving forward".* P5

The results indicate that rolling out of ICT as part of e-governance in municipalities could be successful if both public servants and its citizens are computer literate.

6.3.4.3 Device compatibility

Mbatha and Lesama (2013) in their study recommend that network facilities and computers should be upgraded regularly, so that they can become compatible with new applications and technology. Respondents participating in this study share similar sentiments.

"Secondly, the other major disadvantage is that while a lot of services can now be accessed

via the mobile devices and so forth, not many of our citizens have got smart phones so they are mostly reliant on USSD type of phones which unfortunately cannot support the kind of applications that we develop". P2

> *"Ok, I think you know the first one is whether people have access to the internet, that's big one for majority of our clients. And if they do have access whether the devices they got they will be able to locate that information in the format that is user friendly and that you can have so thus the first part".* P3

Results of the study indicate that not all citizens have a smart phone to access the internet. Therefore citizens are limited in accessing municipality services through such devices.

4.3.4.4 Poorly designed website

Subban, Nzimakwe and Pillay (2007) established that one of the most critical problems that the web and the users face is information overload. This observation agrees with the findings of this study as website for Local district municipalities are not user friendly and some with outdated information and dead links. Further confirmation of the results of the study comes from Paulo (2016) who noted that websites are often limited by problems related to usability, language (inadequate translation, unfriendly user language), lack of credibility in the message conveyed, lack of or irrelevant information and difficulties in getting the information or services needed, among other issues. Interviewees express the following sentiments;

> *"...develop a website that will be friendly to all types of devices including the ones that are, you know not like your smart phones but the normal phones and the other thing that hinders the online use of services is if your website doesn't learn itself to be user friendly so you need to really understand what you need to do for usability of your system into will be user friendly".* P3

> *"I think mostly it's the stalling information that we would ordinarily find there. In that most of the time is that number of municipality websites are just poorly designed that sort of things you know. I think from a brander point of view, I think you agree with me that if you visit a bad website I think the chances of you going back there they are quite very less. So I think that becomes part of the problem".* P5

The findings imply that for municipality to increase the uptake and usage of ICT by citizens, municipalities must design website with friendly user languages which is understood by citizens, with credible message and relevant information.

6.3.4.5 Internet access

Abrahams and Newton-Reid (2008) observed that internet penetration is low due to high access prices relative to income and broadband Internet is priced out of the range of the vast majority of households. Proposals to create a municipal broadband market in order to promote affordable high-speed data access are not yet implemented. Mbatha and Lesama (2013) in their study recommends that money should be set aside for the purpose of increasing bandwidth to provide a speedy, reliable and consistent Internet connection. Their observation and recommendation support the results of this study as internet access is a challenge which requires investment. This is supported by the following interviewees' quotations:

> *"The last reason for me that I think is major throughout the country is internet connectivity".* P2

> *"…is access speed is the problem".* P4

The findings imply that internet access is key in promoting the uptake and usage of ICT tools as part of e-governance.

6.3.4.6 Obsolete equipment and applications

Seckel (2010) established that the ageing of the public service workforce and ever-present fiscal pressures are creating a stronger imperative to modernize government operations through innovative applications of technology. The results of this study support Seckel's (2010) observation that ageing in terms of equipment and application can affect the implementation of ICT initiatives as part of e-governance. Sebastian and Supriya (2013)have acknowledge that rapidly changing technologies and the high cost of new technology makes it difficult to build an efficient telecommunication infrastructure. Sebastian and Supriya (2013) expressed that the existing technologies become obsolete fast and it makes the developing countries lag behind their developed counterparts on world index. This sentiment is expressed in the following quotations:

> *"Currently, the website and the internal applications are faced with various challenges calling for the modernisation of this environment. The current platform has become old and outdated which cause the site to go down frequently".* P1

The findings indicate that municipalities should move with time in terms of equipment and application so that online service delivery to citizens could be efficient and effective.

6.3.4.7 Service providers

This study found out that municipalities are not working alone in providing online service. They are doing this with the help of different service providers in rolling out free WIFI and to provide platforms for payments to citizens. Municipalities therefore rely on these service providers in providing WIFI. The following are the sentiments from the interviewees;

> *"Although as a city we are busy rolling out WIFI, free WIFI, and we are trying to make it cover as much foot print as possible. We still find that firstly, it's intermittent itself because we always rely obvious on the service providers. But secondly, to cover, it's not available we can't cover all areas that require that service".* P2

> *"The issue of transaction or payments using online system is a generic one because it's open to fraud and all that kind of thing so we need to be able to get the people to trust that the platform that we are providing them is secure when we do allow them to use to transact online. At the moment we are not having that transaction but it's quite a big issue because also it involves many actors you know the banks, you get the people that do the payments or payment service providers".* P3

The findings indicate that banks and various internet service providers play a role in promoting the uptake and usage of ICT tools as part of e-governance by proving a channel for payment system by citizens and in rolling out internet connectivity to citizens. Municipalities are sometimes limited in controlling those service providers and therefore cannot deliver to the expectations of citizens.

6.3.5 Solutions to hindrance on online services

6.3.5.1 Availability of free WIFI

This study established that availability of free WIFI through public hot spots promote the uptake and usage of online services offered by municipalities. This is due to the fact that South African data is still expensive and few people can afford it as compared to the one in developed countries. The interviewees have this to say;

> *"It can be quite a difficult responsibility for the city because we don't necessarily have the right skills, we don't necessary have the funding to do that but if we bring in the private sector and the private sector can be able to also realise some benefits out of that investment, then I think that would be a win-win situation that address the broadband issue, the network issue".* P2

"Where the private sector is encouraged to come and built infrastructure network infrastructure that will enable the full coverage of broadband across the city". P2

"free WIFI, usability and easy access across all devices". P3

"Internally, GBN (Gauteng Broadband Network) is being implemented that will help people internet access via a very fast line". P4

"Because from a technical point of view one would still have to argue and then say that the issue of access broadband also plays a critical role in that to access this services is not necessarily be free so one need to have data to do that. So I think as government we have noted that the initiative that Gauteng Broadband Network is doing in terms of laying Fibre out there with the ultimate goal of really making broadband available to Communities out there". P5

The findings of this study imply that availability of free WIFI through government initiatives and other players can help to implement a broadband network which covers a wide geographical area which can benefit citizens at large.

6.3.5.2 Education and Support

More educated and technology-affluent members of any society get greater access to any ICT-related initiatives, while the underprivileged segment of the population does not enjoy similar access. Results of this study found out that education and training plays an important role in promoting the uptake and usage of ICT as part of e-governance. Further confirmation of the results of the study comes from Mundy and Musa (2010) who agreed that e-government officials need to pay attention to the cultural factors affecting e-government adoption, and provide training that will lead to wider acceptance of e-government initiatives. Interviewees express the following;

"As far a computer literate is concerned, yaah, that is a tough one because, although a lot of the older people now are even, I think technology itself its evasive, it will penetrate no matter what, because I know like initially some people like older people I know will be quite reluctant to use phone but now they use whatsapp since its quite common and now they use whatsapp they understand whatsapp and they do that and it penetrates by itself but also and probably partner with other software companies and or mobile companies to try and educate people around just being able to find their way around these devices so that they are comfortable, they are more confident about how and that can be encouraged". P2

This study also found out that local governments use social media tools to connect with citizens such as Facebook and Twitter and other media like televisions. One of the participants has this to say;

> *"It can be even encouraged over different types of media like Television can be a way that can be used to educate people. I have seen some technology programmes on the T.V where they show the basic ways of how to send a message to somebody, you know, those kinds of campaigns. And slowly I think that could improve literacy of the population"* P2

Findings of this study indicate that education and support can be done to citizens through various media in understanding aspects of e-governance.

6.3.5.3 Device compatibility

From the quantitative survey results, this study established that citizens use various devices to access internet. However some of these devices are not compatible with municipal applications and therefore requires smart phones to be able to access services which are offered online by municipalities. One of the interviewee has this to say

> *"As far as the use of devices is concerned which is the use of smart phones, to me I think that's evolution and I think with time these devices will start to be more affordable. I can already see there are a lot of devices coming out of places like China where they are starting to the push prices down and they are starting to come within the affordable range of people".* P2

Findings of this study indicate that smart phones are still expensive for the citizens. This implies that some smart phones have to be imported from other countries which could be affordable to the majority of citizens.

6.3.5.4 User friendly website

Mpinganjira (2012) established in his study that the ease with which people are able to navigate e-government sites, the kind of support available online, comprehensiveness, reliability and up-to-datedness of information are factors that are closely related to service quality perceptions. The observation by Mpinganjira (2012) concur with the findings of this study whereby the respondents through interview highlights that free WIFI and usability and easy access to internet is of paramount importance for the successful implementation of e-governance. This is supported by the following quotation;

"…free WIFI, usability and easy access across all devices". P3

The study indicate that easy access to internet promote the uptake and usage of ICT by citizens in accessing online services offered by municipalities.

6.3.5.5 Modernisation of ICT

This study found out that municipalities can enjoy the benefit of using ICT in improving service delivery through modernisation of ICT by keeping abreast with changes in technology. The study also established that there are some benefits associated with modernisation of ICT as indicated by one of the respondents in the following quotation below;

> *"The e-Services website is part of the modernization project currently underway. And the Project's objective will improve Information efficiency, Reliability, Accuracy, Real-time information access; and achieve a defined level of competencies while building and sustaining an end-to-end ICT platform solution. It will also improve understanding of how business processes are implemented in these Applications"* P1

Results of his study indicate that improves information efficiency, reliability, accuracy, real-time information access, high level of competencies, improved business processes is achieved through modernization of ICT.

6.3.5.6 Renovation of website and applications

Paulo (2016) who explained that websites are often limited by problems related to usability, language (inadequate translation, unfriendly user language), lack of credibility in the message conveyed, lack of or irrelevant information and difficulties in getting the information or services needed, among other issues. Municipalities are making efforts to renovate their website and applications so that it becomes usable with relevant information. One of the interviewee expresses the following sentiment;

> *"There is a project currently running and is aimed at renovating and extending the current website and applications into a new technology to best support the needs of the business"* P1

Results of this study indicate that municipalities has to invest in renovating its website and applications in order to get the full benefits of using its websites to deliver services to its citizens.

6.3.5.7 Public Private Partnership

Kamblet (2003) hold that e-governance and ICT initiatives deal particularly with the relationship between public departments and other institutions - other Government departments, private sector service providers, non-profit and community organizations, and relationship between civil society institutions. Findings of this study share similar sentiments in believing the importance of private-public-partnership for successful implementation of e-governance. Mamaghani (2010) also talks about the importance of public-private-partnership for an efficient ICT project implementation. Interviewees express the following sentiments;

> *"I will start with the internet connectivity one because I think to me it's a foundational problem. I think that they must be some kind of Private-Public-Partnership. Where the private sector is encouraged to come and built infrastructure network infrastructure that will enable the full coverage of broadband across the city. And in turn maybe, the city should give for that in return give the land on which those that infrastructure is constructed for free. So there is win-win situation because for the city alone to roll out fibre on it's on and maintain it by the way, the maintenance is quite an issue as well".* P2

> *"I think one would be issue of a partnership with sister departments like the department of e-government and also with private sector in really pushing this".*P5

The findings imply that municipalities on their own cannot be able to provide the necessary broadband due to high costs. Municipalities therefore require sharing cost through Public-Private-Partnership and given that municipalities lacks some skills which might be required to roll out fibre for internet connectivity.

6.3.5.8 Security issues

O'Donnell and Turner (2013) in their study found out that initiatives such as e-Seoul allow citizens of Seoul in Korea to use mobile devices to access public services 'anytime, anywhere'. O'Donnell and Turner (2013) highlighted that website of Seoul provides a privacy policy that is accessible on every page and that accepts data and addresses the use of cookies or web beacons to track users. The results of this research indicate that municipalities in South Africa are putting effort on security measures, although it is not at high level as is seen with e-Seoul security measures. Further confirmation on the results of this study on the issue of privacy and comes from Hughes (2012) who warns that while e-government enhances service delivery, it equally enhances surveillance capability over citizens in society. In addition, electronic communication, such as e-mail, is recorded and

can be traced far more easily than ordinary mail. One interviewee highlighted that security should be tight in order to protect citizens personal information.

> *"Also another big thing there it should be aware of but it's more of us internally to do good is the security around these things"* P3

> *"There is issue around also security, we need to be sure that security is cool and not only end-point but the wide area network security and Apps security"* P3

The results indicate that for citizens to be able to use and uptake ICT, security issues need to be addressed by municipalities.

6.3.5.9 Invest in ICT

Bearfield and Bowman (2016) argued that despite the growing interest in transparency, it is reasonable to assume that less-resourced cities would attach a lower priority to placing information online. Bearfield and Bowman (2016) highlighted that given real constraints imposed by fiscal stress, we expect cities with sufficient resources to be more resilient and, therefore, have a greater commitment to transparency than less-resourced cities.

Zawada, Wallmach, Ngcobo and Mabule (2007) observed that ICTs are considered to be both direct agents of development and also facilitators of integration, which, in turn, are likely to promote socioeconomic development. Zawada, et al. (2007) asserts that many countries, both developed and developing, are investing in ICTs to improve their lifestyles and business practices. The South African government has placed a strong emphasis on ICT-sector development through the implementation of a national ICT strategy, which proactively addresses ICT penetration, particularly for disadvantaged segments of society (Zawada, et al., 2007). This observation by the above authors is in contrast with the results of this study as interviewee feel that municipalities are not giving enough budget to ICT. The following quotation supports that;

> *"If we have got available budget we can buy the skills. If we don't have the budget it's a problem".* P4

The results indicate that ICT initiatives are facing challenges due to budget constraints and there is need to invest in ICT for its successful.

6.3.6 Security measures

Subban, Nzimakwe and Pillay (2007) likewise described that governments will need to protect their information and systems from breaches of computer security that threaten not only the integrity and availability of services, but also the confidence of users and the general public in the system. The following subsections correlates with observation by Subban, et al. (2007).

6.3.6.1 Authentication and Encryption

Kroukamp (2005) contends that security in e-government includes protecting systems and data from hackers and viruses, ensuring the integrity of electronic records, preventing the interception or falsification of information and being able to control the authorised sharing and disclosure of information. Kroukamp (2005:56) share similar sentiments with the results of this study when it established that municipalities are very careful about fraud on internet through various authentications at various levels. Interviewees express the following sentiments;

> *"When the system uses the information it is encrypted and passed through to the various systems currently available on our e-services".* P1

> *"Ok, we obviously are quite very careful about fraud on internet. And to curb the risk of those incidence, we ensure that we put sufficient authentication in place. And we ensure that we secure all our transactions as much as possible. So in some cases like on the EsiaKoco channel, we ensure that we have got 3 factor authentication that make sure that a person's information is only unique for that person and is known to that user".* P2

> *"The issue of transaction or payments using online system is a generic one because it's open to fraud and all that kind of thing so we need to be able to get the people to trust that the platform that we are providing them is secure when we do allow them to use to transact online. At the moment we are not having that transaction but it's quite a big issue because also it involves many actors you know the banks, you get the people that do the payments or payment service providers".* P3

> *"I think there are industry specific authentication methods that are basic the more especially when people have to process issues of payment within that thing".*P5

The results indicate that citizens' personal information is vulnerable to security threats such

as identity theft and fraud if proper security measures are not in place.

6.3.6.2 Registration and Password

Mundy and Musa (2010) in their study found out that in as much as obtaining feedback is crucial, the government must guarantee the privacy and security of information provided by individuals. The study by Mundy and Musa (2010) confirmed the results of this study of security measures such as registering of users who login using username and password is in place for municipalities. The following quotations for assert to that;

> *"Our e-Services website is password protected - Users who logon to the e-Services website requires a username and password".* P1

> *"Ok, currently when users register online to get access to our e-services, they provide certain personal information when they register".* P1

> *"There is always a problem, but on a new website you won't just get access you have to register we have to verify your registration before you get access".* P4

Findings of this study indicate that citizens gain confidence with municipality systems if their security concerns are guaranteed which can come in the form of username and passwords.

6.3.6.3 End point security

This study established that citizen information is vulnerable to some security threats and therefore municipalities are putting various measures in place such as secure socket layer. The following quotations indicate some of these measures.

> *"We currently have Secure Socket Layers (SSL) is party used on the e-Services website under the Accounts by e-mail section".* P1

> *"Internally, first of all for our security we have done security assessment and we have got security best looking at both our internal security and website security and they have come up with recommendations, this is just general security of the website and the environment here, we have come up with recommendations which will be implemented. However, we have got end point security, we have got service security, we have got firewall securities and all those normal things that we do".* P3

The findings imply that authentication, encryption and end point security are fundamental for the successful rolling out of ICT initiative if citizens are to increase their usage and uptake of

ICT. These findings address research objective1.

6.3.6.4 Online transactions

Chaterera (2012) in her study found out that participants expressed a general lack of trust in using online transactions, particularly in financial transactions or those that involved sensitive documents. Chaterera (2012) indicated that if security and privacy are not guaranteed, citizens will tend to distance themselves from using e-government in fear of invasion of privacy and misuse of the information they provided. These security concerns were also raised in this study as highlighted in the quotations below.

> *"Ok, currently when users register online to get access to our e-services, they provide certain personal information when they register".* P1

> *"The issue of transaction or payments using online system is a generic one because it's open to fraud and all that kind of thing so we need to be able to get the people to trust that the platform that we are providing them is secure when we do allow them to use to transact online. At the moment we are not having that transaction but it's quite a big issue because also it involves many actors you know the banks, you get the people that do the payments or payment service providers".* P3

These findings imply that security measures are being put in place in metro municipalities where they are transacting online, whereas the Local district municipalities are not yet transacting online on a full scale basis.

6.3.6.5 Trusted Software and Industry Security Standards

Mutula and Ocholla (2010) expressed that e-government must ensure that government processes and services observe the law and maintain their integrity in satisfying citizen needs through the delivery of relevant, value-added and high-quality services. Their findings agree with the following comments;

> *"So we need to be able to show that we are using the trusted people and with trusted software like you know have certificates and all those things".* P3

> *"I think we are really guided by industry security standards to really make sure that the traffic that would be on our website is quite secure to do business as far as bank services".* P5

The results imply that laws should be able to protect citizens through the use of trusted

software which is guaranteed by the industry security standard.

6.3.7 Services offered by municipalities

This study found out that municipalities offer three different kinds of services, namely financial services, infrastructure services and social and community services. Table 6-3 highlights such services.

Table 6-3: General services offered by municipalities.

Financial Services	Infrastructure services	Social and community services
Payment of bills	Roads	Health services
Taxes,	Water	Police services
Rates	Energy	Emergence services
Licencing of vehicles	Electricity	Libraries
	Waste	Security
	Parks	Land evaluation
	Grave site	Swimming pools
	Land	Roads safety
	Sewage	
	Roads	

6.3.7.1 Call centre services

In its research report on call centres, the Union Research Centre on Organisation and Technology (URCOT) of Royal Melbourne Institute of Technology adopted the definition of call centre as “an operation that uses telephone and computer technology to deliver services to customers” (URCOT, 2001). This study also established that some important services, which are being offered by municipalities, are call centre service and walk-in-centre in an effort to improve service delivery to citizens.

Onyancha (2010) asserted that an electronic help desk that operates 24 hours a day, seven days a week, needs to be established to assist users with queries. The findings of this study have acknowledged that as interviewees express the following sentiments.

> *“Currently we have a 24 Hour Call Centre, where customers can phone and report all city related problems like accounts issues. And there is also an Emergency Call Centre to dispatch Ambulances and emergency vehicles”.* P1

"The purpose of the e-Services channel is to minimize the interaction with the call centre and facilitate and offer another channel to the citizens of Johannesburg to interact with the City of Johannesburg (CoJ)". P 1

The study therefore indicates that call centres plays a vital role in improving service delivery to its citizens through ICT.

6.3.7.2 Walk-In Centres

Turpin and Ghimire (2012) revealed that telecentres are public places with computers, internet and auxiliary services with human interactions. Turpin and Ghimire (2012) indicated that telecentres offer an innovative approach for extending access to ICT-enabled services in areas where there is poor network or where communities are disadvantaged and that they can be a public place like post office, school, health post, or any physical place that provides affordable access to the internet for variety of reasons. Findings of this study concur with Turpin and Ghimire (2012) observation in that municipalities have public customer walk-in centres which act as telecentres

"We have Customer Walk-in Centres where customers can go and log a query in a specific region. There is Various Customer Pay-points, Libraries, Clinics, Waste Management, Water, Electricity, etc". P1

The findings imply that not every citizen can afford to buy data bundles in order to access online services offered by municipalities. Instead some citizens rely on call centres and public walk-in-centres to access internet in order to do transactions with municipalities.

6.3.8 Online services offered by municipalities

Carrizales (2008) defined e-services as the use of technology for external government efficiency and effectiveness in providing services. Cloete (2003) argued that, in order for good governance to be achieved, there has to be an acceptance of technological service-delivery applications. Mpinganjira (2012) revealed that Government departments need to ensure that members of the public can get a wide range of services online so as to reduce the need for one to physically go to their offices. The revelation by Mpinganjira (2012) concurs with the findings of this study by Mukonza, et al. (2016).

6.3.8.1 e-procurement and Financial transactions

O'Donnell and Turner (2013) in their study establish that The Home Tax Service enables taxpayers in Korea to file tax returns, receive e-bills and process e-payments online.

O'Donnell and Turner (2013) further observe that with the establishment of the Korean government's e-procurement service, bidding for government contracts and payment for services or supplies takes place online and enhances the transparency and effectiveness of tax administration for both individuals and businesses. Observation by O'Donnell and Turner (2013) concur with the result of this study as indicted in the following quotations below;

> *"…when there is a request for quotation or request for proposals".* P4

> *"I think from a procurement point of view, I think we are in the planning stage in terms of introducing your e-procurement and I think those who are in business will be able to do their business online with the municipality".* P5

This was also echoed by Pascual (2003) who suggested that e-procurement can open new markets to local businesses by opening up the government process while making it more competitive and fair.

O'Donnell and Turner (2013) further highlighted that taxpayers can receive an e-bill for the payment of value-added taxes, global income taxes and other types of taxes. O'Donnell and Turner (2013) explained that payment can be processed through a wire transfer by using the e-payment service and citizens can also request up to six types of tax-related certificates online, such as a business registration certificate or tax payment certificate. Findings of this study share similar views by O'Donnell and Turner (2013) who stated that taxpayers receive e-bill and can do e-payment. Interviewees express the following sentiments;

> *"…our e-services website is also update basically daily because we generate water and electricity accounts and then we make it available online for citizens to access, we provide citizens access to online services available for instance they can view and download your water and Electricity Account online". P1*

> *"it's just the statement, the billing side of things that's offered online. Information about tariffs is also offered online and static information like the times offices are open and all that".* P3

> *"Well the website that we are planning to do will firstly be for financial information".* P4

Mukonza, Maeremule and Moetsi (2016) reaffirms that there are various services that are considered to be e-government services. These include e-payments, using e-mails, provision of information on websites, Short Message Services (SMS) and use of social

media in providing information, among others. This is in agreement with statements made by interviewees.

"…we have the accounts by email online" P1

"Email accounts, you can request municipality your account could be emailed to you on our website". P4

The types of e-government services that are offered by either a national government department or local authority are largely dependent on the type of technology available and these appear in different forms and shapes (Asgarkhani, 2012). The statement is in agreement with statements made by interviewees.

"Oh, unfortunately we are not at that maturity level as municipality to afford to offer those things online, but I think we are moving towards making the services of our electricity available online". P5

6.3.8.2 CRM

Bovaird (2003) maintained that the drivers for organisational change are many and one of it is through customer relationship management (CRM). Bovaird (2003) asserted that this comes as a desire to redesign ('re-engineer') organisational processes around the needs of service users and other stakeholders ('customers'), often through approaches such as customer relationship management (CRM). Kamblet (2003) established that CRM is a management approach or model that puts the customer at the core of a company's processes and practices. Sebastian and Supriya (2013) asserted that e-governance initiatives should be citizen-centric and demand driven. They further observed that instead of applying a push service delivery model where the citizens are forced to consume whatever is available, government should follow a demand-based pull model. Sebastian and Supriya (2013) further urged that public data should be available freely for use for all and that citizens should get an opportunity in decision-making process. Results of this study concur with Kamblet (2003) and Sebastian and Supriya's (2013) assertion and observation in that metro municipality have Customer Relationship Management Services which is offered online for citizens to consume services online. The following quotation from one of the interviewee agrees with these observations.

"The other services which I haven't mentioned there is obviously the how do I put it the CRM services (Customer Relationship Management Services) and we offer that one online as well". P2

The findings imply that municipalities which are at high maturity level of e-governance such as metro municipalities are able to offer Customer Relation Management Services which allow its citizens to access services online as citizen service transformation.

6.3.8.3 Properties

O'Donnell and Turner (2013) in their study established that The Minwon 24 e-government portal provides citizens with online access to application forms relating to civil matters such as residency, land and vehicle registration. O'Donnell and Turner (2013) indicated that overall, citizens and businesses can access over 1000 certificates and up to 4000 applications, complete tenders for government services and undertake taxation transactions. The above results correlate with the finding of this study for metro municipalities although number of certificates issues is less as compared to the ones issued in Korea municipalities. The following quotation supports that;

> *"They can view the building plan submitted to check the progress of the building plan. They can view the value of your property and object to the valuations the city have given the property, we have building plans tracker, we have evaluation of properties".* P1

Results of this study imply that ICT plays an important role in managing properties as far as plan submission, checking progress and valuation of properties is concerned.

6.3.8.4 Smart Cities

Smart city services provide citizens with an improved living environment and increase their overall quality of life for citizens (Yeh, 2017).Scholl and AlAwadhi (2015) revealed that local governments can play major roles in creating smart urban spaces, for example by making available modern and effective public administration and comprehensive online services based on novel ICTs. Scholl and AlAwadhi's (2015) observations concur with the results of this study in which different applications are put in place in metro municipalities. Bhatnagar, Jha and Singh (2011) asserted that the goal of e-governance is to create a more responsive, productive and effective administration. Singh (2012) further urged that e-governance is referred to as SMART governance in that it aims to use IT to improve the processes of government functioning by bringing about simple, moral, accountable, responsive and transparent (SMART) governance. The following quotation shares the same sentiments;

> *"So in our strategy we looking at and saying that you know there is a whole lot of what is done by people in the area of called smart cities for instance they put apps for policing, apps for air and water quality, apps for traffic management and apps for*

transacting and all this kind of things. We are not offering these services at the moment. However we are aware and we believe that you know when time comes I think we will be offering that, particularly getting information from and sharing the apps with the bigger municipalities". P3

The results imply that metro municipalities in South Africa are moving towards becoming smart cities with various applications in place to spearhead such initiatives. In Local district municipalities the initiative is still behind due to limited financial resources and lack of skills to implement that.

6.3.9 Advantages and disadvantages of ICT as part of e-governance

6.3.9.1 Advantages of ICT

AlAwadhi and Scholl (2013) found that the most prominent benefits were seen in the improvement of services, cost savings, efficiency gains, energy conservation and information sharing and integration. Similarly, in another study, efficiency gains, process streamlining, cost savings, service improvements, and information sharing and integration were found to be the most salient benefits (Scholl & Scholl, 2014). Results of this study share similar view on the benefits of e-governance with Paulo (2016) who established that implementation of e-governance projects brings benefits to any citizen who applies for services and information online. Paulo (2016) hold that the most evident opportunities are the following: reduction of long queues, 24 hours availability, efficient service, easy and fast access, reduction of service costs by cutting the tax burden, administration bureaucracy reduction, an administration more citizen-centred and inclusive, increased transparency in administrative procedures and more comprehensive and accountable government actions for citizens. Table 6-4 illustrate advantages of ICT, quotations and supporting sources.

6.3.9.1.1 Efficiency and effectiveness of services

Irafan (2017) argued that e-Governance builds the administrative efficiency: avoid lateness, transparency, easy access, responsiveness, reduced red tape, increasing quality of service and citizen centric delivery of services. This is in agreement with the quotations from interviewees in Table 6-4, which also concurs with Yang (2001) who noted that some e-government/e-governance programs have proven to be efficient, others are struggling, and the effectiveness of e-government/e-governance programs are even harder to achieve in situations where staff members from municipalities who are supposed to spearhead the program lack the necessary skills especially in local municipalities as compared to the metro municipalities. In their study, Trimi and Sheng (2008) concurred with results of this research

Table 6-4: Advantages of ICT, quotations and supporting sources.

Advantages	Quotation	Supporting sources
Efficiency and effectiveness of services	*"internally for us I think that will be the efficiency of the service we provide, fast and availability is key. So it's much more efficient way of delivering services and also of ensuring that there is efficiency internally"* P3	(Irfan, 2017) (AlAwadhi & Scholl, 2013) (Trimi & Sheng, 2008) (Yang, 2017) (Paulo, 2016)
	"and bring about efficiency and effectiveness in the manner in which we provide services" P5	
24/7 services	*"Firstly availability you are not bound by office, easy access of information you don't have to wait until the office is open to get the information, you can get information whenever it's good for you to have it*". P4	(Mutula & Ocholla, 2010) (Mbatha & Lesama, 2013) (Paulo, 2016)
Convenience	*"I think you know, it's more convenience".* P 3	(Carter & Belanger, 2004) (Khalo & Hu, 2010)
Cost reduction	*"…and that the cost are reduced".* P 3	(Scholl & Scholl, 2014)
	"ok and did my result cost deduction, If you want to have enquiry 24/7 it can cost you a lot of money but if you want to do your enquiry on internet is there". P 4	(Ndou, 2004) (Mbatha & Lesama, 2013) (Paulo, 2016)
	"I think the major advantage is really it decreases the cost of doing business with the municipality and the speed that is involved in providing that particular service". P5	
Improve service delivery	*"Well, ICT is a key player in providing e-governance that to improve service delivery in the areas where ICT is generally embedded in most of the processes that are used to deliver the services".* P2	(Shilubane, 2001) (Bhatnagar, et al., 2011) (Tobin, et al., 2013) (Khalo & Hu, 2010) (Paulo, 2016)
Reduction of errors	*"you know you need to reduce errors".* P3	(Trimi & Sheng, 2008) (Mpinganjira, 2012)
Speed operations	"*The environment is secured protected by Firewalls, and this Speed up day to day operations".* P1	(Mbatha & Lesama, 2013)
	"and the speed that is involved in providing that particular service". P5	
Cloud storage	*"Information is stored online, the information is make available on a network, where multiple people can access the information".* P1	(O'Donnell & Turner, 2013)

when they concluded that since the 1990s, public-sector organisations across the globe have been applying Internet technology and other ICTs innovatively so as to deliver services, engage citizens and improve efficiency. It therefore implies that municipalities seek to improve efficiency and effectiveness in the manner in which services are delivered to citizens by using ICT tools as part of e-governance.

6.3.9.1.2 24/7 services

The results of this study share similar views by Mbatha and Lesame (2013) who established that application of e-governance allows citizens to interact with government seven days a week and twenty-four hours a day through various media such as the Internet and e-mail. The results also support Mutula and Ocholla (2010) who found out in their study that e-governance allows the citizen to access these services online 24/7, thus further enhancing citizens' trust in their governments. The interviewees express their sentiments as shown in the above quotations in Table 6-4. Results of the study indicate that citizens would want to have access of municipality services at any given time and it will save them of time and cost.

6.3.9.1.3 Convenience

Results of this study reveal that e-governance brings convenience to citizens as highlighted in the quotation in Table 6-4. Findings of the study share similar view by Carter and Belanger (2004) who noted that electronic government increases convenience and enhances accessibility to government services. The results supports the results of Khalo and Hu (2010) who concluded that the governments should adopt ICTs in its services so that it is able to deliver these conveniently and efficiently to citizens. The results indicate that citizens are concerned with convenience when they are accessing municipality services from municipality. Convenience is one of the aspects which encourage citizens to pay their bills to municipality as they will be seeing value in the services they are getting.

6.3.9.1.4 Cost reduction

The successful e- governance will save money and it can be helpful to develop ICT based generation and to increase the economic growth (Alam, 2012).The results of this study share similar sentiments in believing that the use of ICT as part of e-governance reduces costs with Alam (2012) and Ndou (2004) who outlines some of the benefits of applying ICTs in government departments. These are cost reduction which agrees with the quotation in Table 6-4 and efficiency gains; improved quality of service delivery to businesses and customers; transparency, anticorruption and accountability; increases in the capacity of government;

network and community creation; improvements in the quality of decision making; and, promoting the use of ICTs in other sectors of society. The results of this study correlate with observation by Mbatha and Lesame (2013) who established that ICT have also brought about a dramatic reduction in the cost and time involved in storing, processing and transmitting information – thus in fundamentally reshaping government ministries and society as a whole. The results imply that one of the objectives for municipalities to is to reduce cost through the use of ICT in their operations in delivery services to citizens.

6.3.9.1.5 Improve service delivery

According to Shilubane (2001) e-government uses technology (especially ICTs) as an enabler to facilitate government service delivery by improving internal operations of the government. In support of the views of the results of this study as expressed by the interviewees' sentiments from the quotations in Table 6-4, Tobin, Porumbescu and Lee (2013) pointed out that ICTs greatly influence better governance and service delivery. Further confirmation of the results of a study conducted by Khalo and Hu (2010) revealed that the Department of Home Affairs – as an essential service delivery department in South Africa's democracy – implemented an aspect of ICTs via e-government to achieve higher levels of service delivery to meet the needs of the citizens.

Mbatha and Lesama (2013) shared similar view that the availability of ICT tools in government departments suggests that improved service delivery can be expected. The results further concur with Mbatha and Lesame (2013) study who establish that the emergence of ICT has not only revolutionised how business is conducted, but has also transformed the delivery mechanism of governmental services. The findings imply that the essence for municipalities to embark on e-governance is to improve service delivery to its citizens through various ICT tools.

6.3.9.1.6 Reduction of errors

Results of this study established that the use of ICT as part of e-governance reduces errors in the way operations are carried out by municipalities. Further confirmation of the results of this study comes from a study conducted by Trimi and Sheng (2008) who argued that mobile government through technology does not only reduces some logistical burdens and decreases data-entry errors, but it also helps employees to make informed decisions and take appropriate action. Mpinganjira (2012) noted that e-delivery of services results in a reduction of tedious paper work often associated with traditional delivery channels. The quotation is shown in the Table 6-4. The results imply that if statements sent to clients are

free from errors and reduce paper work, citizens can pay their bills and municipalities will be able to provide services to citizens.

6.3.9.1.7 Speed operations

Results from this study reveal that the use of ICT as part of e-governance can increase the speed of operation by municipalities. This was echoed by the interviewees in their quotations in Table 6-4.Mbatha and Lesama (2013) also acknowledged that ICT can serve as catalysts in the functioning of all economic and social sectors. More specifically, they can speed up – even be an alternative to – the extension of services in areas such as health care, education, agriculture, business and government. In support of the results of this study, Mbatha and Lesame (2013) reaffirmed that ICT play a crucial role in speeding up the flow of information and knowledge in the public sector and also in transforming the way in which government and citizens interact directly. Mbatha and Leseme (2013) indicated that ICTs have proved to be key catalysts in increasing work productivity and creativity in the public sector. The results indicate that for municipalities to deliver efficient and effective services to its citizens, internal processes in terms operating systems and applications software to be up to date.

6.3.9.1.8 Cloud storage

Prabu and Ganapathy (2017) expressed the opinion that cloud computing takes the technology, services, and applications that are similar to those on the Internet and turns them into a self-service utility. Cloud storage is therefore one component of cloud computing. O'Donnell and Turner (2013) in their study established that major initiatives undertaken by MOPAS include the transfer of the Korean government's entire IT system and data to the cloud environment by 2017. This observation by O'Donnell and Turner (2013) was found to be important for this study as municipalities are vulnerable of losing their data through fire and virus and if it is saved in the cloud it will be easy to recover to lost data which is saved on internal hard drive and other external medium such as Compact Disk, memory stick, external hard drives etc.

6.3.9.2 Disadvantages of ICT

Mzyece (2012) in his study revealed a number of common failure factors or inhibitors, including: lack of stakeholder engagement and involvement; lack of implementation of policies; resistance to change by the "old guard"; corruption leading to the deployment of low quality and ultimately useless ICT solutions; lack of appropriate skills and skilled personnel; lack of foresight and coordination; lack of supporting infrastructure; underfunding; bureaucracy; poor work culture; high import duties on ICTs; cost of ICTs; unsustainable

funding(Mzyece, 2012). This study analysed positive and negative factors favouring or hindering the adoption of e-governance in South Africa. Further confirmation of the results of this study comes from e-government adoption model based on TAM (Davis, 1989). Negative factors identified in the study include: exorbitant Internet connectivity costs; restricted access (e.g. systems accessible to Internet users only); poor ICT infrastructure; unwillingness of staff to adopt new systems; and lack of content in indigenous languages. The results of this study share similar sentiments as highlighted by the following quotations under each subheading.

6.3.9.2.1 Computer illiterate

Mbatha and Lesama (2013) in their study found that the availability of ICT tools in government departments suggests that improved service delivery can be expected. Mbatha and Lesama (2013) indicated that it should be noted that this availability does not necessarily mean that they (ICTs) are actually being used in that their use may be hampered by a lack of computer skills, low levels of confidence and negative perceptions in respect of ICTs. This study supports the results by Mbatha and Lesama (2013) by reaffirming that computer illiterate is a challenge in implementing ICT as part of e-governance. The following quotations demonstrate such a challenge.

> *"The biggest, biggest challenge is that the majority of our citizens are not computer literate".* P2

> *"I think it basically drive us to a point that as and when people become ICT literate I think they would be a huge expectation in terms of us improving those business processes and it means that we would have to invest more resources in making sure that our resources are able to match that demand moving forward".* P5

Ntetha and Mostert (2011) study acknowledged the results of these findings by maintain that civil servants identified a range of factors that they considered to be inhibitors to their effective use of ICTs, particularly a lack of access or of availability of hardware and software, and the lack of ICT education, ICT skills and knowledge regarding ICT. The results indicate that although citizens are willing to take and use ICT, they have a challenge in that they lack computer skills to access online municipal services.

6.3.9.2.2 Infrastructure

Mpinganjira (2012) in his findings showed that access to necessary infrastructure is not sufficient to make one make use of e-services. The study by Sebastian and Supriya (2013)

reaffirmed that the ICT infrastructure still acts as the key barrier for e-governance adoption. Sebastian and Supriya (2013) indicated that the information technology infrastructure is composed of hardware and software that will provide secure electronic services to citizens, businesses and employees and that the communication infrastructure includes mobile networks, telephone networks, broadband connection and telecentres. The results of this study support the findings of Mpinganjira (2012) and Sebastian and Supriya (2013) as expressed by the following interviewee statements:

> *"The disadvantage is that obviously sometimes cannot reach all population. Sometimes we are limited by infrastructure".*P2

The findings indicate that municipality need to invest in ICT infrastructure for the successful rolling out of ICT projects.

6.3.9.2.3 Initial capital outlay

Habeenzu (2010) in his study outlined some of the challenges of implementing e-governance as poorly developed ICT infrastructure owing to high costs in technology acquisition and deployment (such as initial costs for setting up the ICT backbone infrastructure) and high costs to access Internet-enabled ICT platforms(Habeenzu, 2010). Results of this study concur with the findings of Habeenzu (2010) in which cost was cited as a major hindrance to e-governance initiatives. Further confirmation of the results of this study comes from AlAwadhi & Scholl (2016) who found that ICT self-sufficiency requires a critical mass of resources, which limits the choices a smaller municipality might have. Clearly, resourceful big municipalities can afford to have their in-house ICT departments and vendor independence for their mission-critical systems. It therefore implies budget should be allocated to ICT just like any other critical service area.

> *"The cost at the end of the day is not an issue because it should come down. It's just to get the money or capital to start doing it. But at the end of the day should reduce the cost"*. P3

> *"Well, the first one I said is costs".* P4

A prior study argued that larger government departments are more likely to utilize electronic applications than smaller departments (Ahn, 2011). This is due to their access to greater budgets, and more resources. It therefore follows that even local district municipalities need prioritise ICT for the promotion of uptake and usage of ICT by citizens.

6.3.9.2.4 Lack of adoption and resistance

The widespread adoption of ICTs results in structural changes, both in the internal organisation of the public service and in its external interfaces with the public and also with suppliers of goods and services to government (Borins, 2007). Some staff members and citizens therefore resist to such structural changes. These arguments are supported by the participants' responses as highlight in their quotations:

"…sometimes there is a lack of adoption or resistance". P2

"The Citizens can also come and walk into a Triple C where they used to fill in a form manually and now you are asking them maybe to type in the form and they are saying Yoooh! I don't know where this information will go so I don't want to do that. Or you are saying to them yaah you can pay your bill on the phone and they are saying what! I would rather come with cash and pay the bill over the counter so you experience that resistance from both sides actually and that can be quite a challenge". P2

"On issues because they are types of initiatives there are internal focus, initiatives efficiency, mostly that's where you get a little beat of resistance efficiency but the customer are always supportive depending on how you place them or explain to them". P3

Mbatha and Lesema (2013) believed that most new innovations (depending on their purpose, need and acceptance) often achieve slow penetration at first, but then grow quickly as their adoption and rate of use increases. The results of this research therefore hold that if staff and citizens are informed of the benefits of ICT as part of e-governance their uptake and usage will increase.

6.3.9.2.5 Security issues

Gualdoni, Kurtz, Myzyri and Rizvi (2017) argued that identity theft is a very scary and real threat to everyone. In order to give people peace of mind a new algorithm of mitigating risk is made available in the form of the Secure Online Transaction Algorithm (SOTA). Mpinganjira (2012) in his study found out that lack of awareness of available e-government services and security concerns were two factors with the highest percentage of respondents indicating that they regarded them as important or very important challenges facing adoption of e-government services in South Africa. The results support Mylonakis and Malioukis (2010) who observe that online services are by nature prone to security attacks and this instils fear on the part of targeted users. Sebastian and Supriya (2013) revealed that lack of security

rules and policies, threats from hackers, intruders, and viruses, absence of privacy of personal data are the major problems in developing an effective web model for the e-governance initiative and people feel unsafe to avail the services over the web in such conditions. The results of this study confirm that security issues are a concern as indicated in the following quotations:

> *"Also another big thing there it should be aware of but it's more of us internally to do good is the security around these things".* P3

> *"There is issue around also security, we need to be sure that security is cool and not only end-point but the wide area network security and Apps security".* P3

The findings imply that citizens are not encouraged to uptake and use ICT initiatives as part of e-governance until and unless security issues by municipalities are addressed.

6.3.9.2.6 Staff resistance

Paulo (2016) asserted that Chinese civil servants, generally speaking, lack expertise and skills to fully develop, implement and monitor e-governance projects. The results of this study correlates with observation by Paulo (2016).

> *"Both, Sometimes employees have been set in a certain way of implementing those services and now you are telling them no let's do it smarter, let's do it quicker, let's do it you know in a more accountable manner and they can say NO we have been always doing it this way so you can experience that resistance from both employees and from the citizens".* P2

> *"I think most people have resistance to efficiency type of initiatives".* P3

> *"…you know that resistance to change issue, especially resistance to technology which they think they do not understand. They don't have to understand it. Understand what the system does for you, not how do you get to that. That seems to be a block".* P4

The results imply that is civil servants lack computer skills they will resist the change which is brought by technology.

6.3.9.2.7 Unavailable network

A study by Zawada, Wallmach and Mabule (2007) established that in many countries –South Africa included – there is great improvement in telecommunications through different mobile cellular networks and computers, along with increased utilisation of the Internet for e-mail, e-commerce, e-searching and videoconferencing. Their observation is in contrast with the findings of this study as availability of network is still a challenge as highlighted by the following quotations:

> *"Well, at time the network becomes unavailability or unstable which causes employees not to be able to work".* P1

> *"…then the unavailability again of network problems".*P4

The results of this study imply that municipalities are faced with challenge of network availability, which therefore affect the uptake and usage of ICT as part of e-governance in accessing municipality services.

6.3.9.2.8 Load shedding

The findings of this study indicate that load shedding and theft of cables is a challenge in municipalities which is affecting the uptake and usage of ICT. This is supported by the following quotation:

> *"…load shedding is also a disadvantage".* P1

The findings are consistent with the findings by Komba (2015) whose observations suggested that lack and/or unreliable electricity had a negative relationship with e-government adoption. This is also confirmed by Lin, Fofanah and Liang (2011) in their research of the Gambian e-government situation that, there was a direct relationship between power availability and a citizen's ability to make use of available government services.

6.3.10 Staff buy-in and support

6.3.10.1 Staff buy-in in e-governance

The findings of this research suggest that majority of staff support e-governance initiatives as they are aware of advantages associated with it. These findings are in contrast with a study contacted by Komba (2015) who found out that there is no support from the

government officials. These results are also in contract with previous studies by Ebrahim, Irani and Shawi (2003) which showed that some government officials perceive e-government as a potential threat to their power and viability because it might reduce their authority in government and therefore, are reluctant to the idea of online transactions. These are the supporting statements for e-governance initiatives by the interviewees. These findings do not agree with findings of this study as the use of technology is taking over in all spheres of government and business in this day and age. Here is what the interviewees had to say;

> *"I think generally they are, especially when you have made them understand what the advantages of that are emanating from that".* P2

> *"Ok, I think the staff are very supportive because it makes their jobs particularly those that are affected makes their jobs easier and I think because we are a small municipality that is constrain of resources so we could use resources elsewhere".* P3

These quotations imply that the use of ICT as part of e-governance is no longer a threat to staff as they have appreciated the benefits associated with it. It therefore means that staff members accept the uptake and usage of ICT as stated in objective 1 of this study.

6.3.10.2 Staff resistance

Tankoano (2009) observed that the clientele constitutes the main obstacle faced by e-governance. Tankoano (2009) further argued that this obstacle is linked to a lack of sensitivity on the part of role-players; a low level of adaptation to these technologies by individuals, administration and businesses; resistance to change; and weak existing infrastructures. Results of this study share views similar to that of Tankoano (2009). Further confirmation of the results of this study comes from Sebastian and Supriya (2013) who noted that low education and ICT skills is a key barrier to the ICT adoption and use. Interviewees express the following sentiments;

> *"Staff not computer literate, sometimes there is a lack of adoption or resistance".* P1

> *"Both, Sometimes employees have been set in a certain way of implementing those services and now you are telling them no let's do it smarter, let's do it quicker, let's do it you know in a more accountable manner and they can say NO we have been always doing it this way so you can experience that resistance from both employees and from the citizens… but you are right, you will find one or two who really get resistant because they feel that their jobs are threatened".* P2

"…you know that resistance to change issue, especially resistance to technology which they think they do not understand. They don't have to understand it. Understand what the system does for you, not how do you get to that. That seems to be a block". P4

"More specifically the younger generation tend to accept the uptake and supportive to that, I think it's quite unfortunate and even in older generation, we don't necessary have that huge number which actually resist change that in terms of providing services". P5

The results imply that technological change could not be easily embraced by staff members and citizens as they fear of losing their jobs and not trusting the new technology.

6.3.10.3 Change management

Bwalya and Mulula (2015) proposed that in order to incorporate change management plans in the overall government culture and practice and encourage public service business process re-engineering and this should include what should be done, by who, how, and when. Bwalya and Mulula (2015) indicated that change management plan should be a continuous plan that should be embedded into all the core clusters of the e-government strategy. The results of this study found out that change management is lacking in municipality e-governance strategy since the introduction of ICT is still being resisted by some members of staff and citizens. Abdul, Hamdan, Yahya and Shanudin (2002) observe that the rapid development of ICTs has, from time to time, changed humans' way of life. This observation agrees with the findings of this study as eluded by the following quotes. Abdul, et al. (2002) further interpreted that ICTs as a discipline of science, technology, engineering and administration that is used to manage and process information, create interaction between humans and computers and describe the related social, economic and human culture and the environment. The following quotations support that;

"But I think the job is easier as I said on the effectiveness, more externally focused customer focused initiatives. So online service delivery like in any other improvement type of technology you know it has to be explained in the right way and people shouldn't left with the questions on the role they will play in that space. They should understand and it must be a positive thing in managing change". P3

"So those issues around managing change because you know it's normal human behaviour". P3

The findings indicate that introduction of e-governance in municipalities require to manage change in their e-governance strategy as it affects human resources and business processes as jobs are made easier through technology.

6.3.11 Citizen Relationship

Kent (2013) found that online interactions can allow governments to build relationships with stakeholders, solve problems, and set forth socially responsible goals. Mzyece (2012) in his study emphasised citizen engagement as a success factor, specifically, implementing effective public awareness campaigns and stakeholder collaboration processes in order to, for example, enforce citizens' rights to access information and participation in decision-making, pointing to the need to transition to e-governance. These findings concur with the results of this study as highlighted in the following comments:

> *"Yaah I think everywhere where you open channels of communication, relationship improves because there is certainty around many things".* P3

> *"I think if we can get feedback from the communities to then say these are the areas of improvement that we need to improve on and surely make that promise to improve around that".* P5

The findings indicate that the essence of e-governance is to improve citizen relationship. This is done by open the channels of communication and giving timeous feedback to citizens.

6.3.11.1 Accurate information

Mbtha and Lesema (2013) in their study found that the benefits of using ICT in government departments is that ICT were found to provide accurate data in a timely manner and as needed and also to provide accurate and updated information to decision makers and investors. Their results are in agreement with the results of this study as highlighted by the following quotation.

> *"So through the use we ensure that we get timely and accurate information to the citizens".* P3

The result indicates that a municipality gains trust from their citizens by providing them with accurate information of which they you it to make informed decisions.

6.3.11.2 Demonstration

Results of this study agree with Chaterera (2012) who recommends that awareness campaigns regarding e-government services are very important in promoting e-governance adoption. Chaterera (2012) explained that this can be done by organising exhibitions, conferences, seminars and press releases, and by broadcasting e-government services on national television and radio. Chaterera (2012) moreover believes that in these awareness-enhancement programmes, citizens should be informed about the benefits to be gained from, and the use of the services.

> *"Demonstrating and by creating an awareness of usability of online services available".* P1

The findings indicate that citizens can be informed of the importance of e-governance through demonstrations and various campaigns which can create awareness of the usability of online services.

6.3.11.3 Reliable e-services

Mbatha and Lesema (2013) stated that money should be set aside for the purpose of increasing bandwidth to provide a speedy, reliable and consistent Internet connection. The statement concurs with the following quotation;

> *"I think that the municipality should provide reliable e-governance, e-services. The services should be able to result in tangible benefits for the citizens and to provide the efficiency they require and convenience is a big thing".* P2

The results indicate that reliable e-services can only be achieved by increasing the bandwidth so that citizens can have access to internet without any disruptions or interferences.

6.3.12 Strategies to improve online service delivery

6.3.12.1 24/7 Web service

Mutula and Ocholla (2010) revealed that e-governance maturity allows the citizen to access services online 24/7, thus further enhancing citizens' trust in their governments. Findings of this study agree with those of Mutula and Ocholla (2010) as indicated in the following quotation;

"24/7 Available online web service. Add more departmental services online for customer to view and access". P1

Results of this study indicate that 24/7 web service allows citizens to access municipal services at the comfort of their homes at any given time thereby enhancing citizens' trust with their municipality.

6.3.12.2 Communication infrastructure

A research conducted by Human Sciences Research Council (2005) found that South Africans experience many forms of poverty, including infrastructure, services and information poverty. Information poverty refers to lack of access to and utilization of information and communication technologies and the services that they facilitate, including electronic transactions and Internet banking, government services online, access to online educational content or entertainment. The South African digital divide shows major differences in ICT access between and within provinces. The finding, however, is in disagreement with the following comment from an interview participant;

"We would increase and really have a very strong communication infrastructure that we can access those apps'. P3

The findings from this study imply that municipalities are moving towards improving online service delivery by having strong communication infrastructure. The results indicate that municipalities are trying to bridge digital divide which has been in existence for a long time by increasing communication infrastructure in both metros and local district municipalities so that citizens can have access to online services.

6.3.12.3Political buy-in

Political commitment is a major precondition of the successful implementation of any e-government initiative. Karim and Khalid (2003) argue that some governments in developing countries do not have the commitment to implement e-governance and these governments are also poorly equipped to develop and propose successful policies. However, Mamaghani (2010) in his study observe that in developing countries, unstable political conditions and inadequate policy formulation act as barrier for ICT deployment. Onyancha (2010) recommended that government leaders show goodwill (by providing an enabling political, social and economic environment) with regard to ICT policy formulation, and consider e-governance as an enabler as opposed to a competitor, thereby throwing their weight behind all initiatives that are geared towards achieving e-governance in the region. The above

observation by Mamaghani (2010) and recommendations by Onyancha (2010)) confirm the results of this study as expressed by interviewee in the quotations below;

> *"Ok, first one is political buy in. This is a political organisation. if the politicians decide that's the way we go, that's the way we go. That's what they call democracy and they have been elected and that's what they are supposed to do to give direction to the municipalities".* P4

The findings indicate that without political buy-in in e-governance initiatives, the project of ICT in municipalities will not succeed.

6.3.12.4 Public internet

Onyacha (2010) in his study found out that the number of personal computers in Africa is low and the growth in internet usage witnessed over the past ten years could only mean that the African population is forced to share the relatively small number of available computers to access information on the internet. The results of this study concur with Onyacha (2010) findings as highlighted in the quotation below;

> *"Citizens who don't have access to online services should make provision in regions for citizens to have public access to the internet".* P1

Verneulen (2011) finds that many people in South Africa access Internet services at places of work. It therefore follows that those without access to internet at work place are deprived on the usage of ICT. Hence, the results imply that municipalities through its policies are making provisions to establish public internet access to citizens so that they could be able to access municipality services.

6.3.12.5 Managing Relationships

Kamblet (2003) argued that as a means of strengthening institutional relationships Government partnerships should be able to strengthen relationships between the government and other institutions such as NGO's. Kamblet (2003) indicated that this will help in creating a strong economic, social and political format within the society. Sheridan and Riley (2006) make the observation that e-governance and e-government denote two distinct concepts and they see e-governance as a "wider concept that defines and assesses the impacts technologies are having on the practice and administration of governments and the relationships between public servants and the wider society" (Sheridan & Riley, 2006). The results of this study agree with the interviewee who also asserts that relations should be

managed between government and its different stakeholders. The following quotation supports this argument.

> *"…we need to have some different types of relationship management and government managing relationships".* P3

6.3.12.6 Remove corruption

The e-Governance strategies are serving as a mechanism effort on the quality of governance and combating corruption across the global world (Irafan, 2017). Irafan (2017) argued that the role of information and communication technology (ICT) in serving as a mechanism to improve effective public service delivery, better transparency and combating corruption in developed and developing countries. The above views correlate with the results of this finding whereby corruption is affecting the implementation of ICT and e-governance initiatives and therefore should be costly to the perpetrators. The following quotation demonstrates such concern.

> *"They need to get rid of corruption in Management".* P1

The results indicate that if corruption is not addressed it can affect the implementation of ICT and e-governance.

6.3.12.7 Modern Technology and Right Software

Khalo and Hu (2010) assert that in response to a view of government performance and increasing public demand for the delivery of 'better' services in terms of quality, accessibility and choice, the mode of operation of government departments in South Africa has been subject to major modernisation efforts. Komba (2015) in her study found out that the successful adoption of e-government systems will require a widespread, common and modern ICT infrastructure. The study findings concur with the strategies which are being put in place by municipalities in South Africa which supports successful implementation of e-governance initiatives. Here is a quotation which supports that;

> *"So this is our strategy as I said, you would look at ensuring that our desktops are modern and up to date with right software so that we can get".* P3

The findings suggests that without modern ICT infrastructure and software there won't be any guarantee that e-governance initiatives will be successful.

6.3.12.8 Security issues

Government and people expect their data to remain secure if they were to use e-services, and these are; cash, medical records, bank accounts, agreements, official communication, emails, decisions, citizens' identity information, intellectual property, etc and hacking of the most protected government websites has taken place and data stolen and misused(Singh, 2018). Irafan (2017) indicated that the trusts, low cost service, easy access, security, responsiveness, time saving are positive factors for administrative efficiency and e-Governance. Singh (2018) and Irafan (2017) agree with the findings of this study as security issues is still a concern as highlighted by the following quotations;

> *"Also another big thing there it should be aware of but it's more of us internally to do good is the security around these things".* P3

> *"I think here the issues around the accuracy of information and security. I think you know, now accuracy and immediacy of Information is more for us people would want more updated information and immediately and we are worried about obviously the security".* P3

Municipalities are therefore required to address security issues if implementation of e-governance is to be successful.

6.3.12.9 Shared applications

Scholl (2016) outline that ICT self-sufficiency requires a critical mass of resources, which limits the choices a smaller municipality might have. Scholl (2016) urged that resourceful municipalities such as big metro municipalities can afford to have their in-house ICT departments and software independence for their mission-critical systems. Scholl (2016) further outline that smaller municipalities have the choice of either using software leading to dependencies on private interests, or forming collaborative alliances that pool and leverage their resources. Scholl and AlAwadhi (2015) observed that it is both interesting and revealing that commercial vendors consistently refuse to engage in pool agreements for their software with smaller municipalities (Scholl, 2016). The results for this study therefore share similar view with Scholl (2016) in that smaller municipality cannot afford big systems and applications and therefore need to share applications with bigger municipalities.

> *"Well, I believe for smaller municipalities we are quite clear like we cannot afford the big system and apps, so what we need to be looking at and this is our strategy here is that we would go cloud apps or shared app or app shared with bigger municipalities*

like Erkululeni or other provincial government". P3

The results imply that Local district municipalities are struggling to fully implement e-governance initiatives as compared to metro municipalities. Metro municipalities have large resource base in the form of rates and taxes which they charge citizens as compared to local district municipalities whose revenue base is constrained due to poor revenue collection because of defaulters who are affected by high levels of poverty and unemployment.

6.3.12.10 Skilled professionals and staff training

In their study, Paterson, McGrath and Badroodien (2005) note that, in South Africa, considerable attention has been paid to intermediate level ICT skills in light of the advantage of ensuring that the country develops a competitive edge with a view to attracting investment in response to national transformational prerogatives, which include growth and employment. Mpinganjira (2012) further observe that Government employees need to be specially trained to handle customers online and provision of prompt responses to online queries is essential in this regard. The above observations correlate with the findings of this study as municipalities advocate employing skilled professionals in order to deliver online services to citizens. Mbatha and Lesema (2013) moreover believe that a number of measures need to be put in place, for example the enactment of an enabling policy and legislative framework to cater for skills development and the improvement of infrastructure (that is, telecommunications). The author's observation share similar sentiments the interviewees who express the following;

"employ skilled professionals". P1

"To improve the service delivery, staff needs to be trained be more professional and productive. They need to know their product, they must not be sending from pillar to post. Some customers when they phone call centre they are send from pillar to post". P1

The results therefore indicate that in order to ICT and e-governance to be successful staff members should be skilled first so that they can also pass such skills to the citizens.

6.3.12.11 Corporate governance ICT framework

Oracle (2006) identifies weaknesses associated with conceptualising, operating and maintaining systems of e-governance. Oracle (2006) explained that these include social aspects (poor basic education, low literacy levels, poor IT literacy, different languages, lack

of public acceptance of self-service models, and shortage of skills); political aspects (low budget allocation, absence of cyber laws, slow decision-making processes, inadequate hierarchical structures, short-term approaches owing to elections, and inadequate integration and reform agendas); economic aspects (a lack of investors and poor budget control); and technological aspects (shortage of IT skills, high internet costs, heterogeneous data, lack of IT standards and software licences)(Oracle, 2006).

6.3.12.11.1 Digital ICT Framework

Abrahams and Newton-Reid (2008) carried Community Survey and results show that approximately half of households in Gauteng (49%) have access to a mobile phone, nearly double the number of households that have access to landlines (28.5%). These results were disaggregated to a municipal level and further disaggregated to a community level to understand the trends in the penetration of ICTs, in order to design highly specific access and delivery strategies for e-governance, connectivity and digital inclusion (Abrahams & Newton-Reid, 2008). Results of the study agree with Abrahams and Newton-Reid (2008) in that municipalities are taking initiatives in coming up with digital framework which connect citizens. A further service available using mobile phones involves the provision of real-time information to citizens on their mobile phones regarding natural disasters such as floods under the National Disaster Management System (MOPAS, 2012). Interview participants remarked,

> *"so if you think for example, if I show you this picture here which reflects digital framework, digital ICT framework and just at high level so this picture just shows communication layer, it shows the application layer, then it shows the analytics layer, and then integration analytics layer. If you look at this from the bottom there we have got things like for example safety, policing and whatever, we have got cameras, we have got sensors that is placed around the city. They pick up information that is analysed through the application and provided information as consumed up there. We have got Mobile phones, we have got tablets, radios and all that, those things all brings in information about that is used by these service security, traffic, government which means all the administration staff when people are apply for land, when they apply for emergency communication, health care, education, campuses and building its being enabled through technology".* P2

> *"So it really changes the model of ICT and those are the key issues for smaller municipalities". P3*

"I guess for large municipalities they will be the issue around architecture, around disaster recovery, data centres and around a whole lot of things, this is for larger municipalities". P3

The findings imply that municipalities whether metro or local district are having an ICT framework although at various implementation stage.

6.3.12.11.2 Full ecosystem

ICT ecosystem is composed of four layers -content, hardware, software, and telecommunications (Lee, Park, & Lee, 2018). Sebastian and Supriya (2013) revealed that the ecosystem of an e-governance project consists of telecommunication infrastructure, supporting technology, policies, technical skills of the users, etc. Sebastian and Supriya (2013) further observed that the readiness of this ecosystem is an important factor which determines the success of these initiatives and it is important to investigate whether this ecosystem is ready to adapt the technology. Abrahams and Newton-Reid (2008) also argued that South African city and municipal governments can build such e-governance within a broad development approach. Abrahams and Newton-Reid (2008) explained that municipalities can activate e-governance programmes that enable citizens, business and SMEs to interact with government using the full range of electronic media, through incorporating relevant measures in growth and development strategies (GDS) and integrated development plans (IDP). These sentiments were in agreement with interview participant who had this to say;

"I think, you have to think about online services as a full ecosystem that supports the full entire requirements of citizens. So when you think about how citizens will communicate with the rest of the world. When you think about the level of inter-relatedness of things which we call now internet of things if you look at how things are slowly becoming interconnected you would want the citizens to be able to work in an environment where they know that they can be able to get their services as quickly as possible and be able to function in the rest of the world like any other citizen out there. So I think the whole e-governance ecosystem needs to be thought of as a bigger picture rather than just isolated incidence of Pick and Payee for my bill". P2

It therefore implies that e-governance should be looked at through the lens of full ecosystem that enables citizens, business and SMEs to interact with government using the full range of electronic media. The framework which is developed in this study in the next chapter is therefore incorporating such aspects as it addresses objective 3.

- **Application layer**

Backus (2001) argued that e-governance is more than just a government website on the internet, and that it should be thought of as the “application of electronic means in the interaction between government and citizens and government and businesses, as well as (the application of electronic means) in internal government operations”. The argument by Backus (2001) concurs with the findings of this research as application allows citizens to access municipality services through various applications. The following quote supports the arguments.

> *“They pick up information that is analysed through the application and provided information as consumed up there”.* P2

- **Communication layer**

O'Donnell and Turner (2013) state that citizens can use their smart phones to report threats of violence, or to report missing children to the authorities and this service works in tandem with closed-circuit television (CCTV) control towers to monitor the threats reported by citizens. Results of this study share similar view with O’Donnell and Turner (2013) in that citizens make use of cameras and sensors which are planted in and around municipality areas as a surveillance mechanism. Onyancha (2010) noted that in all the proposed models of communication, emphasis is on a two-way system of communication between the players, that is government to citizens and citizens to government; government to business and business to government; and citizens to business and business to citizens. Onyancha (2010) expressed that citizens’ interaction with the business community is sometimes facilitated by the government via the hyperlinks to businesses on a government’s website.

Onyancha (2010) have also acknowledged that Kenyan government identifies communication within the government and communication with business and citizens as its core e-governance activities. Some similar services and products were noted on the government websites of a few other countries such as Republic of Tanzania, Ghana and Malawi. The findings of this study established that South African municipalities are at advanced stage especially with metro municipalities in providing advanced communication platforms such as cameras and sensors. The interviewee expresses such sentiments in the following quotation:

"If you look at this from the bottom there we have got things like for example safety, policing and whatever, we have got cameras, we have got sensors that is placed around the city". P2

The results of this research indicated that metro municipalities in South Africa are under surveillance to monitor criminal activities and to report any such incidences.

- **Analytical and Integration layer**

O'Donnell and Turner (2013) revealed that there is a growing trend involves the use of smart phones by citizens to interact with e-government services. O'Donnell and Turner (2013) also established that some 30 million citizens possess a smart phone in Korea and citizens can use their smart phones to alert the authorities of a road-side problem, such as illegal parking or malfunctioning traffic lights, by emailing a photograph to the customer service section of the relevant government agency, which then coordinates a response and reports back to the citizen when this action has been completed. Findings of the study share similar sentiments with O'Donnell and Turner (2013). Results of this study indicate that mobile phones, tablets and cameras play a crucial role in the uptake and usage of ICT as part of e-governance.

Onyancha (2010) in his study found out that entertainment and news, which are the main services provided by radio and television, appeared to be the citizens' preferred services, resulting in numerous people owning radios in the region. Onyancha (2010) however revealed that, it is worth noting that governments could use this service to improve service delivery. Onyancha (2010) explained that fast gaining in the popularity stakes are mobile phones and personal computers. Generally, electronics (including mobile phones and personal computers) are becoming cheaper, and therefore more people can afford them. The results of this study share similar view by Onyancha (2010) as highlighted in the following quotation:

"We have got Mobile phones, we have got tablets, radios and all that, those things all brings in information about that is used by these service security, traffic, government which means all the administration staff when people are apply for land, when they apply for emergency communication, health care, education, campuses and building its being enabled through technology". P2

The results indicate that mobile phones, tablets and radios are integrated together to provide information to citizens with regards to emergence, health care, education, campuses and buildings.

6.4 Chapter Conclusion

In this chapter the findings of the qualitative data analysis are presented and discussed. . This was done by presenting and discussing emerged themes emanating from the interviews conducted from Executive members from Metropolitan and Local district municipalities. With consent of the interviewees, the interviews were recorded and were transcribed. Transcripts were uploaded into electronic data analysis tool called Atlas.ti 7 (version 7.0.81). In this analysis, five primary documents, namely P1, P2, P3, P4 and P5 from the interviews were considered. Codes were created using open coding systems. Codes were further grouped into families of codes with the number of incidents (quotations) in each family of codes. Emerging key themes and sub themes was presented and discussed.

CHAPTER 7: E-GOVERNANCE FRAMEWORK FOR LOCAL AUTHORITIES IN SOUTH AFRICA

7.1 Introduction

The previous two chapters presented the results and interpretation of the quantitative and qualitative methods. This chapter will discuss the application of an appropriate e-governance framework for South African municipalities, whether metro or local district municipality. Design of the e-governance framework was informed by inputs which emanate from the results of the survey and from interviews with ICT executive members from the municipalities. ICT executive members are the ones who spearhead ICT and e-governance initiatives in those municipalities by taking into consideration proposed strategies which can improve the use and uptake of using ICT and e-governance in improving services delivery. Literature review from countries where e-governance is doing well, especially in Korea, contributed to the development of this e-governance framework.

7.2 Related literature on ICT framework and its integration in e-governance framework

Paulo (2016) established that the proliferation and enhanced integration of the Internet in daily life and increased opportunities involving ICTs have pushed governments to develop a policy framework to control access to information, services and digital devices and this phenomenon has changed the space and time boundaries of the communication process. Paulo (2016) further observed that the use of technology enables transparency policy initiatives and citizen initiatives to interact with government departments. In developing an e-governance framework, this study therefore used Paulo's (2016) suggestion that political buy-in is required in coming up with corporate governance ICT policy in the form of digital ICT framework which can consider ICT as a full ecosystem with various layers attached to it.

Zheng (2013) likewise described the use of ICT supporting public services, government administration and relationships among citizens, the private sector and the State. In addition, Zheng (2013) explained that e-governance offers five interconnected objectives: high quality and cost-effective government operations, enhancement of public services, increase of citizen engagement, updated information policy framework and administrative and institutional reform. These e-governance objectives were taken into consideration during the designing of a framework for e-governance for South African municipalities to improve service delivery to its citizens. Public-Private partnership and public participation was included in e-governance framework.

When examining credibility of web-based information, Flanagin and Metzeger (2007) identified three credibility aspects to look at: message, site and sponsor. Message credibility depends on aspects of the message itself, such as information quality and accuracy. Site credibility refers to the site features, such as visual aid or amount of information uploaded on the website. Sponsor credibility depends on perceptions of the website sponsor (Flanagin & Metzeger, 2007). This study took cognisance of Flanagin and Metzeger's (2007) input in coming up with a framework for e-governance for municipalities in South Africa of which they highlighted that credibility of website is of paramount importance as one of the principles of good website designed.

7.3 Contribution of participants to e-governance framework for local authorities in South Africa

Participants in this study suggested various strategies, which can be incorporated into e-governance framework for municipalities in South Africa to improve service delivery to its citizens. The following are some of the aspects which were suggested:

- 24/7 website.
- Increased security.
- Education and support.
- Call centres and walk-in centres.
- Managing relationships.
- Improved communication infrastructure.
- Political buy-in.
- Modern technology and right software.
- Shared software and applications.
- Public participation.

Figure 7-1 shows e-governance framework for local authorities to improve service delivery in South African context.

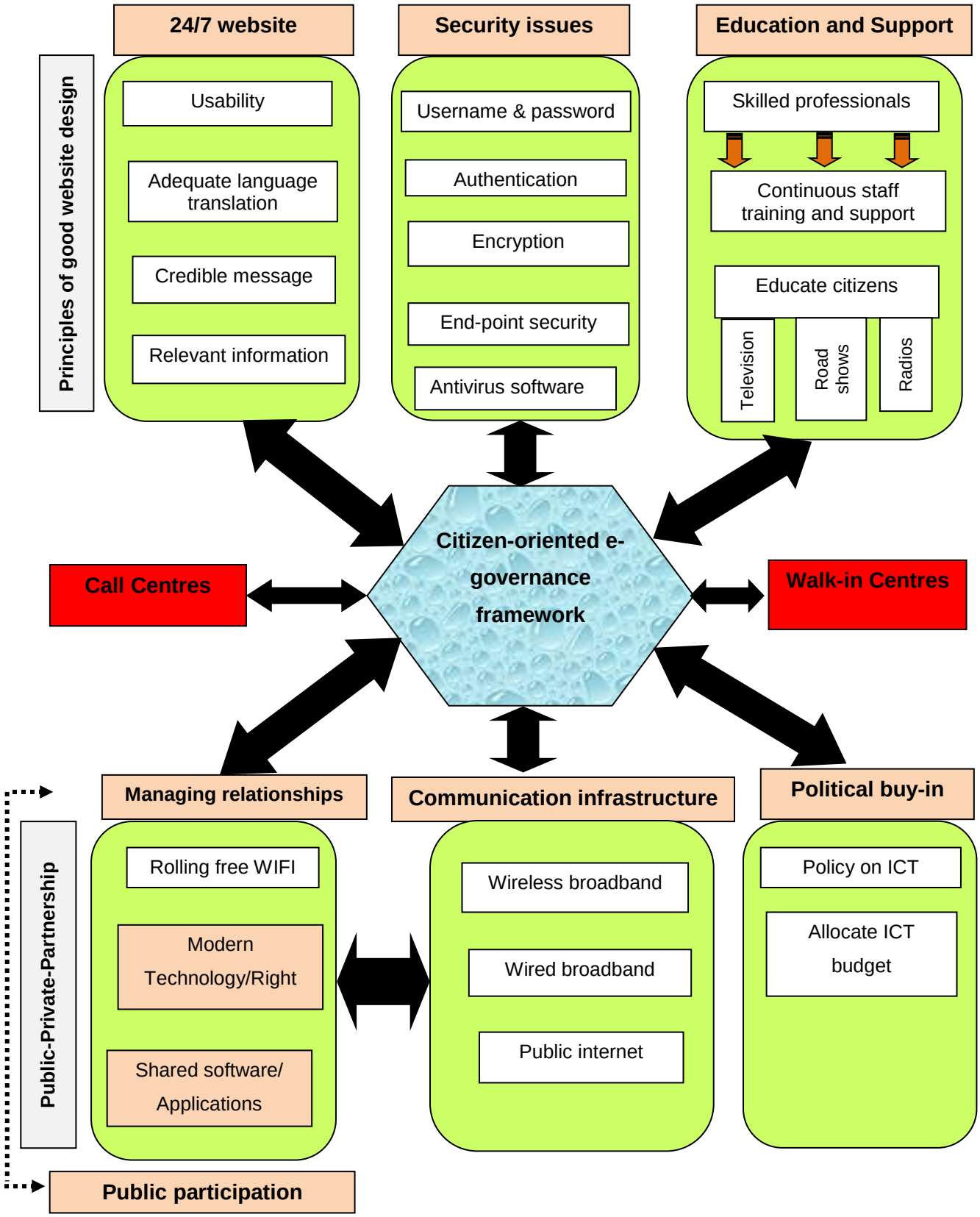

Figure 7-1: e-governance framework for local authorities in South Africa.

7.3.1 24/7 website

The uptake and usage of ICT tools as part of e-governance can be increased by making municipal website available 24/7. Citizens would like to interact and transact with municipality at any time. The developed e-governance framework has incorporated these aspects. Framework is also suggesting that when municipalities are designing their website they should take into consideration good website design principles so that citizens could be encouraged to keep on visiting municipality website for whatever reason.

7.3.2 Increased security

Confidence and trust of citizen to use a particular website is increased if there is security around their personal information and their financial accounts. The designed framework has therefore take into considerations all the security issues such as using unique usernames and passwords, authentication, encryption and end point security. These measures assist to safeguard citizens from identity theft, cyber-crimes and fraud, which subsequently increase the uptake and usage of ICT tools as part of e-governance in accessing municipality services through various platforms of e-services.

7.3.3 Education and support

The framework of this study found it important to have professional municipal staff members who are abreast with the current technological changes. This could be done through staff training, development and support. Computer illiteracy is high in South Africa and therefore municipalities are in a position to educate citizens through various campaigns such as television, radio, road shows and demonstrations on how to use a particular technology or application.

7.3.4 Call-centres and Walk-in Centres

As-Saber, Hossain and Srivastava (2007) are of the opinion that call centre activities within the e-governance framework are likely to ensure better service delivery, improved access to information, enhanced two-way communication and encourage e-democracy through citizen's participation in the decision-making process. As-Saber, et al. (2007) further argued that call centres can reduce face-to-face interaction between citizens and business with public servants; it can also reduce administrative corruption and limit the discretionary powers of public officials. This study therefore regards incorporating call centres and walk-in centres in e-governance framework as fundamental to municipalities in providing services to citizens.

7.3.5 Managing relationships

Municipalities in South Africa on their own are not able to provide e-governance services to its citizens. Offering fast broadband, free WIFI, modern technology and software and shared application require synergism through Public-Private-Partnership. This study therefore suggested involvement of Public-Private-Partnership for successful implementation of ICT as part of e-governance, which requires to be managed well for a win-win situation for all the parties involved.

7.3.6 Improved communication infrastructure

Improved communication infrastructure in terms of broadband, fibre optical, 3G technology, WIFI, servers and switches, routers, mobile radio, microwave and cameras fast internet connectivity, security and surveillance are aspects which influence success rolling out of e-governance for municipalities. Framework for this study includes a communication infrastructure which allows secure, fast and cost effective internet connectivity for citizens to enjoy the benefits of e-governance.

7.3.7 Political buy-in

Political commitment is a major precondition for successful implementation of any e-government initiatives (As-Saber, et al., 2007). However, Karim and Khalid (2003) argued that some governments in developing countries do not have the commitment to implement e-governance and these governments are also poorly equipped to develop and propose successful policies. According to UNDESA (2003), the ability of the government for successful e-governance depends on the availability of funding. Framework for this study advocates for municipal policy makers to develop policies that promote the uptake and usage of ICT by allocating enough budget and resources to meet ICT initiative.

7.3.8 Modern Technology and right software

Technology changes with time and therefore requires municipality to install modern technology in terms of servers, computers, laptops and other hardware devices, as well as updated software. If technology is obsolete it, then performance of business processes and internet connectivity are affected. This study therefore came up with an e-governance framework which calls for municipalities to buy modern technology and software in order to enjoy the benefits of using e-governance.

7.3.9 Shared software and applications

Smaller local district municipalities are not able to afford to buy certain software because of their lower revenue base and therefore they need to rely on software from the bigger metro municipalities or central government. These challenges call for municipalities to share applications and sign user agreements to that effect. This study includes shared application in its framework to accommodate for smaller local district municipalities to benefit from software they could not afford on their own.

7.3.10 Public participation

Involvement of public on issues of e-governance is very important. If public are involved from the beginning they will buy-in to e-governance implementation as they feel to have ownership to the initiative. The study therefore includes public participation in its framework for successful implementation of e-governance by municipalities.

7.4 Chapter conclusion

This chapter discussed the e-governance framework which can be used by municipalities in South Africa to improve service delivery. Aspects which were included in the framework are 24/7 website, increased security, education and support, call centres and walk-in centres, managing relationships, improved communication infrastructure, political buy-in, modern technology and right software, shared software and applications and public participation. The next chapter will discuss conclusions and recommendations for this study.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

The purpose of this chapter is to summarise the findings of the study, especially on the uptake and usage of ICT tools by citizens with theoretical, methodological and practical implications. Also are the major conclusions, limitations of the study and recommendations for future research.

This section presents key conclusions on findings of 3 objectives of the study with regards to the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa, the services offered to citizens by local authorities in South Africa and existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South African context.

8.2 Conclusion of major findings - quantitative

Table 8-1: Objective 1.

Objective 1: Examine and explain the uptake and usage of ICT tools for service delivery by citizens at local government level in South Africa.

8.2.1 Demographic profile

Based on demographic profile in addressing objective 1 in Table 8-1, majority of respondents who are between the age of 31–40 (38.2%) with a diploma (33.2%) as their highest qualification and are from Randfontein Local Municipality (40%) are currently private sector employees (34.5%) and are earning between R5 000 to R10 000 per month (23.5%). Based on these findings and results on demographic profile, it is concluded that demographic profile plays a role in the uptake and usage of ICT tools in accessing government services and that citizens who are educated and earn income are eager and willing to use ICT to access municipal services.

8.2.2 Municipality website system quality

Respondents who participated in the study have same views (all agree) on system quality for their municipality website that they are easy to use, easy to learn, easy to do what I want it to do, does not require a lot of efforts and is not often frustrating. It can therefore be concluded

that municipality websites are well designed for metro municipalities and encourages high uptake and usage of ICT by citizens in accessing municipality services. Whereas for local district municipalities their website are not well developed and can only provide citizens with information which is static in nature.

8.2.3 Motive to seek municipality information

Respondents who participated in the study have the same view of agreeing on their motive to seek municipality information as far as the need to research information, update knowledge on municipality issues, need for municipality service, political issues, state of the municipality address and personal interests are concerned. The findings imply that citizens agree on what motivates them to seek municipality information. Based on these findings and results, it is concluded that citizens are motivated to seek information from municipalities because of various reasons. Municipalities should therefore have such information on their website which is required by citizens for them to keep on visiting municipal website.

8.2.4 Problems encountered when accessing municipality information

Respondents who participated in the study have the same perception on problems encountered when accessing municipality information with regard to poor infrastructure, which makes access difficult and that the information is too difficult to find and do not have search skills and information is complicated to understand. Further challenges are encountered on that the internet usage is expensive, information is located too far, language problem and policy and regulations do not support access to information. Findings imply that citizens encounter serious problems in accessing municipality information. Based on these results it can be concluded that citizens are discouraged to use and accept ICT as part of e-governance as they get frustrated by the challenges they encounter in accessing municipal information from the website.

8.2.5 Relationship between access to internet and identified variables for municipalities

There was no significant difference between access to internet or not with regard to the following variables identified in this study.

- Type of services interested,
- Type of municipal information accessed online,
- Motivation to seek municipality information,
- Problems on accessing municipality,

- Standard of Services, Choice and Consultation,
- Access to online services, Efficiency of Services,
- Convenience and interaction, Accountability, Transparency and Effectiveness.

All had a value smaller than 1.96 and significance levels > 0.05 for City of Ekurhuleni and Westonaria local.

The results shows that, all the tested variables had a value lower than 1.96 at the 0.05 level of significance for City of Ekurhuleni and Westonaria local municipalities. The study, therefore rejects the null hypothesis (H_0b) that 'there is no relationship between access to internet and type of service interested, type of municipal information access online, motivation to seek municipal information, problems on assessing municipality information, standard of service, choice, consultation, access to online services, efficiency of service, convenience/level of interaction, corruption, accountability, transparency/effectiveness in municipality e-governance'. Findings of this study concluded that there is a relationship between access to internet and tested variables for City of Johannesburg, City of Tshwane, Lesedi, Randfontein and Westonaria local district municipalities.

8.2.6 Influence of age on the use of ICT as part of e-governance

Age had no influence on motive to seek municipality information, standard of services, access to online services, efficiency of services, convenience and level of interaction, corruption and transparency and effectiveness, whereas age had a statistically significant influence on choice, consultation and value for money. Findings concluded that age does not determine how citizens make use of ICT in accessing municipal services except for making choice, consultation and for value for money. The post-hoc test for the choice, consultation and value for money did not show any statistically significant differences in the means of the age groups. Based on the post-hoc test, this study concluded that choice, consultation and value for money did not show important difference as far as age group is concerned. The post-hoc test for choice, consultation and value for money showed significant differences between the age groups 20–30 years and 31–40 years, between 41–50 years, 51–60 and 61+ years. Post-hoc test findings imply that choice, consultation and value for money indicate significant differences between various age groups. Based on these findings, this study concluded that the age groups ranging from those who have started working up to the age group nearing their retirement age can make use of the internet and ICT tools to access municipal services.

8.2.7 Influence of level of education on the uptake and usage of ICT

Level of education had influence on change of ownership, payment of fines, payment of water and electricity, refuse and waste, parks and cemeteries and emergency services, online forms, licences and marriages, medical information, sponsorship information and contracts, standard of services, access to online services and efficiency of services, convenience and level of interaction. Based on the findings, it is concluded that level of education had influence on how citizens use ICT to access municipal services. Those who are illiterate have low uptake and usage of ICT in accessing online municipal services, but visit municipal offices for such services.

8.2.8 Influence of occupation in understanding benefits of e-governance

Occupation had no influence on Type of municipal information accessed online 1, Type of municipal information accessed online 2, Motivation to seek municipality information, Problems on accessing municipality information, Convenience and interaction, Middleman interference is removed on tender process, Adjudication of tender is done electronically - no interference of human beings, Cash transactions are eliminated, Accountability, Transparency and Effectiveness. Conclusions can be drawn from the results that occupation does not affect peoples' understanding on the benefits of e-governance in improving service delivery. However, occupation had a statistically significant influence on Type of services interested 1, Type of services interested 2, Problems on accessing municipality information 2, Standard of Services, Choice and Consultation, Access to Online, and Efficiency of Services. Based on the results, it is concluded that not all aspects relating to e-governance could be influenced by occupation. Those people who work in offices are likely to use ICT tools to access municipality services as they have access to internet in their work place.

8.2.9 Influence of income on the uptake and usage of ICT

Income had no influence on Type of municipal information accessed online 1, Motivation to seek municipality information, Problems on accessing municipality information 1, Problems on accessing municipality information 2, Convenience and interaction, Accountability. On the other hand income had a statistically significant influence on Type of services interested 1, Type of services interested 2, Type of municipal information accessed online 2, Standard of Services, Choice and Consultation, Access to online services and Efficiency of Services and Transparency and Effectiveness. Findings of the study concluded that income can affect the uptake and usage of ICT. Citizens with income are likely to use internet and access services from municipalities.

8.2.10 Influence of access to internet in accessing municipality services

Access to internet had no influence on Motivation to seek municipality information, Standard of Services, Access to online services and Efficiency of Services. The results conclude that access to internet has nothing to do with motivation to seek municipal information, standard of service as well as access to online services and efficiency.

On the other hand access to internet had a statistically significant influence on Type of services interested 1, Type of services interested 2, Type of municipal information accessed online 1, Type of municipal information accessed online 2, Problems on accessing municipality information 1, Problems on accessing municipality information 2, Choice and Consultation, Convenience and interaction, Corruption, Accountability and Transparency and Effectiveness. The findings imply that citizens are motivated to access internet to know the services offered by municipalities and to enjoy the benefits which come with online services.

8.2.11 Influence of frequency of using internet in accessing municipality online services

Frequency of using internet had no influence on type of services interested 2 and Problems on accessing municipality information 1. The findings imply that some citizens do not use internet to access municipality services, instead they visit municipality offices should they require a particular service. On the other hand frequency of using internet had a statistically significant influence on Type of services interested 1, Type of municipal information accessed online 1, Type of municipal information accessed online 2, Motivation to seek municipality information, Problems on accessing municipality information 2, Standard of Services, Choice and Consultation, Access to online services and Efficiency of Services, Convenience and Interaction, Corruption, Accountability and Transparency and Effectiveness. Based on the results, it can be concluded that citizens use internet to access municipality services at different times depending on what kind of online services being accessed from municipality.

8.2.12 Influence of motivation of using a particular network when accessing internet

Motivation for using a particular network had no influence on Type of services interested 1, Type of services interested 2, type of municipal information accessed online 1, Motivation to seek municipality information, Problems on accessing municipality information 1, Problems on accessing municipality information 2, Convenience and Interaction, Middleman interference is removed on tender process, Adjudication of tender is done electronically - no interference of human beings, Cash transactions are eliminated, Accountability,

Transparency and Effectiveness. The results indicate that citizens use different network available in the country such as MTN, Vodacom, Cell C, Telkom to access municipality online services despite their costs and availability of network. On the other hand motivation for using a particular network had a statistically significant influence on Type of municipal information accessed online 2, Standard of Services, Choice and, Access to online services and Efficiency of Services. Based on the findings, it is concluded that citizens prefer a particular network to access online service from municipality due to its efficiency in terms of availability of network as well as cost. These findings address research objective 1.

8.2.13 ANOVA – Influence of access to municipality services on type of services, impact of e-governance and e-governance outcome

Access to municipality services had no influence on Type of services interested 1, Motivation to seek municipality information, Problems on accessing municipality information 1, Problems on accessing municipality information 2, Standard of Services, Choice and Consultation, Access to online services and Efficiency of Services. The results imply that access to municipal services is not determined by the type of services which are being offered by municipality, problems in accessing municipal information or efficiency of services as these citizens might not have anything to do with municipality.

On the other hand access to municipality service had a statistically significant influence on Type of services interested 2, Type of municipal information accessed online 1, Type of municipal information accessed online 2, Convenience and interaction, Corruption, Accountability and Transparency and Effectiveness. The findings conclude that citizens who access municipality services are concerned about type of services offered by municipality and the information which is found on municipality website as well as issues around accountability, transparency and efficiency.

8.3 Conclusion of major findings – qualitative

8.3.1 Presence of website

The findings from all the five interviewees indicated that their municipalities have website. Metros such as City of Johannesburg have separate website dedicated for citizens which are dynamic in nature. Local district municipalities have static websites which disseminate information to general public. Findings of this study established that website for municipalities are used for communication. Results of this study also revealed that online financial information which is transactional in nature is available in metro municipalities as compared to Local district municipalities where statements and billing are offered online.

Results of this study revealed that the number of users who register to use municipality website is far less than the numbers of Seoul in Korea.

Results of the study imply that municipalities in South Africa have functional websites which provide information to its citizens. The results suggested that citizens are interested in general information, financial information and bill payments when they access municipality website in metro municipalities. In local district municipalities citizens visit municipal offices to get statements and general information as their websites are not yet developed to do online transactions such as bill payments.

Based on these findings and results, it is concluded that Local district municipalities are still at early stages of e-governance growth (Siau & Long, 2005). Local district municipalities have presence of website which is static in nature that only provides information to its citizens. On the other hand metro municipalities are at advanced stage of e-governance in transforming its services to citizens which is transactional and are moving towards transformation to e-democracy.

8.3.2 Uptake and usage of ICT

The study found that citizens should be made aware of the advantages associated with ICT as a way of encouraging them to uptake and use ICT tools. Resistance of citizens not to make payment through online systems is because they don't trust the system as it is open to identity theft, fraud and cyber-crime. Results of this study revealed that municipalities need to put in place structures that educate community ICT skills so that they can understand how to use ICT when accessing municipal services. This study established that South Africans are adopters of technology, although some are at different stages of adoption. Those who first adopt technology are the early adopters and those who took time to accept and use technology are the laggards. Municipalities are taking initiatives to roll out free WIFI. Free WIFI is available in public hot spots whereby citizens are required to register to access public WIFI. This study found that municipalities need to partner with banks and government departments in order to gain trust from citizens. Municipalities are putting efforts to promote social media as a tool for effective communication, which ultimately promote the uptake and usage of ICT.

Findings of this study therefore concluded that in order for citizens to accept and use ICT tools to access municipal services, citizens should have trust with the municipal system and should put public hot spots with free WIFI where citizens can have access to internet and through different social media platforms.

8.3.3 Hindrance to use of online services

Results of this study found that there is a challenge of unavailability of free WIFI and cost of data is high, therefore few people can afford it. Results indicate that rolling out of ICT as part of e-governance in municipalities could be successful if both public servants and its citizens are computer literate. The study revealed that not all citizens do not have smart phone for accessing internet, therefore citizens are limited in accessing municipal services through such devices. Results of the study revealed that website for local district municipalities are not user friendly and some have outdated information and dead links.

Results of the study show that internet access is a challenge and requires investment. This study revealed that ageing of equipment and application affects the implementation of ICT initiatives as part of e-governance. This study found out that municipalities are not working alone in providing online service. They are doing this with the help of different service providers in rolling out free WIFI and to provide platforms for online payment to citizens. The findings suggested that municipalities have to work hard in order to remove the barriers that hinder the use of online services by the citizens.

This study therefore concluded that there are several factors that hinders the use of online services such as unavailability of free WIFI, public servants and citizens computer illiteracy, lack of smart phone which can connect to internet, unfriendly website, absolute equipment and application.

8.3.4 Solutions to hindrance on online services

This study established that availability of free WIFI through public hot spots promoted the uptake and usage of online services offered by municipalities. Results of this study found that education and training plays an important role in promoting the uptake and usage of ICT as part of e-governance. Findings of this study indicated that smart phones are still expensive for the citizens. Smart phones can be imported from other countries, which is affordable to the majority of citizens. Study established that free WIFI and usability and easy access to internet is of paramount important for the successful implementation of e-governance. This study found out that municipalities can enjoy the benefit of using ICT in improving service delivery through modernisation of ICT by keeping abreast with changes in technology.

Findings indicated that municipalities are making efforts to renovate their website and applications so that it becomes usable with relevant information. The findings of the study suggest that municipalities on their own cannot be able to provide the necessary broadband

due to high costs. Municipalities therefore requires to share cost through Public-Private-Partnership and given that municipalities lacks some skills which might be required to roll out fibre for internet connectivity. The results of this study indicated that municipalities in South Africa are putting effort on security measures, although it is not at high level as is seen with e-Seoul security measures. The results indicated that ICT initiatives are facing challenges due to budget constraints and there is need to invest in ICT for its success.

Based on the findings and results on the solutions that hinders online services, it can be concluded that municipalities should make available free WIFI through public hot spots, educate and train civil servants and citizens, importing smart phones from other countries such as China, modernisation of ICT equipment and software, Public-Private-Partnership to roll out broadband for internet connectivity, provide tight security measures and to invest in ICT.

8.4 Conclusion of major findings - quantitative

Table 8-2: Objective 2.

Objective 2: Assess and explain the services offered to citizens by Local Authorities in South Africa.

8.4.1 Types of services offered by municipalities

Based on objective 2 in Table 8-2, respondents who participated in the study have the same understanding on the Types of services 1 offered by their municipalities as far as drivers, business licences, bill statements, payments of rates, taxes, fines water, electricity is concerned. Respondents who participated in the study have the almost the same view on Types of services 2 offered by their municipalities as far as information on policies and land, refuse, waste management, parks and cemeteries and emergency management services is concerned.

It is therefore concluded that all the services identified by respondents were desirable which makes citizens to visit municipality website or municipality offices. It therefore implies that citizens keep on using ICT tools as part of e-governance to access municipality services.

8.4.2 Standard of Services

Respondents who participated in the study have the same knowledge on standard of service as far as providing reliable online services, providing services at the time it promises, gives

prompt online services to citizens, website designed with citizen's best interest at heart, website designed to satisfy the needs of citizens, type of online services meet the needs of citizens and is accurate and up-to-date is concerned. Conclusions can be drawn from these results that municipalities offer effective standard of service to citizens where e-governance is at an advanced growth stage such as metro municipalities.

8.4.3 Access to online services

Respondents who participated in the study have the same view on promotion of access and use of online services by municipality, online services are better than manual services and the feedback on enquiry made through online. This study concluded that municipalities effectively promote access to the use of online services and offer better online services than manual services to the citizen. Online feedback is also provided to their citizens through various platforms. This is witnessed in metro municipalities where online services are provided.

8.4.4 Efficiency of services

Respondents who participated in the study have the same perception on efficiency of services on offering online services to improve the speed on delivering services, Efficiency of services encourages citizens to pay their bills and queuing for services is the thing of the past. Results imply that citizens were very satisfied with efficiency of services as provided by municipality. Findings further concluded that online services save citizens' time in doing business with municipality.

8.5 Conclusion of major findings – qualitative

8.5.1 Interventions in speeding online services through e-solution

This study established that municipalities are developing various applications that assist indigent citizen in accessing online services. Various online payments channels are made available especially in metro municipalities where e-governance growth is at advanced stage. Findings of this study established that local district municipalities do not have applications that support transactional activities such as online payment channels. However, there are applications available which allow citizens to view and print statements. Findings of this study revealed that metro municipalities are in a drive to promote e-health solution so that citizens are able to book appointment to see doctors online or to check for the availability of medicines

Based on these findings and results on intervention in speeding online services through e-solutions, it is concluded that municipalities are having applications for indigent citizens. Metro municipalities have online payments channels. Local district municipalities do not have applications that support online transactions. Metro municipalities are in a drive to promote e-health solutions to support Department of Health's vision and mission.

8.5.2 Services offered by municipalities

This study found that municipalities offer three different kinds of services, namely financial services, infrastructure services and social and community services. This study also established that some important services which are offered by municipalities are call centre service and walk-in-centre in an effort to improve service delivery to citizens. The findings show that not every citizen can afford to buy data bundles in order to access online services offered by municipalities. Instead, some citizens rely on call centres and public walk-in-centres to access internet in order to transact with municipalities. Based on the findings and results on services offered by municipalities, it is concluded that a variety of services are offered by municipalities and some are offered through call-centres and walk-in-centres.

8.5.2.1 Online services offered by municipalities

The study revealed that establishment of the municipals' e-procurement service, bidding for government contracts and payment for services or supplies takes place online and enhances transparency and effectiveness of tax administration for both individuals and businesses. The results found that metro municipalities in South Africa are moving towards becoming smart cities with various applications in place to spearhead such initiatives. In local district municipalities the initiative is still behind due to limited financial resources and lack of skills to implement that. Results of this study indicated that e-heath solutions in municipalities are there to improve health delivery system in South Africa in collaboration with the Department of Health.

Results of this study indicated that ICT plays an important role in managing properties as far as plan submission, checking progress and valuation of properties is concerned. Findings of the study showed that municipalities which are at high maturity level of e-governance are able to offer Customer Relation Management Services such as metro municipalities which allow its citizens to access services online as part of citizen service transformation. Based on these results on online services offered by municipalities, it is concluded that metro municipalities are doing well in offering online services in comparison to the local district municipalities. This disparity is caused by lack of investment in ICT in local district

municipalities.

8.6 Conclusion of major findings – Quantitative

Table 8-3: Objective 4.

Objective 3: Examine existing e-governance and e-government theories and practice in order to draw lessons from where it is successful in order to develop e-governance framework for service delivery for local authorities in South Africa.

8.6.1 Convenience and level of interaction

Based on objective 3 in Table 8-3, respondents who participated in the study have the same perception on convenience and level of interaction on e-governance promote services to be offered 24/7, distance and time is not an issue with e-governance, e-governance promote interaction between citizens and municipality and e-governance promotes interaction between municipality and its stakeholders. Findings implied that citizens are very satisfied by offering convenience services with high level of interaction. This study concluded that municipalities allow stakeholder participation through various interactive platforms especially with metropolitan municipalities which was built from the concept of Chadwick and May (2003) Participatory Governance model as discussed in Chapter 3.

8.6.2 Corruption

Respondents who participated in the study have the same view on corruption on middleman interference is removed, Adjudication of tender is done electronically - no interference of human beings and cash transactions is eliminated. The results concluded that corruption can be addressed by promoting e-governance in municipalities as advocated by Chadwick and May (2003) in their Disciplinary Model which recognizes that e-government is not just about efficiency, service delivery, and participation, but also about embedding rules to discipline citizens and providers, and to enforce welfare-increasing policies which was also echoed by Nath (2005) in his Critical Flow Model in which the application of the model involves making available information on corruption (by an appropriate legal authority) of a particular government ministry or government officials.

8.6.3 Accountability

Respondents who participated in the study have the same view on accountability on implementation of e-governance by municipalities which can make them answerable of their action and decision towards citizens, implementation of e-governance by municipalities makes them answerable in their actions and decisions to the stakeholders and I am able to communicate with government officials through the government website/email/internet. Conclusion of the results of this study indicated that for the successful implementation of e-governance in local authorities, municipalities need to incorporate the aspect of accountability in their framework that will check decisions made by municipalities in delivering services to citizens.

8.6.4 Influence of website security on the use of ICT in accessing municipality services

Security of the municipality website had no influence on Type of municipal information accessed online 1, Problems on accessing municipality information and Corruption. Findings imply that citizens are not worried about security on municipality website. This could indicate that these citizens are not actively involved in transacting online with municipality. On the other hand, security of municipality website had a statistically significant influence on Type of services interested 1, Type of services interested 2, Type of municipal information accessed online 2, Motivation to seek municipality information, Problems on accessing municipality information 2, Standard of Services, Choice and Consultation, Access to online services and Efficiency of Services, Convenience and Interaction, Accountability and Transparency and Effectiveness. The results of this study concluded that security is an issue to those citizens who access online services from the municipality.

8.7 Conclusion of major findings – qualitative

8.7.1 Citizens Focus Service Plan

The results revealed that municipalities have Citizen Focus Service Plan in their strategic documents in the form of Citizen Focus service delivery with the objective of increasing the relationship between government and citizens. Based on the findings and results on Citizen Focus Service Plan, it is concluded that municipalities are committed in putting citizens first in delivery services by taking contribution of the Interactive-Service Model as a consolidation of the earlier digital governance models which opens up avenues for direct participation of individuals in the governance processes.

8.7.2 Security measures

The results indicated that citizens' personal information is vulnerable to security threats, such as identity theft and fraud if proper security measures are not in place. Findings of this study indicated that citizens have gained confidence with municipality systems if their security concerns are guaranteed which can come in the form of unique usernames and passwords. This study established that citizen information is vulnerable to some security threats and therefore municipalities are putting various measures in place such as secure socket layer.

Findings of this study concluded that security measures are being put in place in metro municipalities as they are transacting online as compared to the local district municipalities where they are not yet transacting online on a full scale basic. The results also imply that laws should be able to protect citizens through the use of trusted software which is guaranteed by the industry security standard.

8.7.3 Advantages and disadvantages of ICT as part of e-governance

8.7.3.1 Advantages of ICT

The study established that municipalities seek to improve efficiency and effectiveness in the manner in which services are delivered to citizens by using ICT tools as part of e-governance. Results of the study indicated that citizens would want to have access of municipality services 24/7 - at any given time and it will save them of time and cost. The results revealed that citizens are concerned with convenience when accessing municipality services from municipality. Convenience is one of the aspects which encouraged citizens to pay their bills to municipality as they will be seeing value in the services they are getting.

The results showed that municipal objective is to reduce cost through the use of ICT in their operations in delivering service to citizens. The findings indicated that the essence for municipalities to embark on e-governance is to improve service delivery to its citizens through various ICT tools. The results revealed that if statements sent to clients are free from errors, citizens are encouraged to pay their bills and municipalities are able to provide services to citizens.

The results indicated that for municipalities to deliver efficient and effective services to its citizen, internal processes in terms operating systems and applications software should be up to date. Results established that municipalities are vulnerable of losing their data through theft, fire and viruses. Cloud computing could make it possible to recover lost data which is

saved on internal hard drive and other external medium storage such as compact disk, memory stick, external hard drives etc.

Based on these findings and results on the advantages of ICT, it is concluded that municipalities could capitalise on the advantages of ICT as part of governance to encourage citizens to use ICT tool to access municipality services. On the other hand, municipalities themselves should take advantages of ICT to improve their business processes thereby improve service delivery to the citizens.

8.7.3.2 Disadvantages of ICT

The results indicated that although citizens are willing to take and use ICT, they have a challenge in that they lack computer skills to access online municipal services. The findings revealed that municipalities need to invest in ICT infrastructure for the successful rolling out of ICT projects. Results of the study indicated that metro municipality and local district municipalities need to prioritise ICT for the promotion of uptake and usage of ICT by citizens. Results of this study hold that if staff and citizens are informed of the benefits of ICT as part of e-governance, their uptake and usage will increase. Findings of the study imply that citizens are not encouraged to take and use ICT initiatives as part of e-governance until and unless security issues by municipalities are addressed.

The results imply that if civil servants lack computer skills they will resist the change which is brought by technology. The results of this study imply that municipalities are faced with challenge of network availability which therefore affect the uptake and usage of ICT as part of e-governance in accessing municipality services. Findings of this study indicated that load shedding and cables theft is a challenge in municipalities which affects the uptake and usage of ICT.

Based on the results of this study on disadvantages of ICT, it is concluded that municipalities are faced with several challenges which need to be overcome with assistance from central government and to partner with other players.

8.7.4 Staff buy-in and support

The study established that the use of ICT as part of e-governance is no longer a threat to staff as they have appreciated the benefits associated with it. However, results of the study revealed that technological change could not be easily embraced by staff members and citizens as they fear of losing their jobs and not trusting the new technology. The findings indicated that introduction of e-governance in municipalities require to have a change in

management plan for their e-governance strategy as it affects human resources and business processes. Based on the findings on staff buy-in and support, it is concluded that that staff members need to appreciate the benefits of implementing e-governance and should not see that as a threat to their jobs.

8.7.5 Citizen relationship

The findings indicated that the essence of e-governance is to improve citizen relationship. This is done by open the channels of communication and giving timeous feedback to citizens. The results indicated that municipality gained trust from its citizens by providing them with accurate information of which they can make informed decisions. The findings revealed that citizens can be informed of the importance of e-governance through demonstrations and various campaigns which can create awareness of the usability of online services. The results showed that reliable e-services can only be achieved by increasing the bandwidth which makes citizens to have access to internet without any disruptions or interferences. Based on these results, it can be concluded that citizen relationship can be promoted through various means of which municipalities need to make use of all of them if it is to maximise its relationship with the citizens.

8.7.6 Strategies to improve online service delivery

Results of this study indicated that 24/7 web service allows citizens to access municipal services at the comfort of their homes at any given time thereby enhancing citizens' trust with their municipality. The findings from this study imply that municipalities are moving towards improving online service delivery by having strong communication infrastructure. The results indicated that municipalities are trying to bridge digital divide which has been in existence for a long time by increasing communication infrastructure in both metros and local district municipalities so that citizens can have access to internet and be able to access municipal online services.

The findings showed that without political buy-in in e-governance initiatives, the project of ICT in municipalities will not succeed. Results of the study reveal that municipalities through its policies are making provisions to establish public internet access to citizens so that they can be able to access municipality services. Result of this study asserts that relations between government and its different stakeholders should be managed if municipal are to enjoy the benefits of using ICT as part of e-governance.

The results suggested that if corruption is not addressed it can affect the implementation of ICT and e-governance. The findings reveal that without modern ICT infrastructure and

software there won't be any guarantee that e-governance initiatives will succeed. Results of this study indicated that in comparison to developed countries such as Korea South African Municipalities are still behind in security as personal information for citizens is stolen or abused by perpetrators.

Smaller municipalities cannot afford big systems and applications, therefore need to share applications with bigger municipalities. The results imply that local district municipalities are struggling to fully implement e-governance initiatives as compared to metro municipalities. Metro municipalities have large resource base in the form of rates and taxes which they charge citizens as compared to local district municipalities whose revenue base is constrained due to poor revenue collection because of defaulters who are affected by high levels of poverty and unemployment. Results indicated that in order for ICT and e-governance to be successful staff members should be skilled first so that they can also pass such skills to citizens.

Based on the results and findings on strategies to improve online service delivery, it is concluded that e-governance framework for local authorities in South African context was developed with ten dimensions which feeds into the citizen focus e-governance framework as discussed in Chapter 7.The following are the ten dimensions;

- 24/7 website
- Increased security
- Education and support
- Call centres and walk-in centres
- Managing relationships
- Improved communication infrastructure
- Political buy-in
- Modern Technology and right software
- Shared software and applications
- Public participation

8.7.7 Corporate governance ICT framework

Findings of this study imply that municipalities, whether metro or local district are having an ICT framework although they are at various implementation stage. This study established that e-governance should be looked at through the lens of full ecosystem that enables citizens, business and SMEs to interact with government using the full range of electronic media. The framework which was developed in this study incorporated such aspects as it

address research objective 3.

8.7.7.1 Full ecosystem layers

Findings of this research established that application layer allow citizens to access municipality services through various applications. Findings of this study reveal that South African municipalities are at advanced stage, especially with metro municipalities in providing advanced communication platforms such as cameras and sensors as part of surveillance to monitor crime in the city. Results of this study indicated that mobile phones, tablets and cameras play a crucial role in the uptake and usage of ICT as part of e-governance in the analytical layer. The results indicated that mobile phones, tablets and radios are integrated together to provide information to citizens with regards to emergence, health care, education, campuses and buildings.

Based on these findings and results on the strategies to improve e-governance to improve online service delivery, it is concluded through various applications and integration of other gadgets such as cameras and sensors, e-governance framework for local authorities to improve service delivery was developed.

8.8 Recommendations

This section addresses the third research objective by recommending e-governance framework for local authorities in South Africa. Municipalities that envisaged improving service delivery to its citizens should utilise effective ICT tools as part of e-governance practices. Several researches in this study confirmed that implementation of e-governance by municipalities is more likely to improve business model, processes and service delivery to its citizens. The findings indicate that in this information age, it is highly recommended for leaders in local authorities in South Africa to engage in the following e-governance practices:

- Municipalities should offer 24/7 web service which allows citizens to access municipal services at the comfort of their homes at any given time. This enhances citizens' trust with their municipality.
- In order for local authorities to move towards improving online service delivery through strong communication infrastructure, municipalities should bridge digital divide which has been in existence for a long time by increasing communication infrastructure in both metros and local district municipalities for citizens to access online services through the internet.

- Municipalities should have political buy-in in e-governance initiatives if ICT project is to be successful.
- Municipalities through its policies should make provision for the establishment of public internet access to its citizens through public hot spots to allow citizens access to municipal online services.
- Relations between government and its different stakeholders should be managed if municipalities are to enjoy the benefits of using ICT as part of e-governance.
- Corruption and nepotism in municipalities should be addressed by employing well qualified personnel to implement ICT and e-governance initiatives.
- Modern ICT infrastructure and software should be in place in municipalities in order to guarantee successful implementation of e-governance initiatives.
- South African municipalities are still behind as compared to security in developed countries such as Korea as personal information for citizens is stolen or abused by perpetrators. Municipalities should therefore prioritise security concerns by putting in place tight authentication and encryption measures.
- Smaller municipality cannot afford big systems and applications and therefore need to share applications with bigger municipalities.
- Due to citizen requirements to become computer literate in this information age, Authorities need to make computers and information technology subjects compulsory in the school curriculum system from an early age of primary school to get the learners to make first contact with technology from an early age.
- For ICT and e-governance to be successful, staff members should be skilled through continuous training and support.
- Municipalities whether metro or local district should have corporate governance ICT framework/Digital ICT framework in its Integrated Development Plan (IDP).
- e-governance should be looked through the lens of full ecosystem that enables citizens, business and SMEs to interact with municipalities using the full range of electronic media.

8.9 Research contribution

This research addresses the knowledge gap in the low uptake and usage of ICT by citizens at local government level in South Africa. This study provides a theoretical and practical insight on factors why local authorities offering poor service delivery to their citizens in South Africa. This study assesses the relevance and validity of e-governance and e-government theories and practice in service delivery in South Africa. This study developed e-governance framework for improving service delivery for local authorities in South Africa.

The overall study contributes to the body of ICT knowledge by unpacking ICT aspects and tools which can be used by local authorities in improving service delivery in South African context. Through literature review and interviews conducted, it was established that South African municipalities had a tendency of copying and pasting e-governance frameworks from developed countries such as South Korea. When such e-governance framework is applied in South African context they deem to fail because these countries are at different economic growth stages. This study therefore contribute to the body of ICT knowledge by coming up with e-governance framework for local authorities in South African by taking into consideration ICT challenges which the country is facing such as digital divide, computer illiterate, cost of data, poor ICT infrastructure.

8.9.1 Theoretical contributions

This study developed e-governance framework for improving service delivery in local authorities in South Africa. The framework was developed by taking into account input from literature review from Chapter 2 and existing theories of e-governance from Chapter 3 and from recommendations and suggestions made by participants during data collection in Chapter 4 on how e-governance can be utilised to improve service delivery in South African context. Branding of various inputs from literature review, existing theories of e-governance and participants made it possible to develop a unique e-governance framework for local authorities in South African context.

Contribution in the form of citizen-oriented e-governance framework was made by incorporating ten unique aspects which improves service delivery in South African context. The ten unique aspects which have contributed to the theory of this subject is found in the e-governance framework as discussed in previous chapter.

8.9.2 Methodological contributions

Previous studies on e-governance have been done using either qualitative method or quantitative method. For qualitative research method there was no objective verifiable results and for quantitative research there was no human perception and belief on the aspects understudy. This study however used mixed method as discussed in chapter 4 in understanding how e-governance can improve service delivery in local authorities in South African context by providing a greater breadth of perspectives around the usage of ICT tools as part of e-governance. This approach has improved the results of this study by counterbalancing or compensating for the biases, limitations and weaknesses of a one approach method, by mixing it with a method belonging to the other approach (Fidel, 2008).

A mixed methods approach has been used for this study for triangulation purposes, sought convergence and divergence across qualitative and quantitative approaches (Greene, et al., 1989). This study triangulated data collection methods by using interviews and self-administered questionnaires. The study also triangulated models or theories of e-governance models. Triangulation of data sources which include data from citizenry of Municipalities and Executives members from Gauteng Province was done.

8.9.3 Practical contributions

Implementation of e-governance framework in local authorities will greatly affect municipal business models and processes and thereby affect the organisation structure. The implementation of e-governance through the use of ICT tools will require organisational change and will ultimately affect human resources of the organisation as municipality has to down size its staff and other staff members has to be redeployed or reassigned thereby drastically reduce the overall labour cost for municipalities. The following are the identified practical advantages brought about by implementing e-governance initiative in municipalities as discussed in chapter 6.

- Efficiency and effectiveness of services.
- 24/7 services.
- Convenience.
- Cost reduction.
- Improve service delivery.
- Reduction of errors.
- Speed operations.
- Cloud storage.

Councillors of municipalities can have political buy-in by developing policies which promote the usage and uptake of ICT through the Municipality Integrated Development Plan (IDP). The developed e-governance framework for municipality is in support of the ICT Digital Framework which municipalities should have in order to promote e-governance in local authorities.

8.10 Research limitations

This research was carried out for municipalities in Gauteng Province. The research could have been extended to other province but due to time and financial constraints it did not happen. One major metro municipality – City of Tshwane which was supposed to participate

in this study did not respond to the researchers' request to have its executive members interviewed. However, their non-response and participation did not affect the outcome of this study as citizens who access municipal services managed to participate in this study through questionnaires. The researcher managed to gather data from two other major metro municipalities which are City of Johannesburg and Ekurhuleni with similar status with the one which did not participate. The results therefore can be generalise and replicate to the non-participant metro municipality and to other similar metro municipalities with the same status across South Africa. This study managed to interview executive members who are the drivers of ICT from the identified municipality.

Although this study aimed to make a significant contribution to the body of knowledge on the e-governance framework for improving service delivery in local authorities in South Africa, certain areas still need to be explored or expanded. Based on the outcomes of this research, the following limitations are stated and opportunities for future research on e-governance are outlined:

This study interviewed top level management from municipalities who are the drivers of the e-governance. This was a limitation of this study as it was possible to involve all the levels of staff within municipality organisational structure. The results of this study could have been different had it been that it included all the levels of staff members within the structure of municipalities. Involvement of other staff members could have provided a different picture and results on the e-governance practices. This study however managed to provide some insights on how e-governance can improve service delivery to citizens. Future research should include all the level of staff in municipal hierarchical structure to get full understanding of their perception on the use of e-governance to deliver services to citizens.

The study selected municipalities from Gauteng Province. This province was selected because it is considered as the economic hub of South Africa and is often the first choice of destination by job seekers across the country. While being the smallest province, it is also most populous, being 12 272 263 people (Local Government, 2016). It is a province with a unique, African character, world-class infrastructure in the fields of telecommunications, transportation, water and power, and with globally-competitive health care and educational facilities. The study of e-governance on other provinces could have given other insights to the use of ICT tools as part of e-governance to improve service delivery in local authorities. It might be worth to pursue similar studies in other provinces which are not regarded as economic hub of South Africa and draw comparative analysis of e-governance efforts in municipalities in these different provinces. Future studies could be carried out in other

provinces to verify to what extent e-governance practices are being used by municipalities to improve service delivery to its citizens.

The developed e-governance framework for municipalities is a one-size-fit-all. Further studies should look at separating e-governance framework for metro municipalities and Local district municipalities as they have different communication infrastructure, financial base and ICT expertise.

8.11 Areas of further research

This research looked at framework for e-governance to improve service delivery for local authorities in South Africa by answering research questions on;

(i) Why is there a low uptake and usage of ICT by citizens at a local government level in South Africa?

(ii) Why are local authorities offering poor service delivery to their citizens in South Africa?

(iii) How can e-governance and e-government tools be applied in developing a framework for improving service delivery for local authorities in South Africa?

Further research should be carried out on the following areas;

- Patterns on the uptake and usage of ICT by citizens at a local government level using statistical modelling.
- Critical evaluation of services offered by local authorities to their citizens by benchmarking it with local authorities in other African countries.
- Establishing how cloud computing and big data can be integrated in the developed framework for improving service delivery for local authorities in South Africa.

8.12 Summary of the chapter

The chapter discussed the conclusions from the results of the demographic profile. The major findings for municipality website system are summarised, namely quality, motive to seek municipality information, problems encountered when accessing municipality information, relationship between access to internet and identified variables for each municipality, influence of access to internet on the factors, influence of frequency of using internet on the factors, influence of motivation of using a particular network on the factors, influence of access to municipality services on the factors were presented and discussed.

Conclusions of major findings for qualitative on presence of website, uptake and usage of ICT, hindrances to use of online services, solutions to hindrance on online services were presented and discussed. Conclusions of major findings for quantitative results on types of

services offered by municipalities, standard of services, access to online services, efficiency of services and influence of municipality on the factors was discussed.

Conclusion of major findings for qualitative results on interventions in speeding online services through e-solutions, services offered by municipalities, online services offered by municipalities were discussed and their conclusions. Conclusions on major findings for quantitative results on convenience and level of interaction, corruption, accountability, security of municipality website on the factors and were discussed. The chapter proceeded by discussing conclusion of major findings on qualitative on Citizens Focus Service Plan, security measures, advantages of ICT, disadvantages of ICT, staff buy-in and support, citizen relationship, strategies to improve online service delivery, corporate governance ICT framework, Full ecosystem layers.

This chapter wrapped up by discussing recommendations and its implications for practice, limitation and implications for future research, research contribution in the form of theoretical contributions, methodological contributions, and practical contributions. The chapter ended by discussing research limitation for the study.

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ANNEXURE A: A SURVEY QUESTIONNAIRE

E-governance for improving service delivery in local authorities in South Africa.

SECTION 1: Demographic Information

00 Gender ☐ Male ☐ Female **01 Date** Click here to enter a date.

03Age ○ 20-30 ○ 31-40 ○ 41-50 ○ 51-60 ◉ 61+

04Education 05Occupation

☐ Never Attended school ☐ Government employee

☐ Primary School ☐ Private sector employee

☐ Matric ☐ Self employed

☐ Diploma ☐ Academician

☐ Degree ☐ Pensioneer

☐ Masters Degree ☐ Student

☐ Phd ☐ Other Specify_____

06Monthly Gross Income

☐ Less than R5000 ☐ R5000-R10000 ☐ R10001-R20000 ☐ R20001-R30000

☐ R30001-R40000 ☐ R40001-R50000 ☐ R50001-R60000 ☐ R60001 and above

☐ Not Applicable ☐ I do not want to answer

07**Your municipality**

☐ City of Ekurhuleni ☐ City of Johannesburg ☐ City of Tshwane

☐ Lesedi Local ☐ Randfontein Local ☐ Westonaria Local

☐ Other Specify_____

==========

SECTION 2: Internet usage and connectivity

08Do you have access to the internet?

☐ Yes ☐ No

09How often do you use the internet?

☐ Almost always ☐ Sometimes ☐ Every once in a while

☐ Rarely ☐ Never

10How do you get access to the internet?

☐ WIFI at work ☐ Land line at work ☐ WIFI at home

☐ Land line at home ☐ Public hotspots ☐ Mobile modem

☐ Cell phone ☐ Internet cafe ☐ Not applicabe

11Which gadget do you use to gain access to the internet?

☐ Laptop ☐ Cell phone ☐ Smart phone ☐ Tablet ☐ Desktop

☐ None ☐ None

12Which network do you use to connect to the internet?

☐ MTN ☐ Vodacom ☐ Telkom ☐ Cell C ☐ None ☐ Others Specify ____

13Why do you select the above network?

☐ Fast in connection ☐ Not expensive ☐ Both

☐ Only network available to me

14 Is your Municipality websites secure?

☐ Extremely unlikely ☐ Unlikely ☐ Neutral ☐ likely

☐ Extremely likely ☐ I don't know

==========

SECTION 3: Municipality Services

15How do you get access to municipality services?

☐ Municipality website ☐ Visit Municipality offices ☐ Ward Councillor

☐ Other Specify_____

16 Factors affecting the use of electronic governance information.

To what extent do you agree or disagree about the following facilitating conditions for you to use municipality information about services offered from the internet/website? (Tick one box against each statement - Key: 1 = Strongly Disagree; 2 = Disagree; 3 = Undecided; 4= Agree; 5= Strongly Agree

System quality					
Municipality website is easy to use.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Municipality website is easy to learn.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I find it easy to get this web site to do what I want to.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Using municipality website does not require a lot of effort.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Using municipality website is not often frustrating.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Information quality					
Accuracy: The website provides accurate information.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Reliability: The website provides reliable information.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Relevancy: The website provides relevant information.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Easiness: The website provides easy-to-understand information.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
The information provided by this website is in a useful format.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Information provided by this website meets my needs.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

17What services will you be interested in on the municipality website?

(Please tick the appropriate box; 1= Very Interested; 2= Somewhat Interested; 3= Neutral; 4= Not Very Interested; 5= Not at all interested)

Type of service	**Rating**				
Drivers licence	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Business licence	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Bill statement	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Payment of rates and taxes	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Information on policies	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Land information	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Change of ownership	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Payment of fines	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Payment of water and electricity	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Refuse and waste management	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Parks and cemeteries	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Emergency management services	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

18 When you use the internet to access online services information, what type of municipal information do you access? Please tick the appropriate answer; 1=Very Important; 2=Important; 3= Neutral; 4=Less Important; 5= Not Important.

Renewing driver's license	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Voter registration	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
National park information and reservations	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Voting on the internet	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Information on value added tax (VAT), public pension fund etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online payments	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online forms (downloading and submission)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Licenses for example driving, death and marriage certificates (information and services)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Medical information and services	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Sponsorship information and services	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Contacts of various government offices	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

19 What motivates you to seek municipality information? Please use the following criteria 1= Strongly Disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly Agree

A need for research information	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
To update my knowledge on municipality issues	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
A need for municipality services, for example licences, tender documents, certificates, medical services, scholarships etc.	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Political issues	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
State of the municipality address	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Personal interests	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Others	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

20 What problems do you encounter when you try to access this information? Tick the appropriate answer following the criteria below: 1=Not at all a Problem; 2=Minor Problem; 3= Moderate Problem; 4= Serious Problem

Poor infrastructure makes the access difficult.	☐ 1	☐ 2	☐ 3	☐ 4
The information was too difficult to find.	☐ 1	☐ 2	☐ 3	☐ 4
I do not have search skills.	☐ 1	☐ 2	☐ 3	☐ 4
The information is complicated to understand.	☐ 1	☐ 2	☐ 3	☐ 4
The internet usage is expensive.	☐ 1	☐ 2	☐ 3	☐ 4
Important information on municipality website is located far.	☐ 1	☐ 2	☐ 3	☐ 4
Language is a problem.	☐ 1	☐ 2	☐ 3	☐ 4
Policy and regulation on internet usage do not support access of the information.	☐ 1	☐ 2	☐ 3	☐ 4
Other barriers.	☐ 1	☐ 2	☐ 3	☐ 4

21**Service delivery output**. Please put tick mark on respective boxes

Scale: 1=Strongly Disagree; 2=Disagree; 3= Undecided; 4=Agree; 5=Strongly Agree.

Standard of Services					
Municipality website provides reliable online services.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Municipality website provides services at the times it promises.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Municipality website gives prompt online services to citizens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Municipality website is designed with citizens' best interest at heart.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Municipality website is designed to satisfy the needs of citizens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Types of online services offered by municipality met my needs.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online services offered by municipality are accurate.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online services offered by municipality up-to-date.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Choice and Consultation					
Citizens are involved in the budgeting process by municipality.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Citizens are given the opportunity to have payment plan options for their bills.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to online services					
Municipality is promoting access and use of online services.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online services are better than manual services?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
How is the feedback like when you make an enquiry online?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Value for money					
Online services offered by municipality are priced correctly.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Online services offered by municipality exceed my expectations.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

22**Impact of e-governance** [Please put tick mark on respective boxes]

[Scale: 1=Very Dissatisfied; 2= Dissatisfied; 3= As Usual; 4=Satisfied; 5=Very Satisfied].

Efficiency of Services					
Offering of online services by municipalities improve the speed on delivering services.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Efficiency of services encourages citizens to pay their bills.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Queuing for services is the thing of the past.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Convenience					
Electronic governance (e-governance) promotes services to be offered 24/7.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Distance and time is not an issue with e-governance.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Level of interaction					
e-governance promote interaction between citizens and municipality.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e-governance promotes interaction between municipality and its stakeholders.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Corruption					
Middleman interference is removed on tender process.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Adjudication of tender is done electronically - no interference of human beings.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Cash transactions are eliminated.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

23**e-governance outcomes** [Please put tick mark on respective boxes]

[Scale: 1= Strongly Disagree; 2= Disagree; 3= Neither Agree or Disagree; 4=Agree; 5=Strongly Agree

Accountability					
Implementation of e-governance by municipalities can make them answerable of their action and decision towards citizens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Implementation of e-governance by municipalities makes them answerable in their actions and decisions to the stakeholders.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I am able to communicate with government officials through the government website/email/ internet.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Transparency					
e-governance promotes easy access of information by citizens/stakeholders from municipality.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e-governance makes municipalities apparent in their actions and decisions towards citizens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
The government websites enable me to actively give my opinion to the government.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Effectiveness					
e-governance streamlines the interaction process between different government organizations.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
e-governance speed up the process of delivering services to the citizens.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Thank you for your time

ANNEXURE B: INTERVIEW PROTOCOL FOR E-GOVRNANCE BY MANAGEMENT OF MUNICIPALITY

Title and Name_____

Position_____

Municipality_____

Department_____

Phone/Email_____

Date of Interview_____

1 Uptake and usage of Information Communication Technology by citizens

1.1 Does your municipality have website?
1.2 How often is it updated?
1.3 How many users are registered with your municipality?
1.4 What motivate these users to register with your municipality?
1.5 What information can be found on your website that could be of interest to the citizens?
1.6 How is the municipality promoting the uptake and usage of ICT by citizens as part e-governance in improving service delivery?
1.7 What e-governance interventions are in place to assist the speeding of online Service delivery by municipality?
1.8 From your experience what challenges are there that hinders citizens not to use online services available on the municipality website?
1.9 What do you think should be done to solve the challenges you have mentioned above?
1.10 Citizens are reluctant to do their transactions online, what security measures do you have in place that prevents fraud or identity theft?
1.11 What do you think should be done to encourage citizens to use and accept Information Communication Technology as part of e-governance initiative by municipality?

2 Strategies and Services offered by Municipality

2.1 What kind of services do you offer to your citizens?

2.2 From the above services offered which ones are offered online?

2.3 What are the major advantages of using ICT as part of e-governance in improving service delivery in your municipality?

2.4 What are the major disadvantages of using ICT as part of e-governance in improving service delivery in your municipality?

2.5 Is your staff supportive of e-governance initiatives by municipality?

2.6 If yes, what motivates the staff to support the initiative?

2.7 If no, what are the major challenges of not supporting the initiative?

2.8 How can Municipality improve its relationship with its citizens through the use of e-governance?

2.9 In your opinion what strategies should be put in place to improve online service delivery for the municipality?

Thank you for your time

ANNEXURE C: ETHICS CLEARANCE

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
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Institutional Research Ethics Regulatory Committee
Tel: +27 18 299 4849
Email : Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the **Human Resource Research Ethics Committee (HRREC) on 05/06/2017**, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby **approves** your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: Framework for e-governance to improve service delivery for authorities' in South Africa

Project Leader/Supervisor: **Prof JA Meyer**
Student: **G Muridzi**

Ethics number: N W U - 0 0 5 0 5 - 1 7 - A 9
(Institution – Project Number – Year – Status)

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Doctoral

Commencement date: 2017-04-30 **Expiry date**: 2020-04-30 **Risk:** NA

Special conditions of the approval (if applicable):

- Translation of the informed consent document to the languages applicable to the study participants should be submitted to the HRREC (if applicable).
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the HRREC. Ethics approval is required BEFORE approval can be obtained from these authorities.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- *The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC via HRREC:*
  - *annually (or as otherwise requested) on the progress of the project, and upon completion of the project*
  - *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.*
  - *Annually a number of projects may be randomly selected for an external audit.*
- *The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the HRREC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC via HRREC and new approval received before or on the expiry date.*
- *In the interest of ethical responsibility the NWU-IRERC and HRREC retains the right to:*
  - *request access to any information or data at any time during the course or after completion of the project;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the project are revealed or suspected,*
    - *it becomes apparent that any relevant information was withheld from the HRREC or that information has been false or misrepresented,*
    - *the required annual report and reporting of adverse events was not done timely and accurately,*
    - *new institutional rules, national legislation or international conventions deem it necessary.*
- *HRREC can be contacted for further information via Estie.Emtoch@nwu.ac.za or 018 289 2873.*

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC or HRREC for any further enquiries or requests for assistance.

Yours sincerely

Prof LA Du Plessis
Digitally signed by Prof LA Du Plessis
Date: 2017.06.08 15:16:49 +02'00'

Prof Linda du Plessis
Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

ANNEXURE D: LETTER TO CONDUCT RESEARCH

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

NWU School of Business and Governance (GSB&GL)
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Email: Gradschool@nwu.ac.za

01 November 2016

TO WHOM IT MAY CONCERN

Permission to conduct research –Mr G Muridzi-(28296524) PhD Student

This letter serves to introduce Mr G Muridzi who is presently a registered student for Doctor of Philosophy (PhD) programme at the NWU School of Business and Governance of the North West University. He is conducting a research project on "**Electronic governance to improve service delivery by local authorities in South Africa**" towards a partial fulfillment of his PhD programme

In this regard, your office is requested to afford him full co-operation to conduct this research. In particular, Mr G Muridzi requires permission to access information, data or even to distribute questionnaires.

Your cooperation will be highly appreciated.

01 NOV 2016

.....

Dr Joseph Lekunze
Research Manager
NWU School of Business and Governance

ANNEXURE E: LABEL MEANING FOR QUANTITITATIVE

Respondents	Label	Respondents	Label
Gender	0	Political_issues	19_d
Age	3	State_address	19_e
Education	4	Personal_interest	19_f
Occupation	5	Others	19_g
Income	6	Poor_infrustructure	20_a
Municipality	7	Information_difficult_to_find	20_b
Access_Internet	8	No_search_skills	20_c
Frequency	9	Information_complicated	20_d
Get_access_Internet	10	Internet_usage_expensive	20_e
Gadget	11	Information_located_far	20_f
Network_to_Connect	12	Luanguge_problem	20-g
Motivation	13	Policy_not_support_access	20_h
Security	14_1	Other_barriers	20_i
Access_to_Services	15	Provides_reliable_services	21_a
Easy_Use	16_a	Provide_services_timeously	21_b
Easy_Learn	16_b	Gives_prompt_online_services	21_c
Find_easy	16_c	Website_citizens_interests	21_d
No_effort	16_d	Website_satisfy_citizens_needs	21_e
Not_Frustrating	16_e	Online_services_meets_customers_needs	21_f
Accurate_information	16-f	Online_services_are_accurate	21_g
Reliable_information	16_g	Online_service_up_to_date	21_h
Relevent_information	16_h	Citizens_participate_in_budget_process	21_i
Easy_to_understand	16_i	Payments_plan_options_for_bills	21_j
Useful_format	16_j	Municipality_promote_use_of_online_services	21_l
Meet_my_needs	16_k	Online_services_better_than_manual	21_m
Drivers_Licence	17_a	Feedback_on_online_enquiry	21_n
Business_Licence	17_b	Online_services_priced_correctly	21_o
Bills_Statement	17_c	Online_services_exceeds_expectation	21_p
Payment_Rates_and_Taxes	17_d	Online_services_improves_service_delivery	22_a
Information_on_policy	17_e	Efficiency_encourages_citizens_to_pay_bills	22_b
Land_information	17_f	Queues_is_no_more	22_c
Change_of_ownership	17_g	E_governance_promotes_24_7	22_d
Payment_of_fines	17_h	Distance_and_time_not_issue_with_e_governance	22_e
Payment_water_electricity	17_i	E_governance_promote_interaction_citizens	22_f
Refuse_and_waste	17_j	E_governance_promote_interaction_stakeholders	22_g
Parks_Cemeteries	17_k	Middleman_is_removed_on_tender_process	22_h
Emergency_services	17_l	Adjudication_of_tender_done_electronically	22_i
Renewing_Licences	18_a	Cash_transactions_eliminated	22_j
Voter_registration	18_b	Answerable_to_citizens_of_their_action_decisions	23_a
National_parks	18_c	Aswerable_to_stakeholders_of_their_actions_decisions	23_b
Voting_on_internet	18_d	Able_to_communicate_through_website_email_internet	23_c
Information_on_VAT	18_e	Promote_easy_access_of_information_by_citizens_stakeholders	23_d
Online_payments	18_f	Municipality_apparent_in_their_action	23_e
Online_forms	18_g	Website_ecourages_to_give_opinion	23_f
Licences_Marriage_etc	18_h	E_governance_streamlines_interactions_process	23_g
Medical_information	18_i	E_governance_speedup_service_delivery	23_h

Sponsorship_information	18_j
Contracts	18_k
Research_information	19_a
Update_knowledge	19_b
Need_for_service	19_c

ANNEXURE F: CODE FAMILIES FOR QUALITATIVE

Code Families

HU: E-governance Test
File: [C:\Users\TAFADZWA\Desktop\Data analysis Trial version\E-governance Test.hpr7]
Edited by: Super
Date/Time: 2017-11-06 11:44:40

Code Family: Advantage ICT as part of e-governance
Created: 2017-10-20 21:53:37 (Super)
Codes (12): [24/7 services] [Accuracy] [Cloud storage] [Convenience] [Cost reduction] [Effectiveness] [Efficiency of services] [Enhanced security] [Faster] [Improve service delivery] [Reduction of errors] [Speed operations]
Quotation(s): 14

Code Family: Citizen relationship
Created: 2017-10-20 21:56:37 (Super)
Codes (6): [Accurate information] [Communication] [Demonstration] [Feedback] [Partnership] [Reliable e-services]
Quotation(s): 19

Code Family: Disadvantages of ICT
Created: 2017-11-06 10:14:51 (Super)
Codes (12): [Citizens resistance] [Computer illiterate] [ICT driven shop] [Infrastructure] [Initial capital outlay] [Lack of adoption] [Load shedding] [Resistance] [Security issues] [Slow response] [Staff resistance] [Unavailable network]
Quotation(s): 22

Code Family: Hindrance to use of online services
Created: 2017-10-20 21:42:31 (Super)
Codes (12): [Access speed] [Availability of WIFI] [Computer illiterate] [Device compatibility] [Human challenges] [Internet access] [Internet connectivity] [Lack of smart phones] [Obsolete equipment and Applications] [Service Providers] [Unavailability of facilities] [Unfriendly website]
Quotation(s): 15

Code Family: Intervention in speeding online services
Created: 2017-10-20 21:40:32 (Super)
Codes (13): [Application for indigent] [Applications] [Availability of WIFI] [Call Centre services] [Citizens Focus Service Plan] [e-health solution] [e-statement] [Financial system] [Mobile applications] [Payment channel] [Policy on e-governance] [Public Participation] [Social media platforms]
Quotation(s): 21

Code Family: Presence of website and usefulness
Created: 2017-10-20 16:09:35 (Super)
Codes (27): [Accessing account information] [Communication] [Compliance documents] [e-procurement] [e-service website] [e-statement] [Enquires] [Financial and transactions] [Financial statements] [Information] [Log incidences] [Management] [Maps] [Meetings] [Municipality activities] [News] [Office bearers] [Policies] [Properties] [Representation] [Requirements by law] [Static website] [Unavailability of accounts] [Update] [Users] [Vacancies] [Website]
Quotation(s): 60

Code Family: Security measures
Created: 2017-10-20 21:46:45 (Super)
Codes (9): [Authentication] [Encryption] [End point security] [Industry Security Standards] [Password] [Registration] [SSL] [Trust]

[Verify registration]
Quotation(s): 11

Code Family: Services offered by Municipality
Created: 2017-10-20 21:49:04 (Super)
Codes (16): [Call Centre services] [Citizen involvement] [Communication] [CRM] [e-health solution] [e-mails] [e-procurement] [Financial and transactions] [Financial Services] [Goggle jar] [Infrastructure services] [Online services available] [Properties] [Smart Cities] [Social and Community services] [Walk-in Centres]
Quotation(s): 49

Code Family: Solutions to hindrance of online services
Created: 2017-10-20 21:44:16 (Super)
Codes (15): [Affordable smart phones] [Broadband] [Education and Support] [Efficiency of services] [Fast line] [Free WIFI] [Friendly Website] [GBN] [Invest in ICT] [Modernisation of ICT] [Network infrastructure] [Public Private Partnership] [Renovation of website and applications] [Security issues] [Social programme]
Quotation(s): 21

Code Family: Staff buy-in and support
Created: 2017-10-20 22:00:30 (Super)
Codes (15): [Benefits of using online services] [Change management] [Generation gap] [Human nature] [Level of technology adoption] [Life easier] [Paperless environment] [Resistance] [Saves time] [Staff buy-in in e-governance] [Staff illiterate] [Staff resistance] [Staff support] [Threat of job loss] [Understand benefits]
Quotation(s): 30

Code Family: Strategies to improve online service delivery
Created: 2017-10-20 22:05:11 (Super)
Codes (20): [24/7 Web service] [Accessing online services] [Budget availability] [Cloud applications] [Communication infrastructure] [Communication layer] [Corporate governance ICT framework] [Digital ICT Framework] [Full ecosystem] [Integration layer] [Modern Desktop] [Political buy-in] [Public internet] [Relationship] [Remove corruption] [Right Software] [Security issues] [Shared applications] [Skilled professionals] [Staff training]
Quotation(s): 25

Code Family: Uptake and usage of ICT
Created: 2017-10-20 21:34:45 (Super)
Codes (20): [24/7 facility] [Account history] [Advertising] [Awareness of advantages] [Build trust in system] [Communication] [Core mandate] [Customer awareness] [E-channels] [e-mails] [e-statement] [Enquires] [Financial and transactions] [ICT driven shop] [Increase community literacy level] [Natural acceptance of ICT] [Paperless environment] [Public Participation] [SMS] [Take advantage of social media platforms]
Quotation(s): 46