A COMPARATIVE STUDY ON THE UTILISATION OF E-GOVERNMENT BY SELECTED MUNICIPALITIES IN SOUTH AFRICA AND RWANDA: DEVELOPMENT OF A MODEL FOR EFFECTIVE AND EFFICIENT ONLINE SERVICE DELIVERY

by

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DECLARATION

I, Phanuel Murenzi, student number [redacted] do hereby declare that this research report submitted to the Central University of Technology, Free State for the degree D.Tech: Public Management is my original work and has not previously been submitted by me at another university or at any other institution of higher learning. Wherever contributions of others are involved, every effort has been made to indicate this clearly, with due reference to the literature. I further cede the copyright of the thesis in favour of the Central University of Technology, Free State.

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1 August 2016

BLOEMFONTEIN, SOUTH AFRICA

DEDICATION

I dedicate this study to the memory of my late father, Phenias Sebuhunyeli, who encouraged me to stay focused in life and instilled discipline and the fear of God in me.

To my mother, Zibie Uwimbabazi, who supported and encouraged me during the tough days in school.

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ABSTRACT

In today's information age and knowledge society, many countries in the world, including South Africa and Rwanda, have now adopted the use of new Information Communication Technologies (ICTs), especially the internet, in their public sector as one of the main delivery channels for public services. Online service delivery is increasingly seen as a means to reduce costs while providing better services to citizens. Local government, being the centre and cornerstone of service delivery and the channel used by government to improve people's lives, has to be at the forefront of utilising modern ICTs in order to effectively and efficiently address the changing and increasing needs and expectations of citizens.

The utilisation of e-government by local spheres of government in developed countries such as France, South Korea and England has played an important role not only in streamlining public administration but also in enhancing the quality of service delivery to citizens. The end results were, amongst others, improved transparency and accountability, less corruption, and less citizens' dissatisfaction with government services. However, the local spheres of government in both South Africa and Rwanda are still struggling to deliver effective services to citizens. Citizens express their dissatisfaction with service delivery through strikes and community protests as frequently reported in the media. The researcher assumes that if e-government had effectively been used by the district municipalities in particular, it could have assisted the district municipalities in complying with the Batho Pele Principles, and therefore in delivering better services to the citizens.

The aim of the study was to determine and compare the level of utilisation of e-government by the four selected district municipalities both in South Africa and Rwanda. In addition, from the research findings a model for the effective utilisation of e-government by the selected district municipalities was to be developed. The main objective and the nine co-objectives of the study were achieved through the data collected by means of the three main data collection techniques, namely documentary, survey and structured interviews. As two parties (supply side and demand side) must be involved for the utilisation of e-government to be successful, two types of respondents were targeted. The simple random sampling method was

used to select 400 respondents who were ordinary citizens living in the areas known as townships, while the judgemental sampling method was used to select 40 interviewees who were officials from district municipalities.

The research findings showed that a limited amount of online information and services are provided and the district municipalities are struggling to make progress in moving to the more advanced stages of e-government development, including the provision of more online services, online payment and online participation. In addition, the level of awareness and the level of utilisation of available online services by the citizens were very low. The main constraints were related to lack or low level of education and low level of income. To address the situation, efforts to promote both provision of online services (supply side) and usage of online services (demand side) must go hand- in- hand. Government efforts to develop e-government services need to go closely together with its efforts to increase demand and usage by the citizens.

LIST OF ABBREVIATIONS AND ACRONYMS

4 GLTE-.Fourth Generation Long-Term Evolution

AGSA- Auditor-General South Africa

AISI- African Information Society Initiative

ATMs- Automated Teller Machines

BCDs- Business Development Centres

DoI- Diffusion of Innovation

DPSA- Department of Public Service and Administration

DTWMS- Document Tracking and Workflow Management System

EGDI- E-Government Development Index

G2B- Government to Business

G2C- Government to Citizens

G2G- Government to Government

G2X- Government to Other Organisations

GDP- Gross Domestic Product

GITOC- Government IT Officer's Council

GoR- Government of Rwanda

HCI- Human Capital Index

ICT- Information Communication Technology

ID- Identity Card

IDP- Integrated Development Plan

IIS- Inclusive Information Society

IMF- International Monetary Fund

INFODEV- Information for Development Programme

ISPs- Internet Service Providers

IT- Information Technology

ITU- International Telecommunication Union

LUMIS- Land Use Management and Information System

MIOS- Minimum Interoperability Standards

MISS- Minimum Information Security Standards

MPCCs- Multi-Purpose Community Centres

MPCU- Model of PC Utilisation

NGOs- Non-Governmental Organisations

NICI- National Information and Communication Infrastructure

NPM- New Public Management

RDB- Rwanda Development Board

RDB-IT- Rwanda Development Board- Information Technology

RITA-Rwanda Information Technology Agency

RSA- Republic of South Africa

RURA- Rwanda Utilities Regulatory Authority

SABC- South African Broadcasting Corporation

SITA- State Information Technology Agency

SMEs- Small and Medium Enterprises

SPSS- Statistical Package for Social Science

SSA- Sub-Saharan Africa

Stats SA- Statistics South Africa

TAM- Technology Acceptance Model

TAM2- Extension of the Technology Acceptance Model

TII- Telecommunication Infrastructure Index

TPB- Theory of Planned Behaviour

TRA- Theory of Reasoned Action

UN- United Nations

UNDP- United Nations Development Programme

UNECA- United Nations Economic Commission for Africa

USA- United States of America

USALs- Under- Serviced Area Licences

UTAUT-United Theory of Acceptance and Use of Technology

WMI- Web Measure Index

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CHAPTER 1: GENERAL BACKGROUND TO THE STUDY

1.1. INTRODUCTION

The majority of South Africans and Rwandans showed great enthusiasm and had great expectations of their respective new governments which came to power in 1994. People of both countries were expecting better health and education facilities, a better infrastructure, and the provision of better housing, accessibility to purified piped water, electricity and sanitation.

To meet the different and increasing needs and expectations of the people, the new government in Rwanda initiated two major administrative reforms as the starting point, namely a policy of decentralisation and modernisation of the public service (Ministry of Local Government and Social Affairs, 2006). The starting point for the new government in the Republic of South Africa was the radical transformation of the public service which included all three spheres of government. For that reason, the White Paper on the Transformation of the Public Service was published on 15 November 1995. The transformation at municipal level was facilitated by the Demarcation Act (Act 27 of 1998) that reduced the 843 local authorities to the current 226 municipalities, eight metropolitan municipalities and 44 district municipalities (http://www.demarcation.org.za).

The common objective for both governments was the transformation and modernisation of the public service and local governments so that they could become an administrative vehicle by means of which government delivers services to the citizens. From 1994 up to now, each of the two governments spent considerable amounts of money to enhance Information Communication Technology (ICT) capabilities in the public sector, because the envisaged transformation and modernisation could not be realised without investing in new information and communication technologies. E-government, defined as the use of information technology by government institutions for delivering government information and services to the citizens (Yayehyirad 2006:4), was the principal envisaged focus. However, there is a dire need to investigate how much effort the government has put

into this transformation and modernisation and how citizens have benefited and are benefiting from e-government initiatives, specifically in local spheres of government.

Though the socio-cultural, statutory, technological and economic environments in which local governments of both countries operate and deliver public services are different, local governments of both countries encounter basically similar types of problems with regard to service delivery. The problems of bureaucracy; paper-based work; lack or shortage of management skills; poor transparency and accountability; poor audit reporting; poor record keeping; embezzlement; misuse of public money; corruption; nepotism; poor consultation and communication with citizens; poor monitoring and evaluation were and are observed in local governments of South Africa and Rwanda.

The issues of poor service delivery and misuse of public money are serious and common to the majority of local governments in Rwanda and South Africa. For instance, South Africa experienced 9,83 community protests per month in 2007 about poor service delivery in local governments; 17,75 community protests per month in 2009 and 11,08 community protests per month in 2011 for the same reasons (Karamoko & Jain 2011:2). In Rwanda, the freedom to protest or strike is limited and for that reason cases of community protests about poor service delivery in local governments are not very frequent. However, this does not mean that citizens are satisfied with the service delivery by municipalities.

According to the Auditor-General of South Africa (AGSA), the audit results of local government of poor and wasteful expenditure are a big challenge (Setumo 2013). The AGSA report on municipal finances (AGSA report, 2012) shows that only 17 out of 278 district and local municipalities received clean audits for the 2011-2012 financial year. Clean audits represent just 5 percent of all metropolitan municipalities and district municipalities that were audited. Another 13 percent of municipalities failed to submit their financial statements and all eight metros failed to obtain a clean audit. The same report shows how public money is misused by municipalities where irregular expenditure, especially in supply-chain management, amounted to R9.82 billion, while fruitless and wasteful expenditure reached a disturbing R568million (Setumo 2013).

In Rwanda, the Auditor-General's report for the 2011-2012 financial year shows that 6 out of 30 districts had clean audits and only 5 districts were able to perfectly keep their records, especially those related to public money expenditure. The total of irregular expenditure amounted to RWF 6 billion (R900 million), while fruitless and wasteful expenditure reached RWF4.9bn (R753m) (Tabaro 2012).

The causes of irregular and wasteful expenditure and poor service delivery in the local spheres of government are numerous and complex. From a simplistic analysis, some people conclude that the only cause of these failures is the lack or shortage of skills in local government. However, whilst the shortage of skills does occupy a central position in the delivery of public services, skills shortage alone cannot be blamed for public service delivery inertia. The problem is, however, that local governments do not only suffer from a shortage of skills, but they may also suffer from the lack or poor utilisation of new ICT.

Twenty years ago local government in developed countries experienced the same challenges faced by local governments in Rwanda and South Africa today. However, the effective utilisation of ICT helped them to remedy many problems related to poor service delivery. According to Evans and Yen (2006:212), the digitalisation of government functions helped local government in the United Kingdom to increase customer service levels and decrease costs. It improved the collection and keeping of information that will assist decision-makers in serving citizens more effectively. The role of e-government in transformation of local government in developed countries was shown also by Palvia and Sharma (2006:1) when they argue that the utilisation of ICT in France, for example, served a variety of different ends: better delivery of government information and services to citizens; improved interactions between government and citizens and businesses; citizen empowerment through easy access to information; and more efficient government management. The resulting benefits were less corruption, increased transparency, greater convenience and revenue growth through cost reductions.

According to the White Paper on Transforming Public Service Delivery, 1997 (Batho Pele White Paper), the South African Public Service or local government will be judged by one criterion, which is: its effectiveness in delivering public services that meet the needs of all people. Therefore, the failure of local municipalities to provide

good public services to the citizens implies that they have failed to implement the Batho Pele principles. However, the effective utilisation of ICT by the local sphere of government would help to implement Batho Pele Principles such as:

- **Consultation**

One of the reasons cited by protesters is a lack of or poor consultation (Karamoko & Jain 2011:3). However, the utilisation of ICT can improve the ability of local government and citizens to communicate information to each other in an efficient and electronic manner (Heeks 2002:6). The use of ICT can facilitate communication, cooperation and consultation between local governments and citizens, businesses, central government and other stakeholders.

- **Access**

This principle is addressed in the Batho Pele White Paper and in the Constitution of the Republic of South Africa (Constitution, 1996). It states that all citizens shall have equal access to services and the services must be provided impartially, fairly, equitable and without bias (section 195(1)(d) of the Constitution, 1996). Equal access is also a concern for the community which protests about not having the same chances of access to government information and services, as they are entitled to in terms of the Constitution, 1996 and the Batho Pele Principles (Sipho 2012:4).

The use of ICT can facilitate gaining access to government information and services that were previously only available to those who were able to go to the service provider and able to wait in long lines. With e-government, government services and information can be accessed by citizens on a twenty-four-hour basis, seven days a week and at all accessible locations. The use of ICT in the public sector promotes access to government information and services by all citizens without any kind of discrimination.

- **Service standards**

The use of e-government can enable local municipalities to achieve efficiency because it helps to raise the internal production efficiency of public agencies and/or local governments, thus saving taxpayer's money. According to Moon and Norris (2005:51), the use of e-government can serve to achieve efficiency in two ways: The first is to raise labour productivity and cut employment by means of the automation of

administrative procedures and the simplification of processes. The second is to lower the costs of public procurement by means of better information on prices, promotion of market competition and more transparent and market-friendly purchasing procedures. The use of ICT in the procurement process (e-procurement) assists in lowering the costs of public purchases of goods and services. Furthermore, the use of ICT reduces the time required to deliver a public service. With e-government for example, a personal ID can be issued within one hour, whereas it took 30 days before.

- **Openness and transparency**

Being open and transparent implies that local government must let citizens or customers know how they are achieving the promised standards of service delivery and how non-delivery is addressed (Nengweklulu 2009:346). The intensification of information and communication flows that characterise e-government strengthens transparency and openness of political and administrative processes in local government. The more interactions and information flow between local governments and citizens, businesses and civil society, the more openness and transparency are consolidated. Citizens and civil society will be better equipped to articulate their interests and hold local government officials accountable.

- **Value for money**

This principle implies that available resources should be put to good use. Digitising procurement can help to remedy the problem of irregular and wasteful expenditure in the supply-chain management process in local government. E-government can also simplify the process of tax collection. According to Heeks (2002:4), the use of ICT by government institutions can help to diminish the level of corruption and bureaucracy. However, numerous challenges limit local governments in Africa to seize the opportunities offered by ICT applications. In this regard, Yayehyirad (2006:13) identified the following key challenges:

- **Socio-cultural issues**: low adult literacy rates, low knowledge of languages that dominate computing and resistance to change;
- **Economic issues**: corruption, poor budget, dependence on donor funding and lack or poor infrastructures such as electricity;

- **Technological issues**: limited local skills including computer literacy, poor technical design, high cost of the internet and connectivity problems, lack of telecommunication infrastructures; and
- **Institutional and organisational issues**: lack of e-government enabling institutions and poor monitoring and coordination of e-government programmes.

The effective utilisation of e-government by municipalities in both South Africa and Rwanda can contribute to remedy quite a number of problems. However, this important tool has been under-considered and poorly used by local government. Few available researches focused on the utilisation of ICT by central government agencies, but not at local government level. The study aims to investigate and compare the level of utilisation of e-government by the selected local municipalities in South Africa and Rwanda. The case study is based on the two district municipalities of Fezile Dabi and Lejweleputswa in South Africa and the two district municipalities of Kicukiro and Kamonyi in Rwanda.

In addition, this research is limited to e-government rather than e-governance. According to Heeks (2002:23), e-governance is a broader concept that deals with the whole spectrum of the relationship and networks within government regarding the usage and application of ICTs, whereas e-government is actually a narrower discipline dealing with the development of online service delivery to citizens. E-government constitutes a subset (but a major one) of e-governance. Therefore, this study is directed more at e-government, because it aims to investigate how selected district municipalities are utilising ICT to enhance service delivery to citizens.

1.2 PROBLEM STATEMENT

In the reports of the Auditor-General of South Africa and the Auditor-General of Rwanda on local finances and local service delivery in Setumo (2013); Tabaro (2012) and in Karamoko and Jain (2011), there is evidence that citizens and the central government authority are not satisfied with the ways in which the local spheres of government in South Africa and Rwanda are delivering public services to citizens and the manner in which public money is used for community benefits. The total failure or partial failure to provide quality public services by municipalities in South Africa and Rwanda is often and principally associated with a lack or shortage

of skills in municipalities. However, the lack or poor utilisation of e-government in the majority of municipalities might be another major cause of poor service delivery and the reason for failing to get the best possible value-for-money.

Therefore, by undertaking this study the researcher assumes that the ICT infrastructure is lacking and that e-government is under-utilised by district municipalities in Rwanda and South Africa, which has a detrimental effect on the provision of service delivery and the effective use of public money.

1.3 RESEARCH QUESTION

The following main research question and six sub-questions guide this research:

1.3.1 Main research question

The main research question for this study is:

How effectively is e-government currently being utilised by the district municipalities of Fezile Dabi and Lejweleputswa in South Africa and Kicukiro and Kamonyi in Rwanda?

1.3.2 Sub-questions

The sub-questions that act as a guideline and which need to be answered in this study are:

- What is the expected role of e-government as far as service delivery is concerned in South Africa and in Rwanda?
- Is there a difference in the level of awareness of the customers (citizens) of e-government in each of the four selected district municipalities on the purpose and benefits of e-government?
- What online services are currently offered to the customers by each of the four selected district municipalities?
- How effective are online services provided by each of the four selected district municipalities utilised by the customers?
- What are the factors influencing the utilisation of e-government services by the customers?
- What are the main constraints in the provision of e-government at the local spheres of government in South Africa and Rwanda?
- Do selected district municipalities have the same constraints?

- How can e-government be improved in order to enhance service delivery at the local sphere of government?

1.4 OBJECTIVES OF THE STUDY

The main objective of the study is to conduct a comparative study on the utilisation of e-government by the two district municipalities of Fezile Dabi and Lejweleputswa in South Africa and the two district municipalities of Kicukiro and Kamonyi in Rwanda. The outcome of the study will assist with developing a model for effective and efficient online service delivery at the local sphere of government.

To achieve the main objective, the following specific sub-objectives are to:

- Determine through extensive literature searches (journal articles and legislative frameworks) the purpose and role of the local spheres of government in Rwanda and South Africa and the role of e-government as an effective enabling tool to streamline public administration activities and better service delivery to citizens;
- Determine the level of awareness of the district municipality officials about the purpose, opportunities and requirements of e-government;
- Determine the level of awareness of the customers (citizens) of e-government services in South Africa and Rwanda;
- Determine the type of online services offered by each of the selected district municipalities in Rwanda and South Africa ;
- Determine the level of request and utilisation of online services by the customers of each of the selected district municipalities in Rwanda and South Africa ;
- Determine the factors influencing the utilisation of online government information and services by the customers;
- Determine the contribution of e-government to improving public service delivery in the selected district municipalities in Rwanda and South Africa;
- Determine the constraints in the use of e-government at the local spheres of government in Rwanda and South Africa; and
- Develop a model for effective and efficient online service delivery at the local sphere of government.

1.5 RESEARCH DESIGN

In the course of generating scientific knowledge, social researchers are requested to utilise methods and procedures which are based on facts that would enhance the probability of attaining validity (Mello 2007:83). For that reason, the social researcher has to decide which research approaches, methods and techniques are to be used to reach the goal of valid knowledge. Scientific or valid knowledge is defined as the outcome of rigorous, methodical, and systematic inquiry, as opposed to the haphazard way in which ordinary knowledge is acquired (Kothari 2004: 16).

As far as research methodology is concerned, the researcher had to determine:

(i) The philosophical paradigm, which can be positivism, post-positivism, empiricism, social constructivism or interpretivism, that guides the thinking, interpretation, understanding of social phenomena and how to explore the social world. In this regard, this study follows the post-positivism interpretive paradigm.

(ii) The research approach, which can be a qualitative, quantitative or mixed methods approach. The precision in the research approach determines the types of data to be collected (qualitative or quantitative), how to collect them and how to analyse them. A mixed methods approach was critical to collect both qualitative and quantitative data necessary to answer the research questions for this research. Three main data collection methods (triangulation), namely documentary research, face-to-face in-depth interviews and surveys were utilised by the researcher to investigate the utilisation of e-government by the selected district municipalities. The combination of qualitative data and quantitative data helped to thoroughly investigate and fully understand the topic of research. The mixed methods approach further increased the reliability and validity of research findings, because the data from semi-structured interviews and information from documentary research were corroborated by the data from survey.

(iii) The research design, which can be a case study, ethnography, phenomenology or action research. The precision about the type of research design helps to narrow and define the boundaries of research enquiry and it allows in-depth exploration and understanding of a particular

research enquiry. This study is a comparative case study. It aims to investigate and compare the utilisation of e-government by the selected district municipalities of Lejweleputswa and Fezile Dabi in South Africa and the Kicukiro and Kamonyi district municipalities in Rwanda.

(iv) The target population, which can be households, group of individuals, organisations or units. For this study, the target population was individuals from the black community who live in the townships and who are 18 years of age and above.

(v) The sampling methods, which can be probability sampling or non-probability sampling. For the purpose of this study, two methods were used: a non-probability that is purposive sampling and a probability that is random sampling. Purposive or judgemental sampling was used to select 40 interviewees from members of staff of district municipalities who were knowledgeable and involved in online service delivery. Random sampling was used to select 400 respondents who participated in the survey.

(vi) The techniques for data collection, which can be surveys, interviews, documentary research, observation or a combination of methods (triangulation). The methods used to collect data depend largely on the type of data to be collected. For the purpose of this study, a combination of techniques (triangulation) was used. Documentary research was used to collect secondary data or information, while survey and semi-structured face-to-face interviews were used to collect primary data or empirical data.

(vii) The methods for data analysis can be statistical analysis or thematic analysis. For the purpose of the study, data from the survey were statistically analysed using the Statistical Package for Social Science Research (SPSS). Details of the research methodology are discussed in Chapter 5.

1.6 ETHICAL CONSIDERATIONS

According to Brynard (in Mello 2007:7), confidentiality and honesty are the most important ethical requirements for a researcher. In addition, Myers (2009:69) states that consent, deception, and privacy are the ethical problems which necessitate careful consideration by authors in the social sciences.

As mentioned earlier, primary sources of data were used extensively in this research. Therefore, survey and interviews were the major data collection methods. Before the interviews were conducted and the questionnaires distributed to the respondents, the official authorisation to conduct the research was requested and obtained from the mayor of each district municipality.

To ensure that the ethical requirement of voluntary participation is respected, the interviewees and respondents were informed about the purpose of the study and then asked to voluntarily participate in the research. In cases where interviewees wanted to verify the accuracy of the author in quoting their information and comments in the thesis, sections of the thesis containing their quotations were forwarded to them for deliberation and further comments.

To ensure accurate reporting, the researcher minimised the possibility of findings and conclusions being false or misleading. The researcher did not deliberately fabricate data or falsify results; omit cases or manipulate numbers in order to show significance; plagiarise passages from articles or books without recognising the original author(s); misrepresent authorship by using a ghost writer or naming a co-author who was not directly involved with the study.

Last but not least, the three most important ethical requirements, namely confidentiality, honesty, and the anonymity of participants were adhered to in this research.

1.7 SIGNIFICANCE OF THE STUDY

Taking into consideration the increasing strikes and community protests about poor service delivery and the unclean audits (reference to reports from the Auditors-General of South Africa and Rwanda, 2012), it is a fact that local spheres of government both in Rwanda and South Africa failed and are failing to provide better service delivery to citizens. The weakness in the provision of public services was attributed to the lack or insufficient technical skills of local government officials. However, in this era of information society and knowledge economy, the lack or poor utilisation of ICT can be one of the main causes of failure of local government to perform better and provide better services to citizens. Previously, the few researches done in the domain of e-government in both countries focused on the utilisation of e-

government by central government agencies or private institutions, but empirical research was not conducted to investigate the utilisation of e-government by district municipalities, especially in Rwanda. This study will fill the gap and therefore, weak areas and the challenges in e-government utilisation will be identified and will help to guide and redress e-government policies and strategies.

1.8 LIMITATIONS OF THE STUDY

The research required a significant amount of money as the researcher was obliged to travel from South Africa to Rwanda and also travel in South Africa and in Rwanda for data collection.

This study was limited to two district municipalities in South Africa and two district municipalities in Rwanda where the research was conducted, and a comparative study done on the utilisation of e-government by the selected district municipalities. Additional valuable information could be obtained if the study could investigate and compare e-government utilisation by all district municipalities in the two countries, but this was not possible due to limited time and funds. The findings of this research are specific to the cases investigated and therefore, cannot be generalised or applied beyond the cases studied.

The possible insufficient knowledge of e-government among the respondents was a challenge as it may affect the interest, ability and willingness of respondents to answer the questionnaire properly. The researcher took this limitation into consideration when the sample was collected. Furthermore, clear instructions on how to answer the questions were given and the queries about the completion of survey questionnaires were answered immediately by the researcher and the field assistants during the personal delivery of questionnaires to the respondents.

Another challenge was the insufficient documentation about e-government in Rwanda. A lot of progress has been made in the domain of ICT, but few documents have been produced or published and this was seen as a great challenge. As a result of the limited online documentation, the researcher physically visited the areas (government institutions or agencies) in order to check and read the available documentation, and copies of documents were made. Furthermore, with the aim of collecting sufficient information about what has been done in the domain of ICT in

general and e-government in particular, the researcher had informal conversations with people who may have had information and who were involved directly or indirectly in the domain. Last but not least, very little research has been done on e-government in the local spheres of government in both South Africa and Rwanda. However, by downloading from the internet United Nations reports of e-government development surveys and various researches on e-government in local government conducted in developed countries of Europe and America, the researcher gained some insights to fill the gap. The experience of these countries helped the researcher to gain some understanding about e-government at the local sphere of government.

1.9 DEFINITION OF KEY TERMS

Specific words or terms are used differently depending on the context and the approach used by the author. It therefore becomes necessary to clarify key terms. The following are concepts that will be frequently used in this study: e-government, e-governance, service delivery, local government, municipality, efficiency and effectiveness. However, other terms which are limited to a specific chapter will be clarified whenever it becomes necessary.

1.9.1 E-government

E-government is defined as the use of information and communication technologies by the government to improve service delivery by promoting more efficient and effective government, facilitating more accessible government services, allowing greater public access to information, and making government more accountable to citizens (Palvia & Sharma 2006:2). The definition and contextualisation of the term e-government will be discussed in more detail in Chapter 2 of the study.

1.9.2 E-governance

The concept “governance” must first be defined in order to better understand the concept e-governance. According to Mwololo and Mitullal (2009: 228), the term "governance" refers to the process of decision-making and the process by which decisions are implemented or not implemented. Therefore, the concept e-governance means employing modern ICTs to address the issues of governance, which is fundamentally the participation of citizens and other actors in the decision-

making processes. E-governance is a broader concept and consists of the use of ICT by government and civil society to promote more participation of citizens in the governance of political institutions. In addition, Okemwa and Majanja (2009:21) define e-governance as the application of ICTs in government institutions in order to simplify internal government operations, to improve the interaction between government and citizens and enhance democratic governance as well as other aspects of governance. They further argue that e-governance is closely related to e-democracy which refers to the use of ICTs for the democratic process such as public policy-making and voting. E-democracy is based on providing an online opportunity for citizens to participate and influence decision-making (Christiansen 2010:271).

1.9.3 E-government *versus* e-governance

Confusion exists between the terms e-government and e-governance. However, these two terms can be explained differently. According to Howard and Bannister (in Palvia & Sharma 2006:2), e-government constitutes a subset (but a major one) of e-governance. E-governance is a broader concept that deals with the whole spectrum of the relationship and networks within government regarding the utilisation and application of information and communication technologies whereas e-government is limited to the development of online services. In this regard, Mwololo and Mitullal (2009:230) argue that as a wider concept e-governance defines and assesses the impacts of ICTs on the practice and administration of governments and the relationships between public servants and the wider society. They further argue that e-governance implies employing modern ICTs to address the issues of governance, which is the participation in the decision-making processes of citizens and other actors, whereas e-government as a narrower discipline deals with the development of online services to the citizens.

Furthermore, to differentiate between the two concepts, Palvia and Sharma (2006: 3) provide the following points of view: e-government's focus is on constituencies and stakeholders outside the organisation, whether it is the government or public sector at national or international levels. Any interaction of a governmental agency with outside constituencies is called e-government. Outside constituencies can be citizens, businesses or other governmental agencies themselves. The telecommunications network that facilitates e-government is extranet and internet.

On the other hand, e-governance focuses on administration and management within an organisation, whether it is public or private, large or small. E-governance is basically about the internally-focused utilisation of ICTs to manage organisational resources such as capital, human, material, machines, and to administer policies and procedures. The telecommunications network that facilitates e-governance is the intranet (Palvia & Sharma 2006: 4).

1.9.4 Effectiveness

The word effective is traced back to old French (effectif) and Latin (effectivus). Both French and Latin used the word “effective” as having the expected effect or intended effect (Oxford English Dictionary 1978). The term effectiveness is defined by Cloete (in Mello 2007:41) as the extent to which a public institution succeeds in attaining its predetermined objectives. This definition puts emphasis on “expected effect or intended effect” and “success in attaining objectives”. Thus, the term effectiveness is about the achievement of intended results.

Within the context of the study, the word effective will be used to refer to the ability of district municipalities to deliver services promised to the citizens. The use of ICT by the district municipality may help to achieve effectiveness by allowing the delivery of what was promised to citizens.

1.9.5 Efficiency

The word efficiency has a Latin origin. The Latin word “efficientum” means to execute, accomplish or produce (Oxford English Dictionary 1978). It further defines efficiency as acting or producing effectively with a minimum of waste expense or unnecessary effort or exhibiting a high ratio of output to input. According to Gildenhuys (in Mavhivha 2007:36), efficiency is defined as the sparing utilisation of resources or use of minimum input to get maximum output. Within the context of this research, efficiency refers to the careful use of resources (human, financial, material and natural) by a district municipality in the provision of services to citizens. The utilisation of ICT by a district municipality may help to achieve efficiency. The costs of delivering public information and services may be reduced and the value for public money is attained.

1.9.6 Service delivery

Service delivery is defined as an activity that satisfies the needs of the customers. It is the manner in which a customer's needs are met (Mello 2007:42). To promote and ensure better service delivery to citizens, the government of South Africa established and published the Batho Pele Principles. This was initiated as a mechanism that encourages citizens to hold public servants accountable for the level of public service delivery that they receive and to improve service delivery. Batho Pele comprises eight principles, namely consultation with citizens, setting service standards, increasing access to information, ensuring courtesy, providing information, openness and transparency, redress and value-for-money (Ntetha & Mostert 2011:10). The utilisation of ICT by a district municipality may improve service delivery, because services are quickly provided, and can be accessed at anytime and from anywhere.

1.9.7 Local government

According to Planact (2001:10), a local government is the sphere of government closest to the people, and is therefore better placed than national or provincial government to effectively and efficiently carry out various tasks dealing with services and community development. In addition, Cloete and Thornhill (in Mkhonta 2007:38) define local governments as local democratic institutions or structures, which are subordinate members of the central government, vested with prescribed and controlled government powers and sources of income to render specific local services as well as control and regulate the geographic, social and economic development of the local areas.

In terms of section 151(1) of the Constitution, 1996 local government refers to the local sphere of government that consists of municipalities which must be established for the whole territory of the Republic of South Africa.

Local government *per se* exhibits the following characteristics that are common to most countries (Mkhonta 2007:41):

- **Locality** – local government should be a local body that is constitutionally separated from central government and responsible for a range of significant

services. Local government is identified with and has jurisdiction over a defined geographical area;

- **Legal personality**- a local government system owes its existence to some form of stature. An Act defines the powers and responsibilities of local government and specifies how it shall relate to the other spheres of government;
- **Governmental power**- local government has the authority to carry out formal governmental functions, implement by-laws, levy local taxes, charge rates and engage in commercial ventures to raise income;
- **Autonomy**- local councils are political institutions, and as such expect to have some autonomous decision-making authority rather than function as local out-stations of national government; and where local institutions have such autonomy they will wish to express it by responding to nationally created expectations in what they consider to be a locally determined way. A local institution should have its own budget and accounts along with substantial authority to raise its own revenue. It should employ its own competent staff whom it can hire, fire and promote. Central government administrators should serve purely as external advisors and inspectors and have no role within the local authority;
- **Representation and participation**- in a democratic system, those whose responsibility is to make decisions and direct the affairs of a local government are either elected or appointed from the community it serves. Local citizens or residents are permitted to participate in local government's affairs probably much more than is the case with national government affairs;and
- **Accountability**- local government is involved in a triangular relationship with the central government, the provincial government and the local citizenry (Mkhonta 2007:43). Those authorities responsible for local government's affairs are accountable for their actions or inactions. In addition, in a democratic system, which advocates the principle of autonomy, it is generally believed that local government is accountable to the local citizenry rather than the national government (Mkhonta 2007:44).

1.9.8 Municipality

A municipality is a political subdivision which is constituted in terms of sections 151 and 152 of the Constitution, 1996 and has substantial control of local affairs, including the powers to impose taxes. A municipality therefore refers to a local institution headed by elected representatives and appointed officials, which functions within a demarcated geographical area to provide services to its local community.

1.10 ORGANISATION OF CHAPTERS

This research report is organised into the following seven chapters. **Chapter 1** presents the introduction and background to the study, problem statement, research questions, and objectives of the study. It briefly discusses the methodology, ethical issues and limitations of the study. Finally, it defines the key concepts for the study. **Chapter 2** deals with the review of literature on e-government. It contextualises and elaborates more on the term e-government. It defines digital divide and dimensions of digital divide. It discusses the level of e-government development in Africa, and compares Africa with other regions of the world. It discusses the challenges that countries in Africa are facing to utilise ICT and e-government in particular. At the end of the chapter, the conditions for effective utilisation of e-government by countries in Africa are discussed.

Chapter 3 presents and discusses the level of e-government development in both South Africa and Rwanda. It outlines the achievements or progress made by each country and the challenges faced. At the end of the chapter, the developmental role of local government is discussed. **Chapter 4** reviews the theories and models of an innovation adoption. It discusses the factors that influence the adoption and utilisation of an innovation. In addition, from the previous theories and models on the adoption of an innovation, the model for the research to assess the utilisation of e-government services by the citizens of the selected district municipalities was developed and discussed. **Chapter 5** presents the methodology applied in the study. It discusses the philosophical paradigm for the research, research approach, data collection methods and methods for data analysis. **Chapter 6** is dedicated to the presentation and discussion of the empirical findings. Finally, **Chapter 7** presents the conclusion and recommendations for policy-makers and for further research.

CHAPTER 2: LITERATURE REVIEW ON E-GOVERNMENT

2.1 INTRODUCTION

Information and communication technologies have provided enormous opportunities for government, citizens, international agencies, and businesses. They helped governments to rationalise and modernise processes and procedures by simplifying and minimising the time to execute administrative tasks, the timeframe to deliver services to citizens, and have simplified relations between government officials and the governed. The use of ICTs by the government has changed the process of governing. The power relations between government and the governed, which were mainly vertical, hierarchical and rigidly structured were transformed into becoming horizontal and more participatory. Therefore, communications and transactions between government and citizens that traditionally took place in physical offices are now taking place online.

Since 1990, attention has been given to e-government and many governments in the developed world embraced the opportunities offered by ICT to improve the performance of their institutions, to accelerate their socio-economic development, to transform business processes and practices, and to offer value-added services to their citizens through e-government (Thakur & Singh 2013:43). Because of the use of ICT, governments in the developed world have shifted from being public bureaucracy oriented, unresponsive and unrepresentative, to being responsible and citizen oriented. The end result was a better life that is characterised by representative and participative democracy; open and collaborative decision-making; less corruption; close interactions and relationships between government, business and citizens; and enhanced service (Ngulube 2007:5).

While other regions of the world have recognised and taken advantage of ICTs for more than 20 years, the African continent in general and sub-Saharan Africa (SSA) in particular, were and are still lagging behind. Many governments in Africa failed to take advantage of the opportunities of the ICT revolution. Up until now, some of the governments in Africa are still characterised by hierarchical and rigid public bureaucracy; mainly manually operated and paper-based activities and operations;

less accountability and transparency; high corruption and embezzlement; poor participation of citizens in decision-making, poor interaction between the elected officials and electorates; and poor service delivery to citizens (Ngulube 2007: 4).

However, despite the fact that many countries in Africa are still lagging behind, there is no doubt that they are some countries which have understood the increasing role of ICT and started modernising their public administrations through ICT. In this regard, Dzidonu (2011:4) argues that today a number of countries in Africa have understood the role of ICT and have started using these technologies to smoothly run their public administrations. However, they are facing various and complex challenges and only a few e-government initiatives succeeded and produced the expected outcomes while a large number of e-government initiatives failed either partially or totally.

Chapter 2 discusses the following items:

- Contextualisation of the term e-government;
- Stages of e-government development and e-government application models;
- Nature and status of digital divide;
- Role of e-government;
- Barriers to the implementation of e-government in Africa; and
- Conditions for effective implementation of e-government.

2.2 CONTEXTUALISATION OF THE TERM E-GOVERNMENT

E-government has increasingly attracted attention, not only as part of many governments' agendas but also among scholars. Although e-government has grown rapidly as a topic of research, there is no universally accepted definition of the concept (Heeks 2007:243). Table 2.1 recapitulates different definitions of e-government.

Table 2.1: Different definitions of the term e-government

Definitions	Author(s)
1. E-government involves the use of ICTs by the government in order to support government operations and provide government services and information to citizens and businesses. However, the aim of e-government is not limited to supporting government operations but it goes even further and aims to primarily transform the production processes in which public services and information are generated and delivered, thereby transforming the entire relationships and interactions between public bodies with citizens, businesses and other governments.	Heeks (2007:246).
2. The use by government agencies of information technologies (such as wide area networks, the Internet and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government.	World Bank (2002)
3. E-government refers to government that applies ICTs to transform its internal and external relationships.	United Nations (2005: online)
4. The term e-government is defined as the use of information technology, in particular the internet, to deliver public services in a much more convenient, customer oriented and cost effective way.	Yayehyirad (2006:8).
5. E-government is defined as the use of ICTs to transform government in terms of its processes, procedures and structures by making it more accessible, effective and accountable.	SITA (in Dzidonu, 2011:3).
6. E-government is the use of ICTs by public institutions to improve service delivery by promoting more efficient and effective government, facilitating more accessible government services, allowing greater public access to information, and making government more accountable to citizens.	Palvia and Sharma (2006:2).

Considering the above definitions, the researcher argues that various authors defined the term e-government differently, but all their definitions involve the use of ICT by the public sector to streamline public administrations and to improve service

delivery to citizens. Therefore, as far as this study is concerned, the term e-government involves the use of ICT, especially the internet by a district municipality to improve the delivery of government information and services to citizens. Again, it involves the use of ICT by a district municipality to streamline existing paper-based procedures with the aim of enhancing the delivery of government information and services to citizens.

Furthermore, though e-government is often defined as online government or internet-based government, there are other non-internet electronic government technologies such as telefax, television, radio, telephone switchboard, telephone answering machine, printer and photocopy machine, scanner machine, projector, camera and fax, which can be used in the context of e-government (Heeks 2007:252). Therefore, the study may consider the non-internet electronic government technologies because they are components of ICT. The researcher argues that their presence or absence at a district municipality can undermine or not ensure the smooth process of service delivery.

2.2.1 Concepts of e-readiness, e-government readiness and e-government maturity

E-readiness, e-government readiness and e-government maturity are concepts usually discussed in connection with e-government.

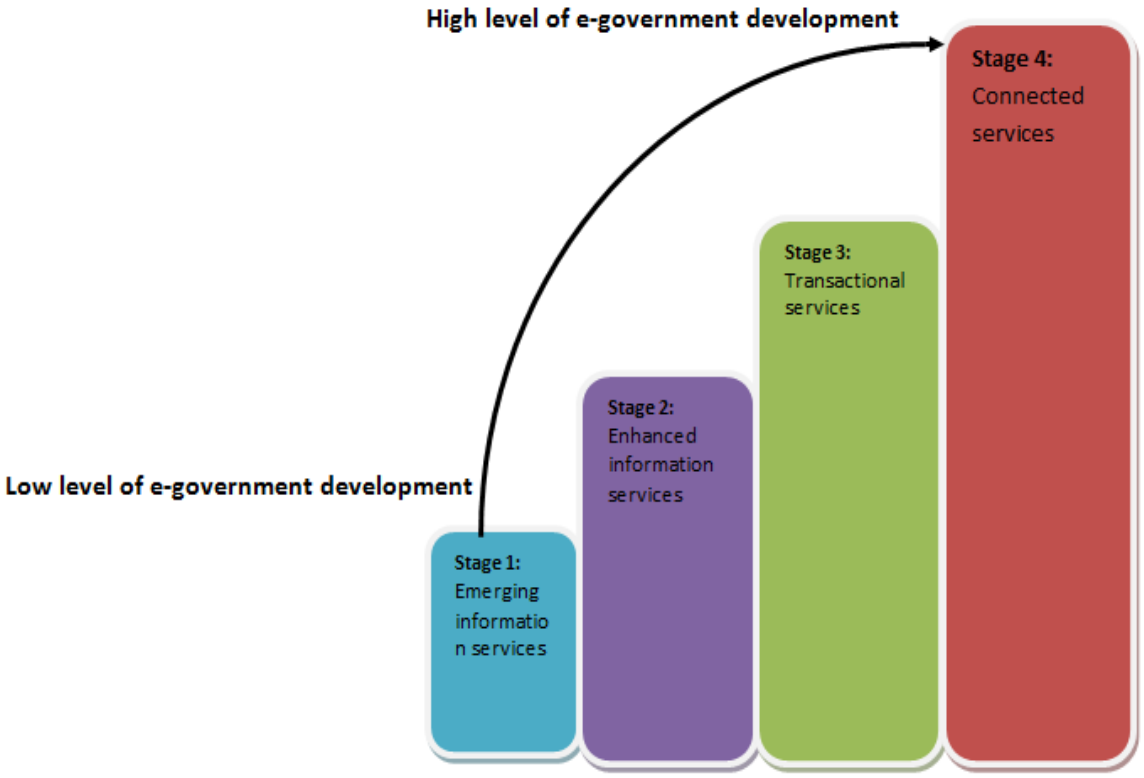
***E-readiness*:** It measures how well a society is positioned to utilise the opportunities provided by ICT for economic and social development. E-readiness therefore pertains to the overall level of society's capability to participate in and benefit from the global digital society (Tiamiyu & Kemi 2008:59).

***E-government readiness*:** It assesses how well government agencies and citizens are positioned to use ICT to provide or access e-government services. E-government readiness indices therefore usually focus on variables that measure the ICT infrastructure and human capabilities available to government and citizens, as well as the enabling nature of socio-economic and politico-legal developments and conditions (Tiamiyu & Kemi 2008:59).

***E-government maturity*:** It refers to the level to which a government has actually developed an online presence. E-government maturity indices focus therefore on the

range and sophistication of online services actually being provided by governments through their websites (ITU 2006: 19). To measure the level of e-government maturity or development of any institution, four stages of online service development are considered.

Figure 2.1: Four stages of online service development (E-government maturity)



Source: Adapted from UN (2014).

These stages indicate the level of e-government development and are used to rank the countries in terms of their level of e-government maturity.

Stage1: Emerging information services

Stage 1 is the starting or opening stage. At this stage, the government websites provide information on public policy, governance, laws, regulations, relevant documentation and types of government services provided. The websites provide links to ministries or departments and other branches of government. Citizens can easily obtain information from the websites and can follow links to archived information.

Stage 2: Enhanced information services

At this stage, government websites deliver enhanced one-way or simple two-way e-communication between government and citizen, such as downloadable forms for government services and applications. The websites also have audio and video capabilities and are multi-lingual. At this stage, however, citizens are limited to some e-services, such as completing and submitting the completed forms online (Shareef, Kumar & Dwivedi 2011:17).

Stage 3: Transactional services

At this stage, government websites engage in two-way communication with their citizens, including requesting and receiving inputs on government policies, programmes, regulations, etc. At this stage, some form of electronic authentication of the citizen's identity is required to successfully complete the exchange. Furthermore, government websites can process non-financial transactions, such as e-voting, downloading and uploading forms, filing taxes online or applying for certificates, licences and permits. Government websites can also handle financial transactions in a secure manner (UN 2014:193).

Stage 4: Connected services

At this stage, the ways of communication between public agencies change. Normally, government agencies often maintain separate databases that are not connected to other governmental agencies at the same level or with similar agencies at the local or central level. At this stage, many government departments and agencies interact more closely with their local counterparts. Consequently, central and local counterpart systems are expected to connect or, at least, communicate to each other (Lee & Layne 2001:130). At this stage for instance, if a citizen conducts a transaction with a government agency, the transaction information will be propagated to local counterparts. The various levels of systems are connected and talk to each other so that results of transactions from one system can be interchanged with another system (Shareef *et al*. 2011:18).

Based on the four stages of e-government development, Table 2.2 presents and compares the level of e-government maturity between Rwanda and South Africa. Table 2.2 also compares both countries with the Republic of Korea (South Korea) which is the world leader in the field of e-government.

Table 2.2: Comparison of e-government maturity between Rwanda and South Africa

World Ranking	Country	Percentage for Emerging Information Services (Stage 1)	Percentage for Enhanced Information services (Stage 2)	Percentage for Transactional Services (Stage 3)	Percentage for Connected Services (Stage 4)	Total
Year 2010						
148	**Rwanda**	50%	12%	1%	10%	14%
97	**South Africa**	34%	34%	27%	2%	24%
The leader in the World	Republic of Korea	97%	91%	66%	62%	78%
Year 2012						
140	**Rwanda**	92%	48%	8%	25%	30%
101	**South Africa**	100%	60%	17%	35%	40%
The leader in the World	Republic of Korea	100%	79%	92%	87%	87%
Year 2014						
125	**Rwanda**	78%	64%	19%	32%	47%
93	**South Africa**	75%	43%	12%	24%	37%
The leader in the World	Republic of Korea	100%	82%	77%	88%	86%

Source: Data compiled from United Nations e-government development surveys, 2010, 2012 and 2014.

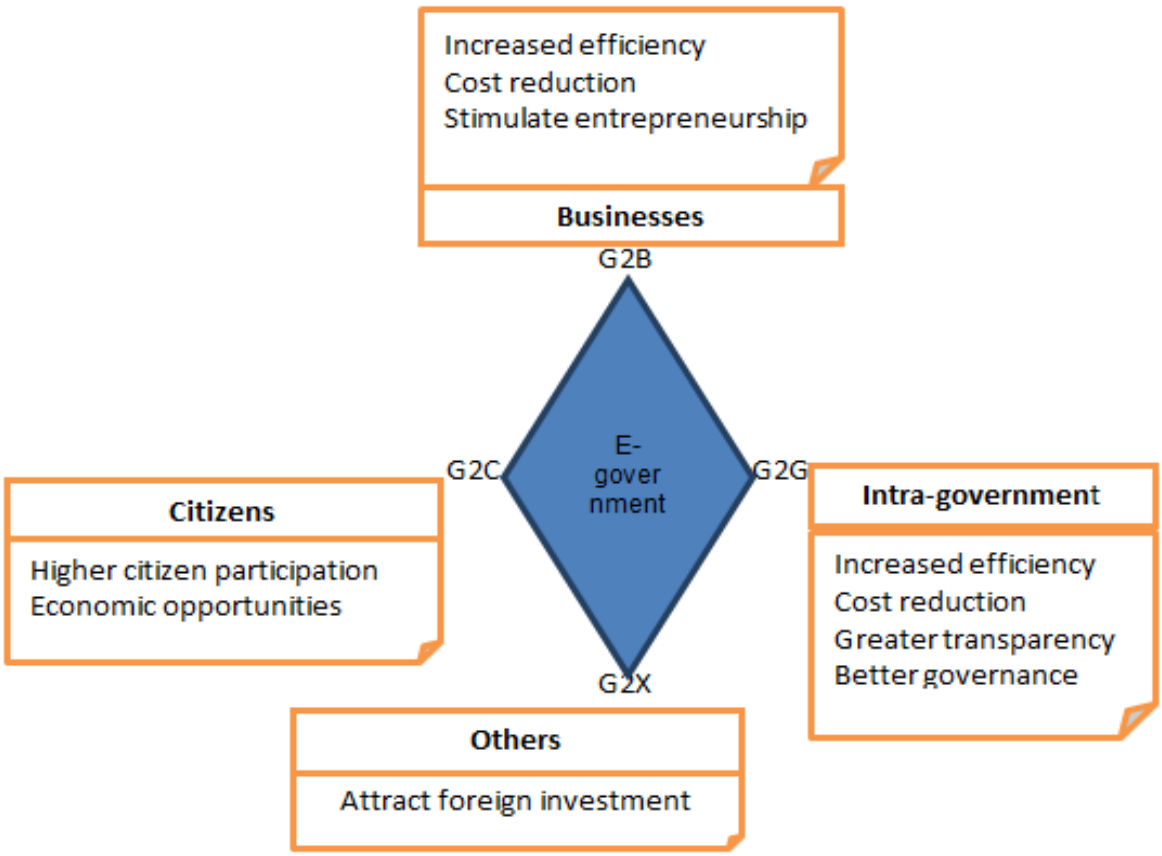
Table 2.2 shows that the level of e-government development is still low in both Rwanda and South Africa. Online services provided are mostly of stage 1 and 2. The percentage of online services of stage 3 and 4 is still minimal. In addition, the data of the table show that, while the speed to provide online services increased for Rwanda from 2010 to 2014, the speed for South Africa was slow and very slow, especially from 2012 to 2014. Furthermore, the data of the table show that both Rwanda and

South Africa are still far behind the leader in the world (South Korea) in terms of e-government development.

2.2.2 E-government application models

These models describe various ways government serves and interacts with its constituencies through the internet. E-government involves a number of defined categories of online interactions, including Government to Business (G2B), Government to Citizens (G2C), Government to Government (G2G), and Government to external partners (G2X) (ITU 2006: 23).

Figure 2.2: E-government application model



Source: Adapted from ITU (2006).

Government to Citizens (G2C)

This type of service delivery emphasises the ability of government and citizens to communicate information to each other in an electronic manner. Through online communication, citizens can easily access information and download forms and other documents which were previously only available to those who were able and willing to wait in long queues (Evans & Yen 2006:210).

Government to Business (G2B)

Government communicates electronically with businesses to seek information, provide information and transact with businesses. Through online interaction and transaction with businesses, government can reduce cost and gather adequate information from businesses which assist with decision-making. E-procurement is another example of G2B which allows government to purchase goods and services, pay invoices, and conduct business in a more cost-effective way (Evans & Yen 2006:210).

Government to Government (G2G)

E-government is used to help government to transact information within itself or with other governments in order to improve the efficiency of delivery. G2G involves the interchange of data between administrations and this allows government to communicate efficiently by eliminating redundancy and duplication (Evans & Yen 2006:211).

Government to Foreign Investors and International Organisations (G2X)

Government needs to communicate, interact and transact with external partners. G2X facilitates communication, interactions and transactions between government and regional and international partners (Gilbert 2004:291).

Based on the three indices discussed earlier (e-readiness, e-government readiness and e-government maturity) and how e-government application models are applied, different surveys conducted by the UN in the year 2002, 2004, 2006, 2008, 2010, 2012 and 2014 show the big gap in terms of ICT development and e-government in particular, between developed countries and developing countries, and especially those of Africa. For instance, the recently 2014 UN survey on e-government development shows that, despite over a billion people living in Africa making up around 15 percent of the world population, only 7 percent of the households in Africa

have access to the internet. In Europe, which has 12 percent of the world population, more than 75 percent of the households have internet access (UN, 2014:127). Furthermore, according to the UN (2014: 136), nearly 75 percent (2.1billion) of all internet users in the world live in the top 20 developed countries. The remaining 25 percent (0.7 billion) are distributed among other 178 countries, each representing less than one percent of the world total users. This gap is termed “digital divide”.

2.3 NOTIONS ON DIGITAL DIVIDE

The term “digital divide’’ refers to the gap between persons who have physical access to digital ICT, and those who do not (Alshawi & Alalwany 2009:195). According to Kroukamp (2005:56), digital divide is defined as the disparity in access to e-government services and information which may result from differences in class, race, age, culture, geography or other factors. Furthermore, Mpehle (2012:112) defines digital divide as the difference between groups in a society or community in accessing digital technology that is caused by either inclusion or exclusion. In this case, inclusion and exclusion refer to having access to and not having access to digital communication and information tools respectively. The exclusion can be caused by many factors, but the major factors are: lack of necessary skills, poverty, language barriers, lack of basic education, age and geographical location such as rural areas.

In a country or community where there is digital divide, people are categorised into two groups: the “ICT haves’’ (those who can have access to a computer and the internet) and the “ICT have-nots’’ (those who cannot afford to access the internet and buy a computer and other ICT devices). The digital divide not only excludes the “have-nots” in economic and social emancipation, but also denies them necessary information and thus, creating information inequality (Mpehle 2012:112). As one would suffer from a lack of money or resources, information poverty leaves the “have-nots” in a disadvantaged position in society. According to Bothma and Bester (2006), quoted in (Bekkers 2007:378), information poverty is defined as the situation in which individuals and communities, within a given context, do not have the requisite skills, abilities, or material tools to obtain information, interpret it and apply it appropriately.

The digital divide has multiple dimensions:

- ***Socio-economic (rich/poor).***

According to Okoli and Mbarika (2003:2), there are great disparities between high and low income regions in terms of both internet hosts and users. More than 97 percent of all internet hosts are in developed countries that are home to only 16 percent of the world's population. In addition, Kroukamp (2005:57) argues that the economically disadvantaged have the lowest levels of access to e-government services. In a country where individuals' income is relatively low, the internet is not their priority. For instance, the internet household broadband penetration is at over 97 percent in a country like the Republic of Korea, while it is 0.19 percent in Niger and 0.18 percent in Somalia (Anon, 2013: online). This disparity can be explained by their GDP per capita. The digital divide among countries and groups of individuals can be explained by differences in terms of socio-economic development level, because higher income is critical for the use of ICT. In this regard, De Beer and Wasserman, quoted in (Thakur and Singh 2013: 46), argue that the legacy of apartheid is still reflected in vast internal inequalities, making South Africa the country with the third biggest gap between the rich and poor in the world (after the USA and Brazil). These socio-economic inequalities result in a digital divide. Socio-economic issues in South Africa and Rwanda still hinder a large number of people to use and benefit from ICT. The use of the internet is still difficult for most rural people who have limited resources, who are unemployed and who are English illiterate.

- ***Gender (men/women).***

Some governmental policies, cultural and religious beliefs discourage access to information by women. For instance, in some countries men are privileged to be educated but not women. Inequalities in terms of education result in inequalities in terms of access to and use of ICTs. According to the UN (2012:19), women, especially in Africa, are normally left behind in the information revolution because of low literacy rates and lack of computer and internet skills.

- ***Geographical (urban/rural)***

According to Phang and Kankanhalli (2005:25), the majority of internet users in Africa are rich and intellectual males who can speak English or any other western language and who live in the cities. Internet users are concentrated mostly in

capitals. This argument is supported by Evans and Yen (2006:225) who state that rural areas are less well covered by the internet, due to the high cost of access and lack of electricity. In this regard, Okoli and Mbarika (2003:22) argue that in sub-Saharan African, 34 percent of the population live in urban areas and are likely to have access to ICT infrastructure while the rural majority (66%) have little if any internet access, and hence less opportunity for e-government services.

- ***Educational (educated/ uneducated)***

The gap between the educated elite and uneducated poor is wide in the developing countries, and the end result is a wide digital divide. The educated population generally has the necessary resources and means to use ICT while the uneducated cannot. The level and quality of education influence the use of the internet, because as the standard of education increases, so does the use of ICT, and the internet in particular (Bekkers 2007:379).

- ***Cultural (positive/ negative attitudes toward the internet)***

Cultural and religious beliefs toward ICT and the internet in particular can create a digital divide among communities or groups of individuals. Some see ICT as an enabling tool for socio-economic development while others see it as a threat to their cultural and religious beliefs.

- ***Political (democratic/ undemocratic)***

In countries with a high level of democracy, ICT and the internet in particular, are regarded as enabling tools to enhance political and socio-economic development, while in undemocratic regimes the internet can be considered as a threat to the security and stability of the regime (Anon 2013).

2.4 ROLE OF E-GOVERNMENT

Different authors in the domain of ICT and e-government in particular indicate that e-government helps in various ways, from streamlining public administration processes to enhancing the quality of public service delivery.

2.4.1 E-government as a way towards New Public Management

During the 1970s, the global depletion of public resources due to the misuse of the latter and the decreased quality of public services combined with social

dissatisfaction, and public mistrust of the government, led to the end of the fruitful age of the "*Welfare State*", and the beginning of a new stage in the production and provision of public services (Cordella & Bonina 2008). In the last three decades, extensive changes occurred in the political and social structures of the western world leading to a radical public sector reform and government transformation agenda. Within these changes, new modes and forms of management in the public administration were gaining predominance in the public sector scenario across many liberal democratic governments. These reforms were found to have a series of common characteristics, grouped and labelled under the notion of New Public Management (NPM) (Cordella & Bonina 2008). Various reforms under the NPM agenda were seeking to solve the problems of a public administration that was too big, too inefficient and too expensive and therefore unable to serve citizens as it was supposed to do (Cordella 2007: 267).

The use of ICT was a crucial element in many of the key components in the NPM governmental reforms. Indeed, e-government initiatives became embedded as part of NPM political and managerial reforms in many countries around the world (Cordella & Bonina 2008). Building on the experiences of the private sector, the use of ICT is perceived as a powerful tool to rationalise, streamline and re-engineer organisational procedures, and therefore, both scholars and practitioners have recognised that e-government can be an enhancer to achieve a more efficient, effective and democratic public sector, and that is what NPM aimed for (Chuttur 2009:21).

2.4.2 E-government as a way towards good governance

The concept of good governance was introduced by the World Bank (WB) in the late 1980s in order to describe the desiderata of transparency, openness and efficient public regulation and service delivery for market oriented growth (Chuttur 2009:21). The WB approach differentiates four key dimensions of governance, namely public sector management; accountability; rule of law; and transparency. According to the United Nations Development Programme (UNDP) perspective, there are four dimensions of governance:(i) Economic governance which refers to a competitive and non-discriminatory market order; (ii) Political governance which refers to participatory, democratic, legitimate, pluralist and accessible political institutions; (iii)

Administrative governance which refers to an efficient, transparent, independent and accountable public administration; and (iv) Systemic governance which refers to the existence of societal institutions that protect cultural and religious values, provide for freedom and security, and promote equal opportunities to exercise personal capabilities (UNDP 2006).

In the midst of 1990, international institutions increasingly turned to e-government as a means to promote good governance. Again, the WB has taken up a leading role with the creation in 1995 of the Information for Development Programme (INFODEV). E-government was introduced as a vehicle for the promotion of good governance and was seen as an instrument to simultaneously:

- Increase the efficiency of public administration;
- Improve public service delivery; and
- Strengthen the openness and transparency of political processes (World Bank 2002: online).

- ***Increased efficiency of public administration***

One of the most important arguments in favour of e-government is that it raises the internal production efficiency of public institutions, thus saving taxpayer's money. E-government, in general, provides two basic ways to achieve this. The first is to raise labour productivity and cut employment by means of the automation of administrative procedures and the simplification of processes. The second is to lower the costs of public procurement by means of better information on prices, promotion of market competition and more transparent and market-friendly purchasing procedures (UNDP 2006).

In this context, the researcher argues that since procurement tends to be an important area where corruption, misuse of public money and embezzlement take place in local spheres of government, it is recommended that both the governments of South Africa and Rwanda should support and encourage the effective utilisation of e-government at local government level.

- ***Quality decision***

According to Schoeman (2007:192), managers at all spheres of government need adequate and updated information. Without adequate information public officials are not only unable to identify a problem, but also unable to choose and implement the

right actions. Being able to gather information is a basic function of public and private decision-making. E-government allows the public sector to collect information. Therefore, through e-government public managers have the opportunity to make informed decisions based on the quantity and quality of information and thereby reduce the associated risks and uncertainties created by the absence of information.

- ***Improved interaction***

According to Tiamiyu and Kemi (2008: 65), online policy consultation may allow the government to obtain input from citizens on plans, budgets, bills and policies. Such interactions and consultations make policy and law makers readily accessible and accountable to their electorate, thereby placing real legislative and policy-making power more and more in the hands of citizens

- ***Openness and transparency of political processes***

E-government allows easy access to government information by civil society and other interest groups, and as such, they are better equipped to articulate their interests and hold public officials accountable (Schoeman 2007:193). The use of ICT by the local sphere of government might also enable citizens, civil societies, and other social organisations to keep a closer watch on administration, more readily exposing mismanagement and corruption, and increasing transparency, resulting in better service delivery at all local spheres of government (Chatfield & Alhujran 2009:165).

2.4.3 E-government as a way towards democracy

According to De Beer and Mokhele (2004:65), the use of ICT especially the internet, contributed to enhancing democracy in Africa. The revolutionary movements observed in some of the Arab countries could not have happened if the social media networks such as Twitter, Facebook, WhatsApp and Skype had not been used. The potential benefits of the internet for fostering the democratisation process in Africa cannot be ignored. The use of the internet during elections in South Africa is a visible example of how the internet can be used for developing the democratisation process in Africa.

2.4.4 E-government as a way towards zero corruption

According to Kroukamp (1999:49), the use of ICT in the public sector enables the government to increase transparency and thus decrease the possibility of maladministration and corruption. However, Coleman (2005:21) argues that putting more trust in ICT to the extent of forgetting managerial functions such as evaluation and control may also open up opportunities for corruption in the public sector. Total trust in computerisation and a lack of control of computerised systems will provide staff members, especially computer professionals with a low level of integrity, with opportunities to take advantage of weaknesses in control. Furthermore, Dzidonu (2011:23) argues that corruption is rooted in the cultural, political, and economic circumstances of those involved. ICT does little to affect these root causes, and has a potential role, but one that is limited and forms only part of a much larger picture. At national level, one needs political will, ethical watchdog agencies, proper incentives for honest officials, and effective punishment for the corrupt ones. At local government level, combating corruption is most effective when ethical values are part of the core business of a municipality, supporting other factors like strong leadership and a service delivery-oriented spirit.

2.4.5 Other benefits of e-government

- ***E-government improves trust between government and citizens***

According to Moon (2002:426), e-government helps the government to get closer to people, and when people feel a closer connection to government, trust and confidence in government tend to be higher.

- ***E-government provides a competitive advantage***

In today's information society people expect services to be available on a twenty-four-hour/seven-day-a-week basis. They expect simplified processes and the creation of a one-stop desk so that services and information are provided in record time. Therefore, e-government is the right answer and choice for government to be able to improve its operations in terms of service delivery and to satisfy citizens' needs (Mwololo & Mitullal 2009:237).

- ***E-government promotes accountability in the public sector***

According to Evans and Yen (2006:228), e-government can increase the opportunities available for expression and communication, and thus increases the power of citizens in relation to that of government. Therefore, the increased power of citizens may influence government to operate in a more transparent and accountable manner.

- ***E-government improves efficiency***

E-government helps to reduce costs in the public sector, because the time, money and personnel previously used in public offices to print copies, put them together and physically distribute these documents to citizens and to other government agencies can be better channelled elsewhere for increased productivity (AIshawi & Alalwany 2009:204). Furthermore, Dzidonu (2011:5) argues that the disadvantages consequent upon human fallibility are lessened when processes are automatic.

- ***E-government allows customers (citizens) to get cheaper and quality services from government***

Where there is full utilisation of e-government, citizens do not have to travel, and they do not have to spend money and time in long queues to obtain information and services. With their personal computers connected to the internet at home, and with their laptops, tablets and smartphones they can access government information, anytime and anywhere (Okemwa & Majanja 2007:26). E-government saves customers' money in the form of faster, easier and more convenient services. For instance, a personal identity document can be issued within one hour using ICT solutions whereas it could take thirty days before reform, and sometimes requiring citizens to queue for up to eight hours.

- ***E-government allows the previously disadvantaged citizens to access government information***

According to Kroukamp (2005:51), the utilisation of e-government allows the government to provide the same public services and information to citizens equitably, and in a manner that is accessible to all, and therefore it has the capacity to reduce inequality and information poverty among citizens.

The utilisation of e-government does not only have benefits, but some challenges arise from the utilisation of e-government. The following section presents the pitfalls of e-government.

2.5 CHALLENGES ASSOCIATED WITH E-GOVERNMENT

Difficulties can arise in the design, implementation, and updating of e-government websites. The first challenge of e-government is that even the simplest error can result in confusion and a big loss of data (Transparency International 1998). According to Kroukamp (2005:55), the following are serious problems which can emanate from e-government:

- ***Security:*** Government will need a significant amount of money to protect its information and systems from breaches of computer security that threaten not only the integrity and availability of services, but also the confidence of users. 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;
- ***Privacy:*** The use of electronic databases to store information is rapidly eroding the concept of the individual's right to privacy, as databases share and match personal details with ease;
- ***Digital divide:*** The disparity in access to e-government may worsen the disparities and classes within the community. Some citizens may find to be more marginalised;
- ***Education:*** At any level of income, individuals with better education have higher rates of internet usage than others, while those with lower levels of education tend to show the least interest in learning to use the internet or going online (Kumar, Mukerji, & Persaud 2007:72). Therefore, to avoid the digital divide and to promote social equity, governments should not only invest in e-government, but should also invest more to raise the standard of education. Investment in e-government initiative should go hand in hand with investment in better education;
- ***Accessibility:*** Governments must serve all members of society without any discrimination. Therefore, government should ensure that individuals with disabilities can use e-government. Meeting the needs of people with disabilities

presents particular challenges as many of the changes that generally make it easier for non-disabled people to use computers can create barriers for people with disabilities. To ensure that disabled people are accommodated and their needs to use e-government are satisfied, governments need to invest more money to ensure that hardware and software programs are in place for the use of people with disabilities;

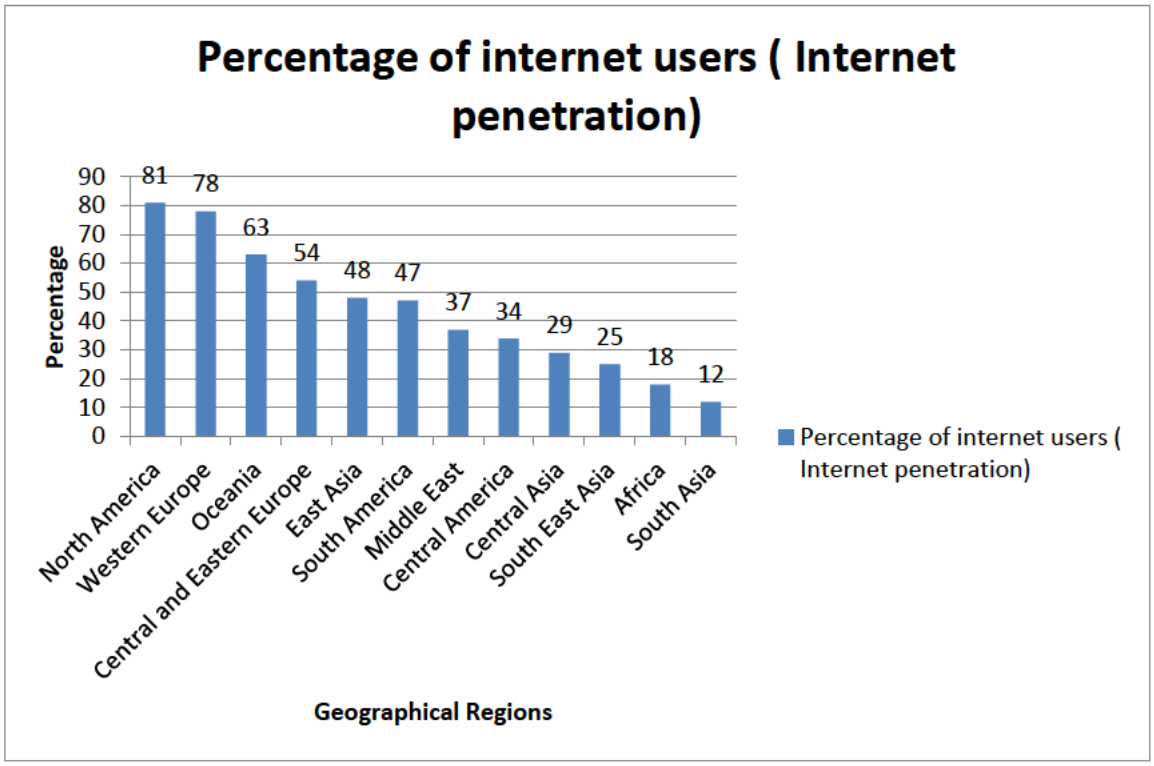
- ***Expensive:*** The implementation of e-government requires governments to invest a considerable amount of money. Thus there is danger in embracing e-government at the expense of more basic functions of government. The implementation of e-government may compromise the provision of basic services, such as water, electricity, better roads and housing for poor citizens; and
- ***Citizen awareness and confidence:*** The challenges involved in the implementation of e-government are not technological *per se* creating awareness of the advantages of e-government and persuading people to become users of the system are bigger challenges (Mpinganjira 2012:503). Government cannot over-ambitiously assume that citizens will automatically adopt and be confident in the use of e-government. Sensitisation and education in such usage is an ongoing process which takes time and effort to deliver results (Accenture 2003:23).

2.6 E-GOVERNMENT DEVELOPMENT IN AFRICA

The parameters which are taken into consideration to measure the level of e-government development are termed 'E-government readiness index'. According to Yayehyirad (2006:16), an e-government readiness index is a composite comprising the Web Measure Index (WMI), the Telecommunication Infrastructure Index (TII) and the Human Capital Index (HCI). According to a United Nations e-government survey in 2012, the top twenty countries in terms of e-government development were high-income developed economies. None of the African countries is among the top twenty global leaders in terms of e-government development (UN 2012: online).

Figure 2.3 shows the level of internet penetration by geographical regions. It shows the percentage of people who are using the internet in each geographical region of the world.

Figure 2.3 : Internet penetration per geographical regions



Source: Data from UN e-government development survey (2012).

According to Figure 2.3, only 18 percent of the total population in Africa can use the internet. Globally, according to Kayobi (2014: 6), Africa becomes the last and least region of the world in terms of the percentage of internet users, social media users and mobile subscribers. Only 18 percent are internet users, 7 percent are active on social media networks and 67 percent have active mobile subscriptions. In addition, ITU report (2013:online) shows that while Africa covers 6 percent of the Earth's total surface area and 20 percent of the total land area, it represents almost 8 percent of the World's total internet users.

However, according to ITU (2013: online) the future is promising. The continent's internet users are expected to continue to accelerate, led by large African internet markets such as South Africa, Nigeria, Egypt and Kenya. As ambitious internet projects are undertaken by different countries and other projects such as Facebook's internet.org and Google's Africa internet access projects continue, hundreds of millions of Africans are expected to come online and partake in the opportunities offered by the internet (ITU 2013: online).

2.7 CHALLENGES FOR EFFECTIVE IMPLEMENTATION OF E-GOVERNMENT IN AFRICA

According to Okemwa and Majanja (2009:19), the opportunities offered by ICT are unlikely to be fully realised in Africa at present, because of different challenges. The following challenges explain the slow development of e-government in Africa:

- ***Lack of or insufficient budget***

African governments have far less money in both absolute and per capita terms to spend on ICT than developed countries. According to Dzidonu (2011:11), most of the governments in Africa do not have the necessary financial resources to invest in the implementation of a comprehensive e-government system across all government departments, public agencies, and local spheres of government and within the community at large. The e-government projects in sub-Saharan countries are being implemented on a piecemeal basis, because most of the time funds become available from donor sources, namely governments, international institutions such as WB, IMF and other NGOs. Therefore, significant parts of the implementation of e-government in the majority of the African countries are likely to depend on the availability of donor funding. The consequence of fund dependence is that the donor country or NGOs will dictate the pace and areas of focus of the implementation process. E-government development is not only hampered by the inability of the government to raise the budget for telecommunication infrastructure, but also by poverty among citizens who are not able to pay for e-government services. In this regard, De Beer and Mokhele (2004:71) argue that the high levels of poverty, where almost 47 percent of sub-Saharan Africans live on less than $1 a day, make access to the internet a luxury in many African countries.

- ***Lack of enabler institutions***

In most African countries, e-government programmes were undertaken before institutions' facilities to co-ordinate, lead and drive e-government were put in place or given enough resources to function (Dzidonu 2011:12).The setting up and the strengthening of the capacity of enabling institutions are critical for the e-government take-off in African countries.

- ***Lack of institutional and organisational system reforms***

The implementation of e-government in most African countries will not be possible without institutional reforms and the re-engineering of organisational processes, structures, budgets and procedures within government departments and agencies (Ntetha & Mostert 2011:127).

- ***Lack of insufficient human capital***

The attitudes, knowledge and skills that are required to initiate, implement and sustain e-government initiatives are lacking, especially within the public sector (Ntetha & Mostert 2011:125). In this context, Dzodonu (2011:10) argues that some of the African countries lack human resources with necessary technical and professional skills critical for supporting the development and roll-out of their e-government projects. The lack of skilled human capital leads to poor technical design and poor coordination. In addition, Okoli and Mbarika (2003:20) state that, due to a lack or insufficient computer science programs in schools to develop an indigenous base of software developers, most countries in Africa are overly dependent on foreign technicians and consultants in terms of the maintenance of telecommunication infrastructures and the development and enactment of key telecommunications policy guidelines respectively. Such dependency on expatriates may not help with developing the necessary expertise among nationals for the development and maintenance of the systems (Okoli & Mbarika 2003:20).

- ***Lack of e-government enabler laws and legislative provisions***

The laws and regulations required to permit and support the move to e-government are not in place or are not clear enough in most African countries. For instance, in most of the countries laws related to security, privacy, electronic signature, intellectual property and copyright, data sharing, authentication, regulation and liberalisation of telecommunication are not in place or lack clarity (Dzidonu 2011:11). However, some countries have understood the role of clear laws and regulations to enhance e-government development. For instance, the legislation to ensure security was promulgated in South Africa, and includes among others, the Electronic Transactions Act of 2002 and the Interception and Monitoring Prohibition Act of 1992 (Ntetha & Mostert 2011:128).

- ***Lack of telecommunication infrastructure***

The development of e-government is directly proportional to the IT infrastructure that is capable of supporting and enabling the execution of e-government. An e-government infrastructure in general comprises network infrastructure, security infrastructure, application server environment, data and content management tools, hardware and operating systems, etc. However, many developing African countries do not have the infrastructure necessary to deploy e-government services throughout their territory (Basu 2004:117). A lack of or insufficient telecommunication infrastructures negatively affect the price of internet and other ICT services. High costs of bandwidth and electricity limit access to the internet and other ICT technologies in Africa (Okemwa & Majanja 2009:30). In Rwanda for instance, the cost of internet access per hour in the cybercafé is 300 Rwandan francs which is high if one considers the financial capacity (annual income) of the majority of Rwandans. The cost of internet access in most cybercafés in South Africa is R10 per hour, which is approximately equal to 500-600 Rwandan francs. It can be deduced that the price of internet access is higher in cybercafés in South Africa than in Rwanda. However, access to the internet might be more difficult for Rwandans than South Africans because of their financial capacity (GDP per capita in South Africa is much higher than in Rwanda).

- ***Lack of or insufficient electricity***

Lack of or irregular availability of electricity creates problems for businesses and people reliant on ICT for service delivery and communication (Okemwa & Majanja 2009:30). For instance, only 17 percent of the population in Rwanda has access to electricity (National Institute of Statistics of Rwanda, 2012: online) and therefore the majority of 83 percent do not have electricity and consequently cannot utilise ICT and access e-government services. Though access to electricity is not a big issue in South Africa some households do not have access to electricity, especially in rural areas (Ntetha & Mostert 2011:125).

- ***Lack of leadership and strategic thinking***

A critical pre-condition for successful e-government is an e-champion or a group of e-champion leaders with the vision who put e-government onto the agenda, who set e-government within a broader reform agenda, and who make it happen. In Africa,

there are a limited number of leaders who feel willing or able to champion ICT in their governments (Heeks 2002:10). E-government is unlikely to be implemented in a country where there is poor leadership, which is lacking a clear e-government vision in policies, as well as the capacity to lead change (Matteson & Jaeger 2009:87).

In the last 10 years, Rwanda has made significant progress in the utilisation of ICT because of top leadership commitment towards e-government, especially the president of the Republic of Rwanda who is committed and willing to make Rwanda an ICT hub in the region. In this regard, the UN e-government survey 2014 indicated that Rwanda is the best performer in terms of ICT development in the category of low-income countries. In addition, it was ranked the leader in the category of low-income countries in terms of online service delivery, and was ranked 63rd globally (UN 2014: 53).

- ***Social issues***

These include poor basic education, low literacy levels, poor IT literacy, and lack of public acceptance of e-services due to the shortage of skills. The illiteracy rate in Africa is said to be high if compared with other continents.

- ***Resistance to change***

There is still a resistance to change and a desire to cling to outdated service delivery methods by staff, and reluctance by citizens to use e-government services. For instance, Matteson and Jaeger (2009:90) found in their research that though in some countries e-government has reached a satisfactory level where government services and information can be accessed online, citizens, however, still show a strong preference for phone-based or in-person interaction with government representatives when they have questions or are seeking government services and information. The preference of traditional ways of service delivery is still dominant. Resistance to the new changes by citizens, especially the poor and illiterate, is a big challenge.

Previous research on e-government development in Africa indicated that some countries initiated e-government projects and started the implementation, but few e-government initiatives succeed and produce the expected outcomes, while a large number of e-government initiatives failed (Shareef, Kumar & Dwivedi 2010:71).

The following subsection explains the causes and consequences of e-government failures in Africa.

2.8 CONSEQUENCES OF E-GOVERNMENT FAILURES IN AFRICA

According to Heeks (2003:2), the estimates of e-government failures in developing countries, especially in sub-Saharan countries, are as follows: 35 percent of e-government initiatives were estimated total failures. This means that 35 percent of initiatives were never implemented or e-government initiatives were implemented but immediately abandoned. Fifty percent of e-government initiatives were estimated partial failures. This means that 50 percent of the major goals for the e-government initiatives were not achieved and/ or there were significantly undesirable outcomes. 15 percent of e-government initiatives were estimated successful. It means only 15 percent of e-government initiatives attained their major and expected goals and did not experience undesirable outcomes.

The costs of these failures are high and negatively affect the development of the country and citizens' lives due to the huge amounts of money that were lost but which should have been invested in projects that benefit citizens. Furthermore, Heeks (2003:4) names six categories of potential costs of e-government failures in Africa:

- **Direct financial costs.** The direct financial costs include the amount of money invested in various equipment, experts and consultants, new facilities, money invested in different training programmes and different meetings;
- **Indirect financial costs.** As time is money nowadays, the indirect financial costs include the money invested in the time and different efforts of public servants and other stakeholders involved;
- **Opportunity costs.** The missed opportunity of spending that money in better ways to the benefit of citizens rather than having been lost on e-government failure;
- **Political costs.** This involves the loss of reputation, consideration and loss of image for individuals, organisations and countries involved in failure. Citizens may lose confidence and trust in individuals, authorities and organisations involved in failure;

- **Beneficiary costs.** People expect much from any government project. However, in the case of failure all benefits that a successful e-government project would have brought are lost; and
- **Future costs.** Because of failure, individuals, organisations, and governments are discouraged from investing in e-government projects in the future. The failure of e-government projects increases the barriers to upcoming e-government projects. Due to failure, e-government champions in particular lose courage to initiate other e-government projects in the future.

The question which immediately comes to the researcher's mind is why only a few e-government projects succeed and so many e-government projects fail in Africa? To answer the question, Heeks (2003:3) argues that e-government success and failure depend, among other things, on the size of the gap that exists between current realities and the design of the e-government project. The larger this design-reality gap, the greater the risk of e-government failure. The failure is caused by the large gaps that exist between project design and African public sector reality. The gaps arise specifically because e-government concepts and designs have their origins in the West, origins that are significantly different from African realities. The best e-government practices from the Western European countries can only be implemented if they are appropriate and adapted to African realities.

The size of an e-government project can also cause its failure. Undertaking very large ICT projects often end up in total or partial failure in most African countries. In Rwanda for instance, the Kalisimbi tower project (Communication Navigation Surveillance and Air Traffic Management project) failed partially because it was a major project that required highly specialised skills and technology and huge amounts of money that the government did not have.

The failure can result from private-public gaps. According to Heeks (2003:5), there are differences between the public and private sectors. However, some government officials forget this reality. They make the mistake by taking an information system designed for the private sector and trying to transfer or install it into a very different public sector reality. This ignorance of the difference between the private and public sector creates large design-reality gaps which ultimately lead to failure. To minimise failures, governments in Africa should customise and adapt information systems

from the private sector to e-government projects, and not just adopt and implement them.

If e-government has been implemented and has produced positive impacts in other regions of the world, especially in Europe and the Americas, governments in Africa can also implement e-government successfully and take advantage of ICT. However, some conditions should be met. The following section presents some of the conditions which are critical for the successful implementation of e-government in Africa.

2.9 CONDITIONS FOR SUCCESSFUL IMPLEMENTATION OF E-GOVERNMENT

Different scholars in the domain of e-government suggested different factors and conditions for the successful implementation of e-government.

- ***Full-involvement and commitment of top-level political and economic leadership***

The involvement of senior leadership of the country and other key stakeholders affects the success of e-government. A sustained championship of the national ICT process including e-government by the top political and economic leadership will be required if e-government projects being implemented by African countries are to succeed (Dzidonu 2011:17). In this context, Thakur and Singh (2013:48) argue that countries in which the senior political leadership, in particular the President or Prime Minister of that country has played a leading championing role in moving the nation's e-government agenda, have demonstrated significant progress in e-government development, as opposed to those where the top leadership played a minimal or no role at all.

- ***Commitment of senior administrative, managerial and technical personnel within statutory national e-government implementation coordination agencies***

The successful implementation of e-government in Africa will to a large extent depend on the effectiveness of the principal role that the statutory national e-government implementation coordination agencies play in supporting the development, management and deployment of the required e-government systems and services (Dzidonu 2011:18). In this regard, the role of the State Information

Technology Agency (SITA) in South Africa, and the role of the Rwanda Development Board-Information Technology (RDB-IT) in Rwanda are critical and will determine the success or failure of e-government in both South Africa and Rwanda. Furthermore, Dzidonu (2011:19) states that leadership provided by senior administrative, managerial and technical personnel, expertise and manpower within an established national institution tasked with the responsibility to coordinate the development and implementation of the national e-government will be critical for the success of e-government. In this regard, the sound choices or recruitment of managers of SITA and RDB-IT are critical. In addition, because of the high rate of turnover of IT technicians in the public sector that migrate to private companies, retention mechanisms including the provision of competitive remuneration packages and a clear career progression path for IT personnel within the public service are also deemed critical.

- ***Availability of a critical technical expertise corps***

E-government development requires critical technical skills and expertise to develop and support critical back office systems, network infrastructure, database systems and to implement and support the provision of a number of front office e-government services (Lee & Layne 2001:130). The critical expertise required will include network backbone infrastructure engineers, cyber security system experts, system developers and support staff, senior system administrators and management personnel (Lee & Layne 2001:134).

- ***Proper legal framework***

The success of e-government initiatives and processes is highly dependent on government's role in ensuring a proper legal framework for their operation. For instance, the legal recognition of digital signatures is necessary if they are to be used in e-government for the submission of electronic forms containing sensitive personal or financial information (Basu 2004:120).

- ***An information literate citizenry***

In Africa, especially the sub-Saharan region, literacy levels are low and computer literacy levels are even lower (Okemwa & Majanja 2009:34). To change this state of affairs, governments should put more focus on quality education for all, but also a special programme, which can be called "Access to basic ICT skills for all", should

be introduced. In this regard, the government of Rwanda established a one-laptop-per-child programme. Since 2006, more than 200 000 laptops were purchased by the government and distributed to primary schools around the country. This programme aimed to enhance IT culture and computer literacy from the basic level. However, the adult and the poor are left behind, because the programme does not reach them. In South Africa, the government has created the Multi-Purpose Community Centres (MPCCs) in order to raise the access facilities but also to raise the level of ICT literacy among rural populations. In addition, the government increased the number of computers for the schools and colleges (Basu 2004: 112).

- ***Adequate ICT infrastructure.***

E-government service delivery is very much contingent on fast and reliable internet connection. However, the required infrastructures to boost e-government, such as bandwidth, physical installations, hardware, software and human capacity for technical support are extremely deficient in many countries in Africa (Thakur & Singh, 2013:44). Mobile telephone and internet services are often monopolised by international companies, and the results are poor telecommunication services and higher prices for mobile telephone and internet services. The liberalisation of telecommunication markets and competition of telecommunication companies would boost ICT infrastructures in Africa (Thakur & Singh 2013:46). Furthermore, there should be strong public-private partnership to boost ICT infrastructure in Africa, and local or regional investments should be encouraged. E-government success requires active partnership between government, citizens and the private sector.

- ***Relevant online services and information***

People are interested in buying something if they find it relevant, useful, cheap or affordable. If something is neither relevant nor useful, is difficult to use, then they lose interest in getting it. In this context, when e-government services are perceived irrelevant, not useful and difficult to find, the user will not be interested. Therefore, government should make sure that users are motivated to use online government information and services (Backus 2001: 13).

Another important factor which may motivate citizens to use e-government services is to provide the opportunities to give feedback and views about important issues. Therefore, online discussion forums where citizens can raise issues and give their

views are all important factors that can encourage users to use e-government services.

- ***Integral reform of public institutions***

E-government is about transforming government institutions to be more citizen-centred. Therefore, e-government successes demand changing how government works, how it deals with information, how officials view their jobs and interact with citizens. E-government and ICT should be seen and considered as elements of a larger government modernisation programme (Farelo & Morris 2006:4). Purchasing and increasing the number of computers, photocopy machines, free wi-fi, printers, scanners, fax, etc. will not necessarily improve government, but will only automate the same old procedures and practices if integral reform of the public sector was not done beforehand.

2.10 SUMMARY

Since 1990, attention has been given to e-government and many governments in the developed world embraced the opportunities offered by ICT to improve the performance of their institutions, accelerate their socio-economic development, transform business processes and practices and offer value-added services to their citizens. ICT was taken as an enabler tool which can help public institutions to rationalise the processes and procedures by simplifying and minimising the time to execute the administrative tasks and the timeframe to deliver services to citizens. In addition, ICT was taken as an enabler tool to promote efficiency, accountability, transparency, equity and zero corruption not only in the public sector, but also in local spheres of government.

Although developed countries have understood the role of ICTs since 1990, and started using them in their public administration, countries in Africa were left behind and are still lagging behind. Based on 3 indices, such as e-readiness, e-government readiness and e-government maturity, various surveys conducted by the UN showed that Africa is the last and least connected continent, where only 7 percent of households in Africa have access to the internet while in Europe more than 75 percent of households have internet access. Some factors that explain this digital

divide are, among others, GDP per capita, quality of education and ICT infrastructure development.

A significant number of e-government projects were undertaken in Africa, but only a few have succeeded and a large number of them failed to produce the expected outcomes. The challenges to the effective implementation of e-government in Africa have been identified, namely limited financial resources of the countries; funding dependency; insufficient ICT infrastructure and other infrastructures such as electricity; high level of illiteracy among the population; low ICT literacy rate; lack of top political leadership commitment to e-government; and weak or inefficient public agencies in charge of implementation, monitoring and coordination of e-government initiatives.

If e-government was successfully implemented by different developed countries and produced the expected outcomes, it can also be implemented successfully by countries in Africa. However, some conditions should be met, such as the full involvement and commitment of top-level political and economic leadership; the availability of critical technical expertise corps; a proper legal framework; an information literate citizenry; an adequate ICT infrastructure; and an integral reform of public institutions.

Chapter 3 presents the status of e-government development in both South Africa and Rwanda, and subsequently compares the two countries. Finally, it presents the developmental role of local spheres of government and the role that new ICT can play to make local spheres of government more developmental and service delivery more citizen- orientated.

CHAPTER 3: THE DEVELOPMENT OF E-GOVERNMENT IN SOUTH AFRICA AND RWANDA

3.1 INTRODUCTION

Overall, e-government development remains at a very low level in Africa. The E-Government Development Index (EGDI) average in Africa is 0.2661 below the world average of 0.4712, placing the African continent the last among other continents (UN 2014: online). A lack or inadequate ICT infrastructure, low GDP per capital, high illiteracy rate and inadequate human capital are among the major challenges facing the African continent. However, despite low progress by Africa in general, some countries have made significant progress in terms of ICT and e-government development. Tunisia and Mauritius are the two highest-ranked countries in Africa, with Egypt, Seychelles, Morocco and South Africa following closely behind.

Though Rwanda is not among the top 10 countries in Africa, the country has experienced an exponential development in terms of ICT infrastructure, in human capital development and internet and mobile subscriptions over the last 10 years. Because of improvements made in the last 10 years, Rwanda was ranked the best performer among the categories of low-income countries according to the UN e-government survey in 2014 (UN 2014: online).

Due to a number of factors, there are disparities between Rwanda and South Africa in their state of ICT and e-government development. The disparities in terms of their socio-economic capacities explain, in one way or another, the disparities which can be observed in their state of ICT and e-government development. The income level of a country is a general indicator of economic capacity and progress, which in turn influences its e-government development. Access to ICT infrastructure and the provision of quality education, including ICT literacy, are related to the income level of a nation. However, according to the UN (2014) the national income does not, by itself, guarantee ICT development and e-government development in particular. There are many countries that have significantly advanced their e-government despite relatively low national income, just as there are many countries which are lagging behind despite their relatively high income. The income of a country backed

by strong leadership and strong political will and commitment toward e-government development are critical.

Chapter 3 addresses critical aspects related to e-government development in South Africa and in Rwanda.

3.2 E-GOVERNMENT DEVELOPMENT IN SOUTH AFRICA

South Africa is ahead of other sub-Saharan African countries in the use of ICT for e-government. The government of South Africa has moved beyond using its websites to not only provide information, but also to provide government services to the citizens (Okoli & Mbarika 2003:45). Such online services include the downloading and completion of government forms online, and paying for services through e-payment systems (Okoli & Mbarika 2003:46).

South Africa was a recognised Africa leader in the use of ICT and is ranked amongst the top performers not only in Africa but also amongst middle-income countries. However, the UN e-government survey 2012 shows that South Africa has lost its position of being ICT top performer or leader in Africa, because it was overtaken by the Seychelles and Mauritius. This was due to many factors, one of which might be that ICT, and especially e-government development, was not among the top priorities on the agenda of the political leadership in place.

Table 3.1: Top 10 ranked countries in Africa in terms of e-government development

Top ranked countries in Africa		E-government development index		World e-government development ranking	
Rank	Countries	Year 2012	Year 2010	Year 2012	Year 2010
1	Seychelles	0.5192	0.4179	84	104
2	Mauritius	0.5066	0.4645	93	77
3	South Africa	0.4869	0.4306	101	97
4	Tunisia	0.4833	0.4826	103	66
5	Egypt	0.4611	0.4518	107	86
6	Cape Verde	0.4297	0.4054	118	108
7	Kenya	0.4212	0.3338	119	124
8	Morocco	0.4209	0.3287	120	126
9	Botswana	0.4186	0.3637	121	117
10	Namibia	0.3937	0.3314	123	125
18	Rwanda	0.3291	0.2749	140	148
Regional (Africa) Average		0.278	0.2733		
World Average		0.4882	0.4406		

Source: United Nations e-government survey, 2012.

According to Table 3.1, South Africa increased its e-government development index in 2012 compared to 2010, but lost 3 places in world e-government development ranking. This means that there are countries that are doing things better and developing faster than South Africa.

3.2.1 Motivation for e-government implementation in South Africa

According to Bernard, Cloete and Patel (2003:35), the demand for e-government services in South Africa has arisen from requirements to:

- Improve the efficiency and quality of government services;
- Ensure that government services are delivered to all levels of society anytime and anywhere in South Africa;
- Enhance government's portfolio of services;
- Consolidate transparency and accountability in the delivery of government services; and

- Enhance citizens' participation in decision-making and provide citizens with feedback mechanisms.

In addition, Farelo and Morris (2006:2) indicate that the government of South Africa introduced e-government because it wanted to develop an information society and harness the power of ICT for the economic and social development of the country. The government has understood that e-government is part of various public service transformations guided by the principle of public service for all (Batho Pele Principles). The transformations further indicate that, in its vision of 2014, the government of South African wanted to see its society transformed into an information society, one in which the use of ICT will be harnessed to ensure that everyone has fast, reliable and affordable access to information and knowledge that will enable citizens to participate meaningfully in the governance process and the economy.

Furthermore, Schoeman (2007:185) argues that the e-government vision in South Africa was informed by the growth and development priorities expressed in Vision 2014 as well as the Millennium Development Goals whereby ICT was considered as an enabler for the achievement of these goals within a broad and integrated developmental approach, rather than merely an infrastructure. E-government was firmly seen as an integral pillar for developing a South African information society.

Vision 2014 for e-government was expressed in the approved e-government discussion document titled "Electronic Government, the Digital Future: A Public Service IT Policy Framework" published in 2001 by the Department of Public Service and Administration (DPSA). The document recommended that an e-government initiative in South Africa should address three main domains:

- **E-government.** The application of IT intra-governmental operations (Government to government (G2G);
- **E-service.** The application of IT to transform the delivery of public services (Government to Citizens (G2C); and
- **E-business.** The application of IT to transact business and operations performed by the government (G2B) (Farelo & Morris 2006:4).

To become an information society, an enabling policy, a regulatory environment, ICT infrastructures, broadband connectivity, and an appropriately skilled and knowledgeable citizenry were critical. In this regard, South Africa has made progress in creating an environment conducive to e-government deployment and development.

3.2.2 Progress made in creating an environment conducive to e-government development

The successful implementation of e-government requires the government to make changes in order to create an environment conducive to e-government development:

- ***Enabling policies***

According to Ntetha and Mostert (2011: 127), the policies in relation to ICT were founded on two pillars:

- ICTs are put in place and used to make sure that services to all South African citizens are delivered faster, cheaper, better and in a sustainable manner; and
- ICT tools and information are key drivers of economic and social development.

A number of policy measures have been identified as critical in creating an enabling environment for the implementation of e-government, including among others: The Freedom of Information Policy; Information Communication Policy; Universal Access Policy, and Universal Services and Access to Information Act. All of these policies and others enable the constitutional right of access to information (Farelo & Morris 2006:5).

In addition, the Green Paper on electronic commerce for South Africa was published in November 2000. This paper regulates the conduct of monetary transactions online (Kroukamp 2005:62).

In February 2001 the government of South Africa introduced a document drawn up by the DPSA “Electronic government: the digital future and IT policy framework”. The framework established by this document can be considered as a major step towards guiding government institutions into the digital age and thus making South Africa more competitive in terms of ICT development. The framework specifies guidelines

for making government more productive and more effective in delivering online services. It provides indications of how the government intends to address the challenges of interoperability, privacy, IT security and the elimination of duplication (Kroukamp 2005:63).

Other policies, formulated year-on-year, include among others: Minimum Information Security Standards (MISS); Handbook on Minimum Interoperability Standards (MIOS); Electronic Communication Transaction Act of 2002; and the Law Commission Issue Paper on Privacy Public Service Act (Ntetha & Mostert 2011:127).

- ***Regulatory bodies***

ICT responsibility for national and provincial government resides within the DPSA. Government agencies in charge of implementation and coordination were created, including the SITA, which was created as a central, shared service provider to government departments and provinces. SITA was established in 1999 by an Act of Parliament (Act 88, 1998) to consolidate and coordinate the State's information technology resources in order to achieve cost savings through scale, increase delivery capabilities and enhance interoperability (Dzidonu 2011:24). SITA focuses on leveraging IT as a strategic resource for government, and by managing the IT procurement and delivery process, to ensure that government gets value-for-money. SITA's mandate include among others:

- Improving service delivery to the public through the provision of information technology;
- Improving information systems and related services in a maintained information system and security environment; and
- Promoting the efficiency of government departments and public bodies through the use of information technology (Dzidonu 2011:25).

In addition to the creation of SITA, the Government IT Officer's Council (GITOC), was formed to encourage and facilitate a forum for the consultation and deliberation of ICT related issues. The GITOC is an advisory body to the Minister of DPSA about ICT and other related issues. Also, the office of the Government Chief Information Officer (CIO) was created within DPSA to act as a policy-making, regulating and strategy formulating body with the specific purpose of coordinating e-government activities across government departments (Farelo & Morris 2006:3).

- ***Telecommunication infrastructure***

In the domain of telecommunication infrastructure, the Republic of South Africa is the leader in Africa and the 20th largest consumer of information technology products and services in the world. The country has a network that is 99 percent digital, and includes the latest in fixed-line, wireless and satellite communications. The Republic of South Africa has the most developed telecommunications network on the continent. Many international corporations, highly recognised in the IT domain, operate subsidiaries from South Africa. South Africa was the 15th largest telecoms market in the world in 2012 (http://www.mushroomnetworks.com/blog/2013/09/06/).

The Republic of South Africa also has a strong mobile phone industry, 15 public broadcast-service radio stations, 3 commercial radio stations broadcasting in 11 languages and an external radio service in 4 languages that reaches an adult audience of on average 19 million. There is a public broadcasting-service radio station for each language group (Ntetha & Mostert 2011:127). The SABC television network consists of three-spectrum, free-to-air channels, and one satellite pay-television channel aimed at audiences in Africa. A daily adult audience of almost 20 million people is reached via the terrestrial signal distribution network and a satellite signal (Ntetha & Mostert 2011:128).

- ***Computer and internet penetration***

The use of computers in South Africa has gained momentum in the past decade. According to Mpehle (2012:115), there are more households which have computers than there were, for instance, in 2001. The number of households with computers has grown from 8.6 percent in 2001 to 15.6 percent in 2007, a growth rate of 7 percent. This percentage has risen to 25.5 percent in 2013 (Anon, 2013: online). According to De Lenerolle (2011: online), the use of ICT, especially computers, was facilitated by the access to basic infrastructures such as electricity. In South Africa for instance, 89 percent have access to main electricity; 75 percent have water at home; 78 percent have TV at home; and 62 percent have radio at home.

The access to and use of the internet in South Africa has risen dramatically. In 2008 a study by World Wide Worx reported that South Africa had 5.2 million internet users, about 15 percent (Anon 2010: online). This percentage had risen to 34 percent in 2011 (De Lanerolle 2011: online). The recent figures on global internet

penetration show that the number of internet users in South Africa had risen to 41 percent in September 2013 (Kayobi 2014: online).

According to the State of Broadband Report 2013 released by the UN Broadband Commission, 41 percent of internet users place the country in 5th position in Africa and 92nd worldwide, and this percentage is above the world average of 35.5 percent. The report further shows that 25.5 percent (just over a quarter) of South African households have internet at home, placing the country 5th in Africa and 44th among 128 developing countries surveyed (http://www.screenafrica.com/page/news/mobile-tv/1639686-Africas-digital-penetration-in-2014).

However, despite the progress made, the digital divide is still a big challenge in South Africa. According to Kroukamp (2005:61), South Africa is part of the three countries in the world (United States of America, Brazil and South Africa) where the gap between the rich and the poor is still too large. The disparities in terms of income and level of education engender a digital divide, whereby those with low income and low level of education are deprived to benefit from ICT. In an effort to narrow the digital divide, a large number of internet access facilities, commonly known as Multi-Purpose Community Centres have been introduced by the government of South Africa (Ntetha & Mostert 2011:128). MPCCs provide users with access to computers, the internet, fax machines and copy machines. The purpose of MPCCs is to help the poorest and most disadvantaged communities gain access to information and government services. They are considered as one-stop shops through which communities can access government services, information technology and training. Furthermore, granting Under-Serviced Area Licences (USALs) is a further strategy put in place by the government of South Africa to minimise the digital divide (urban-rural area) and to increase affordable universal access. The licensees are Small and Medium Enterprises (SMEs) that provide telecommunication services in areas designed as under-serviced (Farelo & Morris 2006:6).

3.2.3 Challenges of e-government development in South Africa

Although tremendous progresses have been made in South Africa in terms of e-government development, some challenges remain, which include among others:

- ***Human capital***

According to Farelo and Morris (2006:6), South Africa faces human capital development challenges in building the Inclusive Information Society (IIS). One of the key challenges is the shortage of skilled ICT graduates in the country aggravated by the "brain drain" of skilled ICT personnel and other professionals to developed countries (Australia, Germany, etc.) and the turnover from public to private sector. There is a shortage of skilled IT staff in the public sector compared to the private sector in South Africa. According to DPSA (quoted in Kroukamp 2005:56), the ICT literacy levels among public officials and the patterns of access to computers indicate that fewer than twenty percent of public sector functionaries are computer literate. This percentage is likely to be less amongst public officials in the local sphere of government.

Adult literacy which may indirectly reflect levels of computer literacy is estimated at 85.1 percent, but there are vast differences between rural and urban areas. In rural areas the adult literacy rate is less than 80 percent. In addition, limited skills in reading and comprehension of English are limiting a significant number of people of rural areas to utilise e-government services (Kroukamp 2005:61).

- ***Income per capita (GDP per capita)***

Income per capita influences the use of e-government. The 2004 figures estimate the South African per capita income at R14 285 (Kroukamp 2005:62). Taking into consideration that half of the total spending is directed toward food (22%), housing (14%), income tax (9%), and transport (10%), not much is left for ICT-related expenditure (Kroukamp 2005:62). And, because of the depreciation or devaluation of the South African currency, things may become even more difficult on a year-on-year basis.

3.3 E-GOVERNMENT DEVELOPMENT IN RWANDA

Motivation for ICT and e-government in particular, progresses so far made and challenges faced, are discussed in the following section.

3.3.1 Motivation for ICT development

Since 1998 the Government of Rwanda (GoR) had strongly believed that ICT could enable Rwanda to advance the key stages towards industrialisation. The government of Rwanda believed that ICT would help to achieve the Vision 2020 which aims to transform Rwanda into a middle-income country and transition from an agrarian economy to an information-rich and knowledge-based society by 2020. Therefore, the GoR integrated ICTs as a key driver for socio-economic development and to fast track Rwanda's transformation to a knowledge-based society (Ministry of ICT 2013: 5).

In 1998, the Rwandan ICT for Development (ICT4D) policy commonly known as the National Information and Communication Infrastructure Plan (NICI) began with the support of the African Information Society Initiative (AISI) of the United Nations Economic Commission for Africa (UNECA). The process was designed to implement the necessary policies and plans capable of addressing Rwanda's developmental challenges in the information and technology age in order to accelerate the country's socio-economic development process (RITA 2010:6).

The key objectives of NICI were to:

- Transform Rwanda into an IT-literate nation;
- Promote and encourage the deployment and utilisation of ICTs within the society;
- Improve the civil and public service efficiency;
- Improve the information and communication infrastructure;
- Make Rwanda a regional ICT hub;
- Transform the educational system and enhance skills development leveraging ICTs, thereby developing a human resource base that adapts to changing demands of the economy; and
- Develop the legal, institutional and regulatory framework and structures required to support ICT development.

3.3.2 Some of the achievements in the domain of ICT in Rwanda

Rwanda has so far registered progress towards becoming a knowledge-based society and economy since the adoption of its NICI plan in 1998. According to the

Ministry of ICT (2013: 9), the achievements have been registered in the following priority clusters of the country:

3.3.2.1 Economic sector

- ***Private sector:*** ICT initiatives fostering Rwanda's private sector development include several business and career development support services, among others online trade information portals; online tax calculators; online tax declaration and payment; credit reference bureau; land administration and management information system; electronic case management system; online banking and e-transaction regulatory system (RITA 2010: online). These initiatives and many others have greatly improved Rwanda's business environment. For example, in 2010 Rwanda was the top global reformer in the World Bank's "Ease of doing business" ranking moving up from 143rd in 2009 to 67th, the biggest jump ever recorded by any country in the world. The utilisation of ICT has improved Rwanda's business environment since 2010 up to now (2016), whereby the country is ranked 3rd in Africa after Mauritius and South Africa. Online business registration was key to Rwanda's improved ranking in 2011, where it was ranked 58th in the world. Also, in supporting the private sector, publicly funded Business Development Centres (BCDs) were created to support and improve the access to government information and services by the businesses. More than 30 Telecentres or public internet access facilities are operational, but there are still very few in the country compared to the size of the population and level of demand (http://www.minict.gov.rw//ict/documentation).
- ***Agriculture:*** ICT initiatives benefiting the agriculture sector include an online exchange platform, "e-Soko". It is a mobile market information solution that allows farmers and consumers to access market information for agricultural products. In addition, a Land Use Management and Information System (LUMIS) has been implemented to ensure proper usage, planning and management of land in Rwanda (RITA 2010: 21).

3.3.2.2 ICT infrastructure

Rwanda has registered progress in the deployment of ICT infrastructure in order to connect more Rwandans to global networks. The National Fibre Optic Backbone Network that is connecting Rwanda to international sea cables has increased

affordability and access to the internet across the country. A National Data Centre has been developed, which allows Rwanda to centralise its information storage, management and protection.

According to the Rwandan Utilities and Regulatory Authority (2015: online), other achievements are as follows:

- The liberalisation of the telecommunication industry where the situation moved from one telecom operator (MTN) to three competitive telecom operators- MTN, TIGO and Airtel;
- Seven Internet Service Providers (ISPs)- MTN, TIGO, Airtel, Altech Stream, ARTEL, ISPA and Value Data Rwanda;
- Wireless broadband;
- The ICT subscriber base increased significantly: Fixed line (19,000 in 2000 to 39,664 in 2011); mobile telephony user percentage has risen from 4 percent in 2000 to 63 percent in 2013 and to about 75 percent in 2015 (42,000 subscribers in 2000 to 3,548,761 in 2010 and to 6,583,390 subscribers in December 2013 and to about 7.508.215 in 2015);
- Internet users increased from 2 percent to 6 percent in 2010 and from 6 percent to 16 percent in 2013 and to about 37 per cent in 2015 (1.200 internet users in 2000 to 493,900 in 2010 to 1.674.053 in December 2013 and to about 3.659.213 in 2015);
- One laptop per child (more than 200,000 laptops distributed in more than 400 schools);
- High-speed (4GLTE) broadband network. In 2013, South Korea's largest telecom company (Korea Telecom), entered into an agreement valued at $140 million with Rwanda to deploy a high-speed (4GLTE) broadband network across the country. The high-speed (4GLTE) internet connection is now available in the capital city of Kigali and in 10 other cities across the country. This allowed Rwandans to have access to fast, reliable and cheaper internet connection (Tabalo 2014: online); and
- Fibre optic cable of about 2,500 km has been laid across the country connecting all district municipalities and several other public and private institutions in the country. The objective is to provide broadband connectivity to all government institutions and further link them to the National Backbone

for interconnections (Tabalo 2014: online). As a result of interconnections between central government and district municipalities, the video conference system was installed and by now local officials do not have to travel to meetings with central government officials. Meetings are now done through the video conference system. The installed video conference system saves money and time.

3.3.2.3 Education and health sector

- ***Education:*** Rwanda has implemented numerous ICT initiatives including the extensive ICT training for teachers in primary and secondary schools and a policy of One Laptop Per Child in order to transform the delivery and quality of education, particularly in the ICT domain. Science and Technology colleges and scholarships in the ICT domain were increased in order to grow the number of ICT human capital. The Schoolnet project was established and it improved the connectivity and deployment of ICT tools in secondary schools. In February 2014 the government of Rwanda launched the Smart Kigali programme where free Wi-Fi is available in public places such as bus stations, supermarkets, national stadiums, universities and campuses (http://www.africa-ontherise.com/internet-org-partners-with-rwanda).
- **Health sector:** Many e-government projects have been implemented, but the most important project is telemedicine. By means of the installed telemedicine system, King Faisal Hospital (first hospital of the country providing specialised surgical treatment) is connected to district hospitals. The aim is to facilitate the sharing of clinical information between urban and rural hospitals and thereby allowing citizens to receive specialised treatment services remotely without travelling long distances to the capital Kigali.

3.3.2.4 Regulatory framework

To create an environment conducive to ICT deployment and development, several policies and regulations were put in place, among others:

- Enactment of Telecom Law No. 44/2001 of 30/11/2001 as well as Law No. 39/2001 of 13/09/2001 establishing the Rwandan Utilities and Regulatory

Authority (RURA). RURA is a government body in charge of regulation and coordination of ICT-related activities in the country;

- Enactment of Intellectual Property Rights Law No. 31/2009 of 26/10/2009; and
- Enactment of Security Law No. 18/2010 of 12/05/2010 governing electronic messages, electronic signatures, electronic transactions, data protection, cyber security and ICT usage in government administrative procedures (GoR 2014: online).

Despite the registered progresses in the domain of ICT, the journey is still long and many things need to be done.

3.3.3 Challenges for e-government development in Rwanda

Though the government vision was to become an active producer and developer of cutting-edge technology and high value services, Rwanda is still a consumer of ICT goods and services. The internet is mostly accessed by citizens in urban areas and remains beyond the financial capacity of the majority of citizens, particularly those in rural areas who are limited by low disposable incomes. More than 80 percent of Rwandans are engaged in subsistence agriculture and live in rural areas. Between 70 percent and 80 percent of the population speaks only their mother tongue, Kinyarwanda, making internet content in English inaccessible to the majority of Rwandans (Ministry of ICT 2013:online).

Other challenges include:

- ***Electricity:*** Access to electricity and high costs of electricity are major impediments to Rwanda's ICT industry. Rwanda is among African countries with low capital electricity consumption. Only 13 percent of the population had access to electricity in 2010 but this percentage increased to 17 percent in 2013 and to about 27 percent in 2015. However, power outages still remain a big challenge. Because of the large number of people that has to share an insufficient supply of electricity, electricity cut-offs are often experienced in Rwanda (National Institute of Statistics of Rwanda, 2013: 5). The electricity generation cost is high (because of utilisation of generators which consume too much fuel) and the tariffs for power are high at RWF112/kWh for households and RWF 102/kWh for industries,

despite government subsidising the utility. This tariff is three times higher if compared with South Africa. In 2008, the Rwanda Development Board (RDB) conducted a survey on Business Investment Climate (BIC) in Rwanda and 64 percent of businesses surveyed cited access and cost of electricity as a major constraint for their businesses (National Institute of Statistics of Rwanda, 2013:6);

- ***Limited budget:*** Due to limited financial resources of the country, most large ICT projects are financed by donors (either by foreign partner countries or by foreign non-governmental organisations). Dependence on outside donors limits the power and freedom of the government to fully control the project implementation process whereby projects are suspended, changed by donors or take a very long time to be executed and completed;
- ***Low GDP per capita:*** The GDP per capita in Rwanda is relatively very low, it is less than $800 USA dollar per annum. The limited financial capacity of the majority of citizens constrains them to own the necessary ICT devices and to use e-government services;
- ***Limited access to finance for ICT local companies:*** Lending to ICT companies or financing ICT projects is constrained by costs and risks arising from factors such as a lack of collateral and inconsistent skills for assessing and managing risk. Limited lending can also be attributed to Rwanda's low savings rate that currently stands at 8 percent of GDP (RITA 2010: online);
- ***Inadequate international bandwidth:*** Rwanda does not have sufficient international bandwidth. Being landlocked, Rwanda is dependent on neighbouring countries, especially Kenya and Tanzania, for connectivity, which greatly increases connectivity costs. Furthermore, given that ICT is a competitive industry, this dependence could compromise Rwanda's information security as well as business continuity (RITA 2010: online);
- ***Inadequate ICT skills:*** Rwanda still lacks sufficient ICT skilled personnel to drive ICT development. As such, more ICT professionals need to be produced to increase Rwanda's ICT skills base;
- ***Embryonic private sector:*** The private sector, especially in the ICT domain, is relatively small in Rwanda. It is mostly constrained by the access and high cost of electricity, lack of ICT-skilled human capital and low capacity of payment for ICT services by the population;

- ***Low ICT awareness and usage:*** Low level of literacy among the population and, specifically low level of ICT literacy, limit the majority of Rwandans to be aware of available e-government services. In addition, as most of ICT applications and internet content are in foreign languages, a large number of the population, especially those in rural areas, are excluded and cannot benefit from ICT and the internet in particular (RURA 2015);
- ***Inadequate cyber security:*** Rwanda's cyber security needs to be reinforced to mitigate the ever-increasing cyber threats. For instance, 500 million Rwandan francs were stolen from different banks operating in Rwanda via the internet in 2013 (www.newtimes.co.rw). In 2014, 300 million Rwandan francs disappeared because of an outdated electronic financial system utilised by National Bank of Rwanda. Cyber security needs to be improved and awareness needs to be disseminated, while public/private institutional collaboration needs to be strengthened (www.newtimes.co.rw); and
- ***Limited interoperability of government systems:*** Many government systems are still working in isolation from each other, therefore creating duplication and improper usage of resources. In some central government departments and specifically in local spheres of government, most processes are to a large extent paper-based, which increases delays and in turn inefficiency, corruption and misuse of public money. E-government needs to be leveraged to further improve local government operations, thereby improving service delivery to citizens (RURA 2015:online).

3.4 COMPARISON OF E-GOVERNMENT DEVELOPMENT BETWEEN RWANDA AND SOUTH AFRICA

Based on components, such as online service index, telecommunication infrastructure index and human capital index, Table 3.2 indicates the differences in terms of e-government development between the two countries.

Table 3.2: Comparison of ICT and e-government development between Rwanda and South Africa

World Ranking	Country	E-Government Development Index Value (EGDI)	Online Service Index	Telecommunication Infrastructure Index	Human Capital Index
Year 2014					
125	Rwanda	0.3589	0.5118	0.0828	0.4820
93	South Africa	0.4869	0.3858	0.3466	0.7282
The leader in the World	South Korea	0.9462	0.9764	0.9350	0.9273
Year 2012					
140	Rwanda	0.3291	0.3399	0.0614	0.5861
101	South Africa	0.4869	0.4575	0.2214	0.7817
The leader in the World	South Korea	0.9283	1.000	0.8356	0.9494
Year 2010					
148	Rwanda	0.2749	0.0594	0.0067	0.2089
97	South Africa	0.4306	0.1047	0.0476	0.2783
The Leader in the World	South Korea	0.8785	0.3400	0.2109	0.3277

Source: Compiled from UN e-government development survey, 2010, 2012 and 2014.

The data from Table 3.2 show the disparities in terms of ICT and e-government development between Rwanda and South Africa. The disparities are more significant in telecommunication infrastructure and human capital components. However, in 2014 the difference is not so significant in terms of the online service index and e-government development index between the two countries. In addition, the table shows that the two countries are still far behind the Republic of Korea, which is the world leader.

The following data in Table 3.3 show and compare the progress made by the two countries in terms of the world e-government development ranking since 2005.

Table 3.3: Progress made in the world e-government development ranking

Country	E-government Index Value					World e-government Development Ranking					Change in Rank				
	2005	2008	2010	2012	2014	2005	2008	2010	2012	2014	2005	2008	2010	2012	2014
Rwanda	0.2530	0.2941	0.2749	0.3291	0.3589	143	141	148	140	125	-	2 ↑	7 ↓	8 ↑	15 ↑
South Africa	0.5075	0.5115	0.4306	0.4869	0.4869	58	61	97	101	93	-	3 ↓	36 ↓	4 ↓	8 ↑
World average	0.4267	0.4514	0.4406	0.4882	0.4712										

Source: Data compiled from UN e-government development surveys, 2005, 2008, 2010, 2012 and 2014.

Table 3.4: Comparison in terms of number of internet users

Country	Population 2015 (estimates)	Internet users in 2000	Internet users in 2015 (estimates)	Penetration % population	Internet % Africa
Rwanda	12.661.773	5000	3.216.080	25.4%	1%
South Africa	54.777.809	2.400.000	26.841.126	49%	8.6%
Total Africa	1.158.355.663	4.514.400	313.257.074	27%	100%

Source: Central Intelligence Agency (Internet World Stats 2015: online).

As Table 3.3 shows, South Africa has seen a significant regression in its world e-government development ranking if one considers its ranking in 2005. Rwanda has seen a progression in its world e-government development ranking since 2005. However, Rwanda is still below the world average in terms of e-government index value, while South Africa is a little bit above the world average.

The comparison was also made in terms of the percentage of internet users.

According to Table 3.4, the percentage of internet users in South Africa is significantly higher than in Rwanda (49% versus 25.4%). Though the two countries experienced a significant progress in the last 15 years in terms of an increased number of internet users, the increase rate in terms of internet users was higher in Rwanda (from 5000 in 2000 to 3.216.080 users in 2015) than in South Africa (from 2.400.000 in 2000 to 26.841.126 users in 2015). In addition, the table shows that if one considers the total number of internet users in Africa, South Africa represents 8.6% of the total internet users in Africa while Rwanda represents only 1%.

3.5 DEVELOPMENTAL ROLE OF LOCAL GOVERNMENT

The government has the responsibility to ensure that available resources are adequately used in the interest of citizens. In this regard, the Constitution, 1996 compels government to utilise its available resources, to ensure that all citizens of South Africa have access to public services, such as health care, housing, water, electricity, adequate education and social security.

The local spheres of government are at the centre of development and the well-being of citizens as they translate the national priorities into achievable goals for all citizens (Chetty 2015:223). According to Mkhonta (2007:25), municipalities are the custodians of public funds. They are tasked with using public funds to respond to the needs of the communities they serve. Chetty (2015:223) further states that in today's society, citizens cannot tolerate poor services in return for their money paid to government through taxes. They therefore want effective service delivery carried out with speed and correctness. In order to address the increasing and changing needs and expectations of citizens, local spheres of government need to be developmental.

According to Planact (2001:12), a municipality which is developmental is one that ensures the following aspects:

- All communities have access to basic services or infrastructure;
- Every citizen without any discrimination can participate in decision-making and planning;
- The local economy grows;
- Job opportunities increase; and
- Local resources are used wisely to improve the quality of life for everyone, now and in the future.

Developmental local government is always committed to finding sustainable ways to meet the social and economic needs of citizens in order to improve the quality of their lives. According to Crous (2004:36), there are three desired outcomes that any developmental local government seeks to achieve: provision of household infrastructure and services; creation of liveable and integrated areas; and local economic development.

The achievement of the aforementioned developmental outcomes requires significant changes in the way local government works, communicates and cooperates with citizens and businesses. Changes are also needed in the way local government communicates and collaborates with national and provincial government, and finally the way different units or services within the municipality communicate and collaborate. Therefore, the effective utilisation of ICT by local government would help to achieve these changes

According to Mello (2007:21), the following three interrelated approaches can assist municipalities to become developmental:

- ***Integrated Development Plan (IDP)***. IDP is a process through which a municipality can establish a development plan for the short, medium and long term. This process involves all stakeholders in the activities of the municipalities;
- ***Performance management***. Performance management aims at improving the effectiveness and efficiency of local government by helping municipalities to focus on strategic priorities and measuring results, and improving municipal accountability to local citizens; and

- ***Working together with local citizens***. One of the objects of local government is to provide democratic and accountable government for each community and to encourage the involvement of communities and community organisations in affairs of local government. Developmental local government implies strong leadership, clear and long-term vision, maximum participation by the community, private sector and all stakeholders in order to meet the basic needs of all and to build solid foundations for growth and lasting prosperity.

Though Mello and the White Paper on Local Government, 1998 did not mention the use of ICT among the approaches which can assist local government to become more developmental, the researcher argues that in today's era of the information and knowledge society the use of ICT is the *sine qua non* for the local sphere of government to become developmental. Nowadays no one can ignore the role ICT can play in streamlining local government, to accelerate the social and economic development and to enhance service delivery to citizens. Furthermore, the use of ICT by the local sphere of government is today one of the approaches to enhance accountability, transparency, efficiency and active community involvement in the decision-making process.

Objectives of local government

According to Mkhonta (2007:12), government and public institutions exist primarily and above all else to serve citizens in order to meet their needs as well as make their lives better. Enhancing the quality of service delivery has become a major objective of modern local spheres of government.

In countries such as Rwanda and South Africa, with more than one sphere of government, local government plays a critical role in terms of service delivery. As the sphere of government which is closest to the people, a municipality's main objective is to complement the activities of national government by performing functions that help to enhance service delivery. Local government is a canal through which central government ensures that services are provided and citizens are satisfied. In this regard, Mello (2007:22) argues that citizens' expectations are increasing day by day. Today, local citizens expect local government to see to it that local roads are built and maintained efficiently; streets are clean and safe; refuse is collected timeously,

limited resources are managed judiciously and a wide range of other services are delivered competently in order for citizens to receive good value for money.

According to Planact (2001:9), local government in South Africa must strive, within its financial and administrative capacity, to fulfil the following objectives:

- To provide democratic and accountable government for local communities;
- To ensure sustainable provision of services to communities;
- To promote social and economic development;
- To promote a safe and healthy environment; and
- To encourage the involvement of communities in the affairs of local government.

The above objectives assigned to the local sphere of government are not only specific to local government in South Africa, but the same objectives are assigned to local spheres of government in Rwanda as well. However, because of the 1994 genocide in Rwanda against the Tutsis, another major objective is to promote unity and reconciliation among Rwandans, and this is assigned to the local sphere of government in Rwanda. In their different activities, municipalities must strive to promote unity and reconciliation among Rwandans.

3.6 SUMMARY

Government and its public institutions exist primarily and above all else to serve citizens in order to meet their needs as well as make their lives better. Enhancing the quality of service delivery has become a major objective of modern local governments. After 1994 (post-genocide period against the Tutsis in Rwanda, and the period of post-Apartheid in South Africa) the two countries had almost the same priorities, namely to accelerate socio-economic development, modernise public administrations and enhance public service delivery to the citizens. To achieve these objectives and other priorities, the utilisation of ICT was imperative.

ICT was seen and considered as an enabling tool to accelerate socio-economic development, to promote citizen participation in decision-making and to enhance inclusive public service delivery. The motivations behind the utilisation of e-government were, amongst others, to improve the efficiency and quality of government services; to ensure that government services are delivered to all levels

of society anytime and anywhere; to consolidate transparency and accountability in the delivery of government services; to enhance citizens' participation in decision-making; and to transform the society into an information society. For the successful implementation of e-government, a favourable environment was created whereby ICT policies were elaborated and put in place, government bodies or agencies in charge of implementation and coordination were created, and ICT infrastructure was put in place.

Though many positive changes and progress have been achieved, many challenges remain and need to be overcome. The digital divide between urban and rural citizens; low ICT literacy, low GDP per capita; and low access to electricity, especially in Rwanda, are the major challenges for e-government development in both Rwanda and South Africa.

In countries, such Rwanda and South Africa, the local sphere of government plays a critical role in terms of service delivery. It is the custodian of public funds and therefore it is tasked to use public funds to respond to the needs of the communities. To be able to better serve the community, a local government needs to be developmental. In today's era, the effective utilisation of ICT by the local sphere of government is a *sine qua non* for local government to be developmental and thus, be able to deliver public services in an effective and efficient manner.

Chapter 4 discusses the theoretical framework for better understanding the adoption of innovation by citizens. It helps to understand the factors that may negatively or positively affect the utilisation of e-government either by municipalities or by citizens.

CHAPTER 4: THEORETICAL FRAMEWORK FOR THE USE OF E-GOVERNMENT SERVICES

"To get the bad customs of a country changed and new ones, though better, introduced, it is necessary first to remove the prejudices of the people, enlighten their ignorance, and convince them that their interests will be promoted by the proposed changes; and this is not the work of a day".
(Benjamin Franklin 1781)

4.1 INTRODUCTION

The provision of government services and information to members of the public (citizens and businesses) has traditionally been through face-to-face interaction and the user of government services was obliged to physically visit government offices. Today, however, developments in ICTs have brought about many changes in the way governments worldwide are able to provide government services and information to citizens. Many countries in Africa, including South Africa and Rwanda, have now adopted the use of e-government as one of the main delivery channels for public services and information. Unlike traditional ways of delivering public services and information, the use of e-government is associated with many benefits from the providers' and the users' perspectives (the benefits of the use of e-government were depicted in Chapter 2). However, there are many challenges with regard to the adoption and use of e-government by the providers (the local sphere of government in the context of this study) and the potential users (citizens) in particular.

Though the success of e-government depends upon many factors, such as the willingness, commitment and support of top political leadership, the availability of funds and sufficient IT staff, it is principally dependent on citizens' willingness to accept and use those e-government services provided by public institutions. In this context, Alawadhi and Morris (2008:2) argue that e-government initiative provides no benefit if the intended users fail to use it. In addition, Belanger and Carter (2005:12), Moon and Norris (2005:51) and Sahin (2006:16) all argue that one of the most important factors for the success of e-government services is citizens' acceptance and use of e-government services.

The core objective of this chapter is for the researcher to gain a better understanding of the factors that would promote or hinder the use of an innovation, specifically e-

government. An assessment of the utilisation of e-government can only be successful if one understands the factors that may influence or impede adoption. A number of models and theories on technology acceptance were studied by the researcher in order to gain a better understanding of the factors that would determine citizens' adoption of e-government services. However, only two technology models are discussed in this chapter. The study adapted the Diffusion of Innovations (DoI) model as the best model to investigate the factors that would facilitate or hinder the adoption and use of e-government by the selected district municipalities. The first section of the chapter provides an overview of one of the dominant models of technology acceptance "Rogers' Theory of Diffusion of Innovations". The second section discusses the second technology model (Unified Theory of Acceptance and Use of Technology [UTAUT]) for further understanding of the factors which would determine the utilisation of e-government. The third section discusses findings from previous empirical studies of the factors which influence the utilisation of e-government. Lastly, the chapter presents the research model to assess the utilisation of e-government by the selected district municipalities.

4.2 ROGERS' DIFFUSION OF INNOVATIONS MODEL

A number of technology models have been developed over the years to explain the factors that promote or hinder the acceptance and use of technology by members of society. The most cited and known technology models are: Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1980); Theory of Planned Behaviour (TPB) developed by Ajzen (1985); Technology Acceptance Model (TAM) by Davis, (1989); Model of PC Utilisation (MPCU) by Thompson et al. (1991); Extension of the Technology Acceptance Model (TAM2) by Venkatesh and Davis (2000); Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris and Davis (2003); and Diffusion of Innovation Model (DoI) by Everett Rogers (2003). Though several researchers preceded him, Everett Rogers' diffusion of innovations was viewed as the most influential model (Mpehle 2012:115).

4.2.1 Notion of innovation and diffusion of an innovation

According to Rogers (2003:12), an innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption. An innovation may have been invented a long time ago, but if individuals in a social system perceive it as

new, then it may still be an innovation for them (Sahin 2006:14). In this context, it can be argued that though the internet has been discovered and used over the years in the developed countries, it is still perceived as an innovation in most of the developing countries, especially sub-Saharan Africa. And within the country (for instance in Rwanda), the internet might be perceived as an innovation in rural areas, while it is not perceived as new in urban areas. Also, it might be perceived as an innovation by a certain group of people (for example, the black community in the townships while it is not new for another group of people. Factors such as level of education, level of income, geographical location, age and gender might play a role. These factors, or differences, could even exist within one household, where the parents, for instance, are illiterate, but the children finished high school or even obtained a degree, and they could influence the perceptions of other members of the household.

Diffusion of an innovation is defined as the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers 2003:11). According to Ton and Spil (2006:2), diffusion is a special type of communication concerned with the spread of messages that are perceived as new ideas. Technological innovations such as e-government for example, are not always diffused and adopted easily and rapidly, because of a kind of uncertainty created by a technological innovation in the minds of citizens. They are rarely very certain that an innovation (for instance e-government) represents a superior alternative or advantage to the previous practice (face-to-face contact or physical visits to government offices) that it might replace. The main questions that an individual often asks in regard to an innovation, like e-government are: “What is e-government?” “How does it work?” “Why does it work?” and “What will its advantages and disadvantages be in my situation?” Therefore, for diffusion of an innovation to be successful a particular type of communication is needed whereby the information about an innovation is regularly exchanged among the members of the society.

4.2.2 The innovation-decision process

One of the findings of Rogers’s literature review was what he called the innovation-decision process (Rogers 2003:14). The process describes the steps an entity goes

through in deciding whether to adopt an innovation. The entity involved may be an individual, a community or a company. For the purpose of this research, the discussion of the innovation-decision process will focus on e-government. According to Rogers's theory of diffusion of innovation (Rogers, 1995:11), the innovation-decision process involves five stages: (i) knowledge or awareness; (ii) persuasion; (iii) decision; (iv) implementation; and (v) confirmation. These stages follow each other in a time-ordered manner. An individual or an entity passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to the implementation of a new idea, and to confirmation of the adoption decision. Furthermore, Martin and Cormack (in Sahin 2006:16) have added the sixth stage which is the discontinuance stage. Five stages of the innovation-decision process are discussed in the following paragraphs:

The knowledge stage

According to Rogers (2003:20), the innovation-decision process starts first and foremost with the knowledge stage. It is difficult for an individual to adopt a technological innovation that he or she is not aware of. At this stage, an individual first learns about the existence of an innovation and seeks information about the innovation. "What? " "How?" and "Why?" are the critical questions asked in the knowledge phase. As far as e-government is concerned, the citizen will attempt to determine what e-government service is and how and why it works before he or she comes to a decision to use it. In addition, Rogers (2003:21) argues that the questions (What? How? and Why?) form the following three types of knowledge which are the pre-conditions for an individual to decide to adopt an innovation:

- ***Awareness-knowledge:*** Awareness-knowledge represents the knowledge of the existence of a technological innovation. The knowledge about the existence of an innovation can motivate the individual to learn more about the innovation and, eventually, to adopt it. When an individual has acquired awareness-knowledge, he or she may develop a need to learn about two other types of knowledge.
- ***How-to-knowledge:*** How-to-knowledge contains information about how to use an innovation correctly (Rogers 2003:22). According to Sahin (2006:16), how-to-knowledge is an essential variable in the innovation-decision process. The adoption chances of an innovation are increased when individuals have a sufficient level of how-to-knowledge. For example, Alawadhi and Morris (2008:8)

found in their research that people with greater internet experience better realise the benefits they get from using the internet and can relate such benefits to the use of e-government services. Therefore, e-government is more likely to be used by experienced internet users.

As far as how-to-knowledge is concerned, the researcher argues that a district municipality might have ICT tools such as computers with updated software, full internet connection, printers, scanner and photocopy machines, video camera, video conference rooms, etc. However, these ICT tools might not be used at an expected level to serve citizens better because of an insufficient level of how-to-knowledge of the staff. Again, district municipalities might have created and put in place the MPCCs in the townships, but those MPCCs might not be used sufficiently because citizens do not have an adequate level of how-to-knowledge. Therefore, the presence of ICT tools in the district municipality is not enough if the district officials, employees and citizens in general do not have a sufficient level of how-to-knowledge.

- ***Principles-knowledge:*** Principles-knowledge includes the functioning principles describing how and why an innovation works. An innovation can be adopted without this knowledge, but the misuse of the innovation may cause its discontinuance (Sahin 2006:16). In this perspective, the researcher might argue that because of an insufficient level of principles-knowledge, the acquired ICT tools in the district municipalities' offices might be misused and serve another purpose because district municipalities lack a global vision of how and why to integrate technology into the service delivery process. That is, the purchased ICT tools could be used for personal interest rather than for community interest because the principles-knowledge of e-government is lacking among municipality officials.

From the innovation-decision process point of view, the researcher might argue that the adoption and utilisation of e-government by the staff of the district municipality requires them to have maximum awareness-knowledge, how-to-knowledge and principles-knowledge about e-government. According to Sahin (2006:17), the principles-knowledge (know-why-knowledge) appears to be important for the staff, because an employee may have all the necessary knowledge about e-government,

but he or she may not use e-government correctly because of a negative attitude toward this innovation. A know-why knowledge and experience are necessary because they shape the employee's attitudes, and the employee's attitudes shape the adoption of e-government. In the same perspective, the adoption and use of e-government requires that citizens should have a minimum of awareness-knowledge, how-to-knowledge and principles-knowledge. In this context, Parent (in Shareef *et al*. 2010:89) argues that when citizens are aware of the political agenda of e-government, the expected quality of service from its implementation and the competitive advantages of e-government, citizens might then have an intention to adopt e-government services.

The persuasion stage

The persuasion stage follows the knowledge stage in the innovation-decision process. After a person has become aware of an innovation, he or she moves into the persuasion stage. He or she begins to show interest in the innovation and seeks out additional information about the innovation: costs, features, etc. He or she starts shaping his or her attitude (favourable or unfavourable) toward the innovation (Sahin, 2006:10). Furthermore, Rogers (2003:20) states that while the knowledge stage is more cognitive (knowing) centred, the persuasion stage is more effective (feeling) centred. Therefore, at this stage the social reinforcement from others (colleagues, peers, etc.) affect the individual's opinions and beliefs about the innovation. In this context, the researcher might argue that the experience and habit of senior managers in the use of e-government and their favourable opinions towards e-government are persuading facts for the adoption and use of e-government by other staff members in a municipality. In this perspective, Rogers (2003:30) argues that generally the fastest rate of adoption of innovations results from authority examples and decisions. However, it all depends on how innovative the authorities are.

In addition, favourable opinions and testimonies toward e-government from peer colleagues, neighbours, especially opinion leaders in the community, are persuading facts for the adoption and use of e-government services by common citizens. The persuasion power of opinion leaders was stressed by Moon (2002:428). For Moon (2002:428), when well-informed opinion leaders communicate their approval of an innovation to the members of the society, the majority respond by rapidly adopting

them. Moon (2002:431) further stresses that, since opinion leaders directly affect the tipping of an innovation, a powerful way for change agents to affect the diffusion of an innovation (e-government for instance) is to identify opinion leaders in the community and to affect their attitudes. Persuading opinion leaders and gaining their positive attitudes toward an innovation is the easiest way to foment positive attitudes toward an innovation among citizens. Opinion leaders are most trusted and have greater effectiveness in dealing with resistance or apathy on the part of the citizen (Moon 2002:432).

The decision stage

At this stage, an individual (or other decision-making unit) engages in activities that lead to a choice to adopt or reject an innovation. An individual seeks innovation-evaluation information in order to reduce uncertainty about an innovation's expected consequences. At this stage an individual starts weighing the innovation's advantages and disadvantages in his or her own situation. From his or her personal innovation-evaluation process, an individual will come to a decision whether to adopt an innovation or to reject it. If he finds that the innovation offers more advantages than disadvantages in his or her own situation, he or she will adopt an innovation and will start using it and integrating it into his or her daily life (Sahin 2006:17).

As far as the decision to utilise e-government is concerned, the researcher argues that the mass media can play a big role in influencing and motivating citizens to take a decision to use e-government services. The mass media channels are most appropriate for mass and rapid sensitisation about e-government and its benefits. The mass media channels can probably eliminate all kinds of uncertainty about e-government and then influence citizens to adopt and use e-government services. In supporting this point of view, Anon (2013) states that mass media can play a powerful role in the diffusion of an innovation because it rapidly spreads knowledge of innovations to a large audience. Mass media can play a significant role in the diffusion process of e-government, especially during the knowledge or awareness phase, persuasion phase and decision phase. However, interpersonal communication between citizens, peers and opinion leaders is most significant during the decision phase.

The implementation stage

An innovation is put into practice at the implementation stage. The innovation is regularly evaluated by the user to see if it meets expectations (Rogers 2003:11). By using the innovation an individual may be confronted with new information and realities. Uncertainty about the usability and usefulness of an innovation can create problems at this stage. Therefore, the user needs technical assistance from change agents and others to reduce the degree of uncertainty about innovation. The absence of technical support and advice may cause the user to end the use of an innovation (Rogers 2003:12).

As far as the utilisation of e-government services is concerned, the researcher argues that district municipalities should have enough skilled IT technicians readily available to give technical support and advice to users (citizens and businesses) who need them. In addition, district municipalities should ensure that the system of e-government put in place meets the expectations of users. The system should be regularly monitored and adjusted to meet the dynamic changes in the technological domain and the changing needs of users. Otherwise, uncertainty about the usability and usefulness of e-government will likely limit the utilisation of e-government by the district municipality's staff members and citizens.

The confirmation stage

At this stage, an individual finalises his or her decision regarding the adoption of an innovation. One option is the full adoption and another is a reversal of the original choice to use the innovation (Sahin 2006:17). For the full adoption, an individual needs to see the system or an innovation supportive in his or her situation. In this context the researcher might argue that if the users (citizens, businesses) do not find online government services and information they are expecting to find on the district municipality's website or if they are not assisted in accordance with their expectations, they may stop using e-government services and go back to their traditional ways (face-to- face interaction or physical visit of government offices). In this regard, Moon and Norris (2005:49) argue that the majority of e-government projects in Africa have failed totally or partially because they did not provide the relative advantages expected by the users (citizens and businesses). And because citizens failed to have their needs met through the use of e-government services they terminated its use. Therefore, online customer care and the relevant online

information and services available on the district municipality's website are the significant factors for the successful utilisation of e-government services by citizens and businesses.

While the innovation-decision process explains how an innovation is adopted or rejected, it does not, however, explain why one technology may be adopted over another. To fill this gap, Rogers (2003:15) proposes five attributes of an innovation that determine its rate of adoption.

4.2.3 Attributes of an innovation

According to Rogers's theory of diffusion of innovations (1995:36-42), an innovation which has five attributes (relative advantage, compatibility, complexity, trialability and observability) will be adopted more rapidly than other innovations. In addition to these five perceived attributes of an innovation, Rogers (2003) provides other factors which may also determine the rate of adoption: (i) the type of innovation-decision (ii) nature of communication channels diffusing the innovation at various stages in the innovation-decision process; (iii) the nature of the social system in which the innovation is diffusing and (iv) the extent of change agents' promotion efforts and top leadership commitment in diffusing the innovation. Five attributes of an innovation which determine its adoption are discussed below:

Relative advantage

According to Rogers (2003:212), relative advantage is defined as the degree to which an innovation is perceived as being better than the idea it supersedes. Potential users want to know the degree to which a new idea or a new practice is better than an existing practice. Diffusion scholars have found relative advantage to be one of the best predictors of an innovation's rate of adoption (Chuttur, 2009:38). Relative advantage indicates the benefits and the costs resulting from the adoption of an innovation. The sub-dimensions of relative advantage include the degree of economic profitability, low initial cost, decrease in discomfort, social prestige and savings in time and effort (Rogers 2003:216).

In addition, Sahin (2006:18) argues that it does not matter how much designers of an innovation and IT specialists defend and talk about the innovation, but what does matter is whether an individual perceives an innovation as advantageous. The degree to which an individual believes that using a particular system would enhance

his or her job performance can directly affect the intentions to adopt or not to adopt an innovation. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be. For the purpose of the research, the researcher argues that the rate of adoption and utilisation of e-government services by citizens is determined by their perception of the relative advantages of e-government services. Again, the utilisation of e-government by citizens will depend upon the perceived relative advantage of e-government over the traditional ways of service delivery. If relative benefits of e-government (for instance, availability of government information and services on a 24/7 basis, accessibility from anywhere, comfort in use, time savings and cost savings) are totally perceived by citizens, the new system will take over the old system.

Compatibility

Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, needs and practices (Rogers, 2003:15). An innovation that is more compatible is less uncertain to the potential user, and fits in more closely with the individual's life situation. An innovation can be compatible or incompatible with socio-cultural values and beliefs, with previously introduced practice, or with client needs for the innovation (Moon & Norris 2005:49).

- *Compatibility with values and beliefs*

According to Moon and Norris (2005:51), an innovation's incompatibility with cultural values and beliefs can block its adoption. As far as compatibility with values and the use of e-government are concerned, the following question can be asked: "Are there some values and beliefs by people in South Africa and Rwanda which might hinder the adoption and use of e-government?" Some values and beliefs in Rwanda for instance, such as keeping secrets in the heart (not to divulge information and openly express feelings), being shy to share information with others, a low-level culture of open expression and participation because of political background, might directly or indirectly affect the adoption and use of e-government. In addition, the full adoption and use of e-government might be hindered by a socio-political system where democratic principles such as freedom of speech, freedom of expression and participation of citizens in the decision-making process are restricted and controlled. For instance, some dictatorship regimes in Africa were unsuccessful in the implementation of e-government and e-participation in particular.

- *Compatibility with previously introduced ideas*

The adoption of an innovation not only requires being compatible with values and beliefs but also with previously adopted ideas. The compatibility of an innovation with a preceding idea or practice can either speed up or retard its rate of adoption. Old ideas are the main mental tools that individuals utilise to assess new ideas. Previous practice provides a familiar standard against which an innovation can be interpreted, thus decreasing uncertainty. That is, the rate of adoption of a new practice is affected by the old practice that it supersedes (Rogers 2003:226). In this context, e-government as a new system of public service delivery might be hindered by those officials and citizens who hold onto traditional ways of public service delivery, and then resist the new system (e-government). Resistance to a new idea or system is a concern especially in the case of people with a low level of education. Walter Bagehot (1873) said: "*One of the greatest pains to human nature is the pain of a new idea. It makes you think that after all, your favorite notions may be wrong, your firmest beliefs ill-founded. Naturally, therefore, common men hate a new idea, and are disposed more or less to ill-treat the original man who brings it*". This argument was also used by Machiavelli (1513) who said: "*There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new order of things*".

- *Compatibility with needs*

One dimension of the compatibility of an innovation is the degree to which it meets a felt need. When felt needs are met, a faster rate of adoption usually occurs. Change agents should determine the needs of their clients, and then recommend innovations that fulfil these needs (Rogers 2003:228). Discovering felt needs is not a simple matter, therefore policy makers must have a high degree of empathy and rapport with their citizens in order to assess their needs accurately (Anon 2013). One of the causes of partial or total failure of e-government projects in developing countries is that e-government systems and software are designed by outside IT professionals (from Europe or America) who might not know the felt needs of citizens. And, because those outside designed e-government systems and software do not meet the felt and real needs of local citizens, they end up not being used by the citizens. In this context, the researcher might argue that policy makers and IT professionals in our countries should understand this reality that Americans are not like Rwandans

and South Africans and that Kigali and Mangaung are not New York, and that the concept of “one size fits all” does not always work when it comes to e-government. E-government systems should be designed according to local realities and to meet the needs of local citizens. Continuous monitoring and adaptation should be done in this regard.

Complexity

Complexity is the degree to which an innovation is perceived as relatively difficult to understand and to use (Rogers 2003:242). The more an innovation is complicated to learn and to use, the lower the rate of adoption. According to Chuttur (2009:15), the degree to which an individual believes that using a particular innovation would be free of physical and mental effort can directly affect his or her decision to adopt or not to adopt a particular innovation. In this context, the researcher argues that the rate of adoption and the use of e-government could increase if hardware and software required for the utilisation of e-government are user-friendly and customer-oriented. In addition, the adoption and the use of e-government services could increase if e-government websites of the district municipalities are designed in such a way that all categories of citizens (in terms of disability, age, education level and profession) are able to visit and use them. A multilingual option is very important, especially in South Africa, when an e-government platform is designed, given the fact that South Africa has 11 official languages (section 6(1) of the Constitution, 1996).

Trialability

Trialability is the degree to which an innovation may be experimented with on a limited basis (Rogers 2003:243). The more an innovation can be tried, the faster would be its adoption (Sahin 2006:19). As far as trialability and the adoption and use of e-government are concerned, the researcher argues that putting in place many MPCCs in the townships where citizens have easy access, and charging users of MPCCs small fees could encourage citizens to experiment with e-government and then promote its adoption and use.

Observability

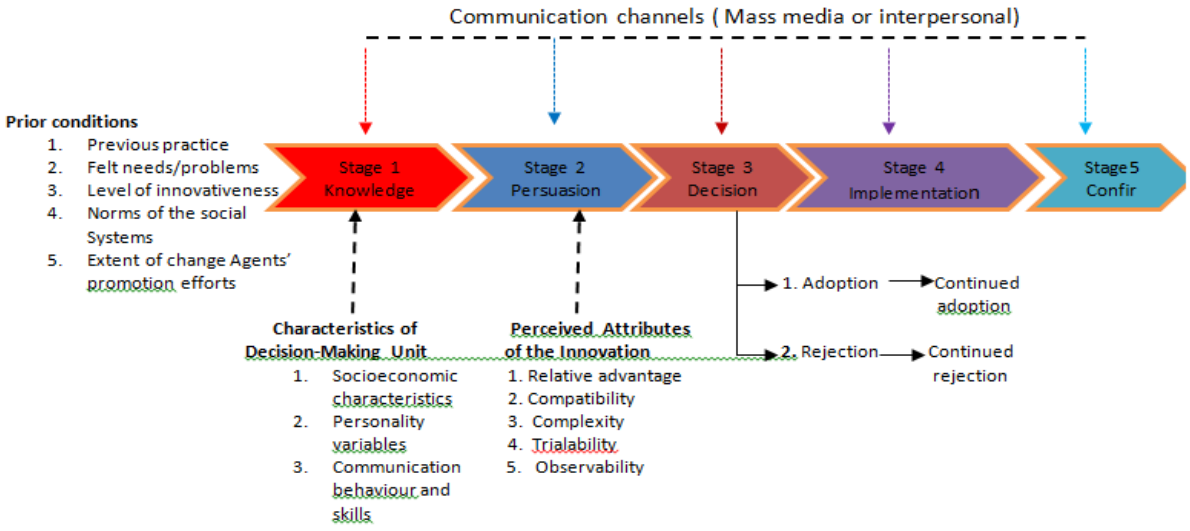
Observability is the extent to which the results or outputs of an innovation are visible to others (Rogers 2003:244). If an individual can adopt and use an innovation and

the results or outputs from that adoption are easily seen by other members of the community, that innovation is likely to be adopted. Such visibility stimulates curiosity and discussion about an innovation. Friends and neighbours are the first to be interested and are then likely to adopt an innovation. As far as observability and the utilisation of e-government are concerned, the researcher argues that study visits to the benchmark district municipalities (the best performers inside or outside the country) in terms of the utilisation of e-government could help the selected district municipalities to hear and observe what others are doing, how they are doing it and subsequent to those well-organised study visits, the selected district municipalities can be inspired to improve the utilisation of e-government (best practices sharing).

In conclusion, Rogers in his theory of diffusion of innovations (2003:243), states that an innovation which is perceived by the potential users as: (i) useful or relatively advantageous in their situation; (ii) compatible with their values and needs; (iii) easier to learn and to use; (iv) which can be experimented; and (v) observable, is adopted more rapidly than other innovations.

Figure 4.1 below depicts the above explanation of innovation-decision process and attributes of an innovation which affect its adoption.

Figure 4.1: Diffusion of innovations model



Source: Adapted from Rogers (2003: 43).

For further understanding of the factors which might influence the adoption and use of e-government, the Unified Theory of Acceptance and Use of Technology is presented and discussed in the following sections.

4.3 UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

The Diffusion of Innovation (DoI) model described earlier is not the only existing model to describe the factors that are influencing the adoption of an innovation. Other models have been developed over the years to discover the factors which can influence the adoption of an innovation. One of the latest developments in the field of technology acceptance models is the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh, Morris and Davis (2003:425-456). Like Rogers's theory of Diffusion of Innovations, UTAUT also provides the factors which can influence the intentions to use an innovation such as e-government. The factors in UTAUT are somewhat similar to those described in DoI, but an additional factor, namely "facilitating conditions", is a very critical factor that can influence the adoption of e-government by district municipalities.

According to Venkatesh *et al*. (2003:453), four key factors, namely performance expectancy, effort expectancy, social influence and facilitating conditions are direct determinants of the intention to adopt and use an innovation (e-government for instance). The variables of gender, age, experience and voluntariness of use all work to moderate the impact of those four constructs. The four determinants are discussed below:

Performance expectancy

It is the degree to which an individual believes that using the system will help him or her to perform better and to enhance his or her job performance. For example, a person's belief that in engaging in physical activity will lead to a certain outcome (like losing weight) is his outcome expectation. Expectations can be based on past observations and experiences, information received from the media or other sources, or simply personal beliefs (Norman 2010:31). This factor is similar to what was described and termed as "Relative advantage" in the DoI model (Rogers 2003:212) and "Usefulness" in the Technology Acceptance Model (TAM) by Davis (1989:319-325).

In the context of this study, performance expectancy can be measured by the perceptions or beliefs of citizens that using e-government services would help them in terms of saving time, money and effort, facilitating communication and interaction with government officials, improving the quality of service delivery, eliminating favouritism and corruption in service delivery, among others. Therefore, the researcher argues that expectations about e-government would determine the citizens' choice whether or not to use it. If the users (citizens) perceive the e-government system as less beneficial in their situation or not beneficial at all, they will not adopt and use it.

Effort expectancy

Effort expectancy is the degree to which an individual believes that using a particular technological innovation would be free of effort (degree of ease associated with the use of the system). The effort expectancy is similar to what was termed "Complexity" in DoI model (Rogers 2003:242) and "Ease of use" in TAM (Davis 1989:322). In the context of this study, effort expectancy can be measured by the perceptions or beliefs of citizens that it is easy to learn how to use e-government, and is therefore easy to use. In this perspective, the researcher argues that unless e-government services are designed in such a way that all categories of citizens can easily learn how to use it, e-government services will not be adopted and used. In addition, Alshawi and Alalwany (2009:200) argue that the adoption and use of e-government by citizens is determined by the degree to which citizens believe that using the e-government system does not require effort. Perceived ease of use contributes to perceived usefulness, because the easier a system is to use, the more useful it is perceived to be.

Social influence

Social influence is the degree to which an individual perceives that important people known to him or her (peers, neighbours, friends, family relatives) believe that he or she should use the new system. For example, a person may use an innovation only because he or she wants to avoid criticism from peers. The social influence factor is similar to what was described and termed as "Subjective norms" in Theory of Planned Behaviour (TPB) by Ajzen and Fishbein (1980:64).

As far as social influence and the adoption of e-government are concerned, the researcher argues that the role and influence of opinion leaders in the community should not be ignored in the diffusion of the e-government process. The persuasion of opinion leaders to use e-government services would influence others in the community. Opinion leaders can be officials and employees in local government and other influential people within the community. Also, the persuasion of educated young generations to use e-government services would influence older people in the community.

Facilitating conditions

Facilitating conditions are the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system (Alshehri & Drew 2012:13). In the context of this study, facilitating conditions can be measured by the perceptions or beliefs of citizens that they have access to required resources or tools and that they have all the necessary support needed to use e-government services. Therefore, the researcher argues that the use of e-government by district municipalities depends among other things on the availability of required resources (funds, ICT tools, IT staff), and the necessary support (training for instance) in using e-government. Facilitating conditions for citizens can be: easy access to computers; easy access to internet connections; access to electricity; access to IT technicians; and the necessary support, for instance regular training sessions in the use of new ICT.

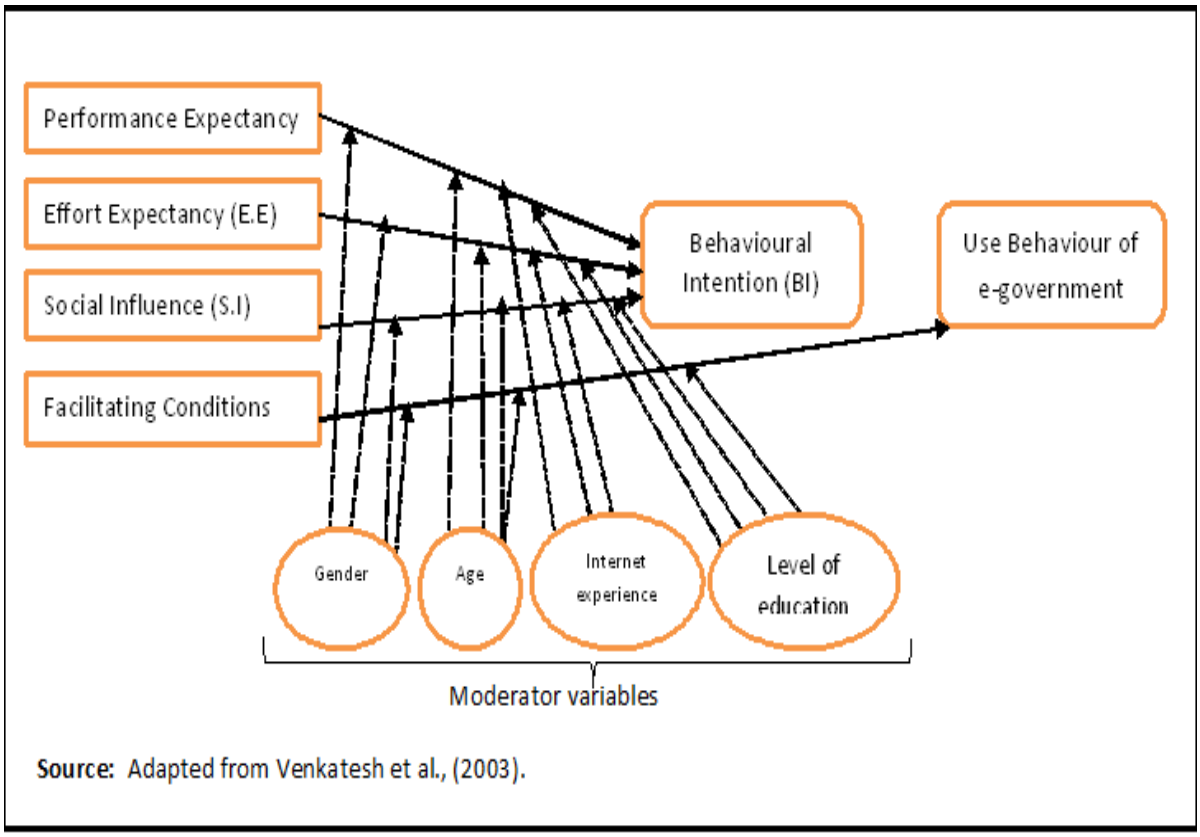
Furthermore, though variables such as gender, age, experience and level of education were considered as moderators of four factors (performance expectancy; effort expectancy; social influence; and facilitating conditions) they have, however, significant meaning in this study. In this regard, the researcher argues that the traditional gender role and gender bias both in South African and in Rwandan society created barriers for females to have easy access to education and to sources of revenue. Because of tradition, especially in the black community, the role attributed to females was and is still basically perceived as having children and staying at home to take care of the family. Females have limited access to activities that generate revenue as compared to males. Therefore, there is a notion that females are less likely than males to buy a computer or laptop. Females are less likely to

have easy access to resources required to use new ICTs than males. Finally, it may be said that females are less likely to use e- government services than males.

With regard to the level of education, the researcher argues that education considerably influences the use of e-government services by citizens in district municipalities. Generally, the more the level of education increases, the more the interest in the use of ICTs increases, particularly the internet. Therefore, online services available on the district municipality's website are more likely to be used by educated people and most likely by experienced internet users. As regards age, the researcher argues that young people are open to accept changes more easily and quickly than old people. Therefore, e-government as an innovation is more likely to be accepted and used by young people than old ones.

The factors discussed above which influence the adoption and use of e-government are depicted in Figure 4.2.

Figure 4.2: Determinant factors of adoption of an innovation



Source: Adapted from Venkatesh et al., (2003).

4.4 OTHER FACTORS INFLUENCING THE ADOPTION AND USAGE OF E-GOVERNMENT SERVICES

The theories and models discussed earlier provided the factors which can promote and hinder the use of an innovation in general. This section presents some of the specific determining factors for the adoption of e-government services. Shareef *et al*. (2010:80-82) provide the factors necessary for citizens and businesses to adopt e-government services.

Digital literacy or computer self-efficacy

Digital literacy refers to an individual's ability to use ICTs, such as computers, telephones, tablets, cellphones, among others; to effectively and efficiently communicate and interact with people not only in a social environment, but also in learning and work environments (Shareef *et al*. 2010:80). Computer literacy is also about the ability to use ICT to generate, capture and disseminate data (Mpehle 2012:110). According to Alawadhi and Morris (2008:24), a person will not arrive at the intention to use an e-government system which requires computer knowledge and skills unless that person has competence due to experience in the use of ICTs. Furthermore, Sahin (2006:15) argues that failing to get hands-on experience in new technology will not make a user's attitude favourable to adopting the system. In the absence of computer knowledge, a user (citizen) cannot perceive the economic advantages of e-government services. As citizens were used to traditional government services which were paper-based and did not require computer skills, the use of e-government, which is computer and internet based, now requires computer availability and computer skills. Therefore, computer self-efficacy is an important predictor of whether a user (citizen, business and public official.) will adopt e-government services instead of using traditional ways of public service delivery.

Availability of resources

According to the Capability Theory (in Mpehle 2012:111), citizens' use of e-government is limited unless they have resources or materials required to use modern ICT, especially the internet. In this context, Van Dijk (in Shareef *et al*. 2010:91) argues that if a country cannot make available the skills and resources required for using e-government services to all citizens equally, the country cannot expect the same capability from all citizens to adopt e-government. The availability of

resources necessary for the use of e-government has behavioural, economic, cultural, social and technological aspects. Generally, where computers, the internet and other modern ICTs are not available, citizens are economically poor, less educated, unaware of modern technology, and lack the necessary skills to use the technology. Consequently, they do not believe that they will receive benefits from using e-government services.

Quality of information

In marketing, when something is not relevant, not useful, or difficult to use, an individual loses interest in getting it (Shareef *et al*. 2011:26). In this context, when e-government services are perceived irrelevant, not useful and difficult to find, the potential user will not be interested. Relevant and updated online government information and services are critical to citizens' use of e-government services.

Quality of customer service

From the behavioural point of view, recurring users of e-government will form beliefs and thus attitudes to adopt e-government if they perceive higher customer service in e-government. Traditional government service has a different approach to e-government. Therefore, if citizens perceive a higher level of customer service in e-government than that offered in a traditional government office, they will be motivated to adopt and use e-government (Shareef *et al*. 2011:20). If citizens and businesses feel that they do not get any customer service in e-government when they require it, when they realise that they are being treated unfairly (calls and emails not answered, loss of documents sent online, disclosure of personal information to a third party, etc.) they will suspend the use of e-government. In addition, when they realise that the customer-oriented service policy of government websites is not credible, they are less likely to adopt e-government. Citizens will rather go back to their old system of face-to-face interaction with public officials at their offices (Shareef *et al*. 2011:21).

Website design with multilingual option

Virtual transaction requires some extra facilities for individuals with different ethnic backgrounds (Shareef *et al*. 2011:28). This criterion is especially important for a country that comprises multicultural and multilingual groups. Most of time the content posted on the government websites is presented in foreign languages, mostly

English, Afrikaans and French, but this creates a barrier to citizens with less education. According to Matteson and Jaeger (2009:92) there is a cause-effect relation between the use of the native language of a user on a website as the medium of instruction and the adoption of the website by that user. If an individual can interact with a website using his/her primary language, he/she might feel more culturally connected and have a more positive attitude towards using the website. The analysis of 93 websites from local companies in China, India, Japan and the USA found that a single-language option other than mother tongue for viewing, collecting, interacting and transacting with an e-government website is a significant barrier, especially for citizens with less education (Matteson & Jaeger 2009:89).

Trust, security and privacy

Trust in the e-government context is associated with security and privacy. Citizens' trust requires maintaining security in handling information, protecting the privacy of citizens, and assuring them that their personal information will be treated with confidentiality. Without this assurance it will be difficult to promote the use of e-government services (Alshawi & Alalwany 2009:201). According to Belanger and Carter (2005:11), users of e-government are always worried about privacy. Therefore, potential users might be reluctant to use the e-government system if they are not sure about privacy and if they are afraid that websites can disclose, share or misuse their personal information or that hackers can intercept their confidential information.

Full involvement and commitment of political leadership

Political leadership involvement and commitment affect the success of e-government. According to Dzidonu (2011:17), a sustained championship of the national ICT process including the e-government initiative is the key factor for e-government success. E-government projects demand money and other resources, and therefore full understanding and involvement of top political leadership and top management are very important.

A number of empirical studies have been conducted to determine the factors that influence the adoption of e-government services. A brief overview of the findings from previous empirical studies is given in the next discussion.

4.5 BRIEF OVERVIEW OF PREVIOUS EMPIRICAL STUDIES ON ADOPTION OF E-GOVERNMENT

A number of empirical studies on the adoption and usage of e-government by citizens have been conducted in the developed countries. However, relatively little has been undertaken to study the usage of e-government by citizens in developing countries, particularly in Africa. Previously undertaken studies used the technology acceptance theories and models mentioned earlier to study the adoption and usage of e-government services. The table below provides summarised findings of the previous empirical studies on the adoption and usage of e-government.

Table 4.1: Brief overview of previous studies on the utilisation of e-government

1. Belanger and Carter (2003:11-20). Belanger and Carter surveyed 140 students in the USA to determine factors that influence citizens' adoption of e-government services. The DoI model was used. **Findings**: The findings showed that higher levels of relative advantage and compatibility are associated with an increased intention of citizens to use e-government services.
2. Hung, Chang and Yu (2006:16-39). Based on the Theory of Planned Behaviour (TPB), Hung, Chang and Yu investigated citizens' acceptance of the online tax filing and payment system in Taiwan. **Findings**: Perceived usefulness (relative benefits), ease of use, trust of the system, computer literacy and facilitating conditions were critical factors in the adoption of the online tax filing and payment system. In addition, the findings showed that perceived usefulness of an innovation by the users determines the adoption rather than perceived ease of use.
3. Phang, Li and Kankanhalli (2005: 123-139). Based on the Technology Acceptance Model, Phang *et al*., (2005) studied the adoption of e-government services by Chinese senior citizens. **Findings**: Usefulness of e-government which was determined by internet literacy and perceived ease of use were determinant factors. Social influence and compatibility had less influence.
4. Akman, Yazici, Mishra and Arifoglu (2005:239-257). A study was undertaken by Akaman *et al.* (2005) in Turkey to investigate the impact of gender and education on the use of e-government services. **Findings:** Differences in gender and education had an important impact on the adoption

of e-government services in Turkey. It was found that males knew and used e-government services more than females. In addition, it was found that as the level of education of respondents increased, the level of awareness and the use of e-government services also increased.

5. AlShihi (2005:1-15).

A study was undertaken by AlShihi (2005) to investigate the development and adoption of e-government services in Oman. Employees in both the private and the public sector were surveyed.

Findings: Employees' lack of IT knowledge; awareness and motivation; under-marketing of e-government; lack of proper regulatory framework (government policy and clear legislation); and lack of trust and confidence in the system by users were found as barriers to the use of e-government services in Oman.

6. Ngo Tan Vu Knanh (2012: 3-23)

A study was undertaken in Vietnam to investigate the critical factors affecting e-government adoption.

Findings: E-government adoption was influenced by: (i) governing factors (national e-government vision, top management support, and budget independence; (ii) social factors (citizens' awareness, ICT training and social influence); (iii) technical factors (availability and access to IT infrastructure, IT experts); (iv) collaboration and partnership (public-private partnership, communication and collaboration between public institutions); and (v) perceived attributes of e-government by citizens

7. Mpinganjira (2012:500-517).

A study was undertaken by Mpinganjira (2012) to investigate the use of online government services by citizens in the Gauteng province (South Africa). 380 respondents participated in the survey.

Findings: Important challenges to the use of e-government services were: security-related challenges, lack of awareness, access-related challenges, skills-related challenges and service-quality-related challenges. The study was undertaken in the urban areas of the Johannesburg metropolis, and it illustrated the challenges faced by urban people in using e-government services. But it did not provide the challenges faced by rural communities as their challenges in the use of e-government services might be different from those faced by the urban community. Therefore this study was undertaken, among other things, to fill this gap.

Based on the discussions on models of innovation adoption and diffusion, the researcher comes up with a research model which will help to assess the utilisation of e-government by the selected district municipalities.

4.6 RESEARCH MODEL TO ASSESS THE UTILISATION OF E-GOVERNMENT BY THE SELECTED DISTRICT MUNICIPALITIES

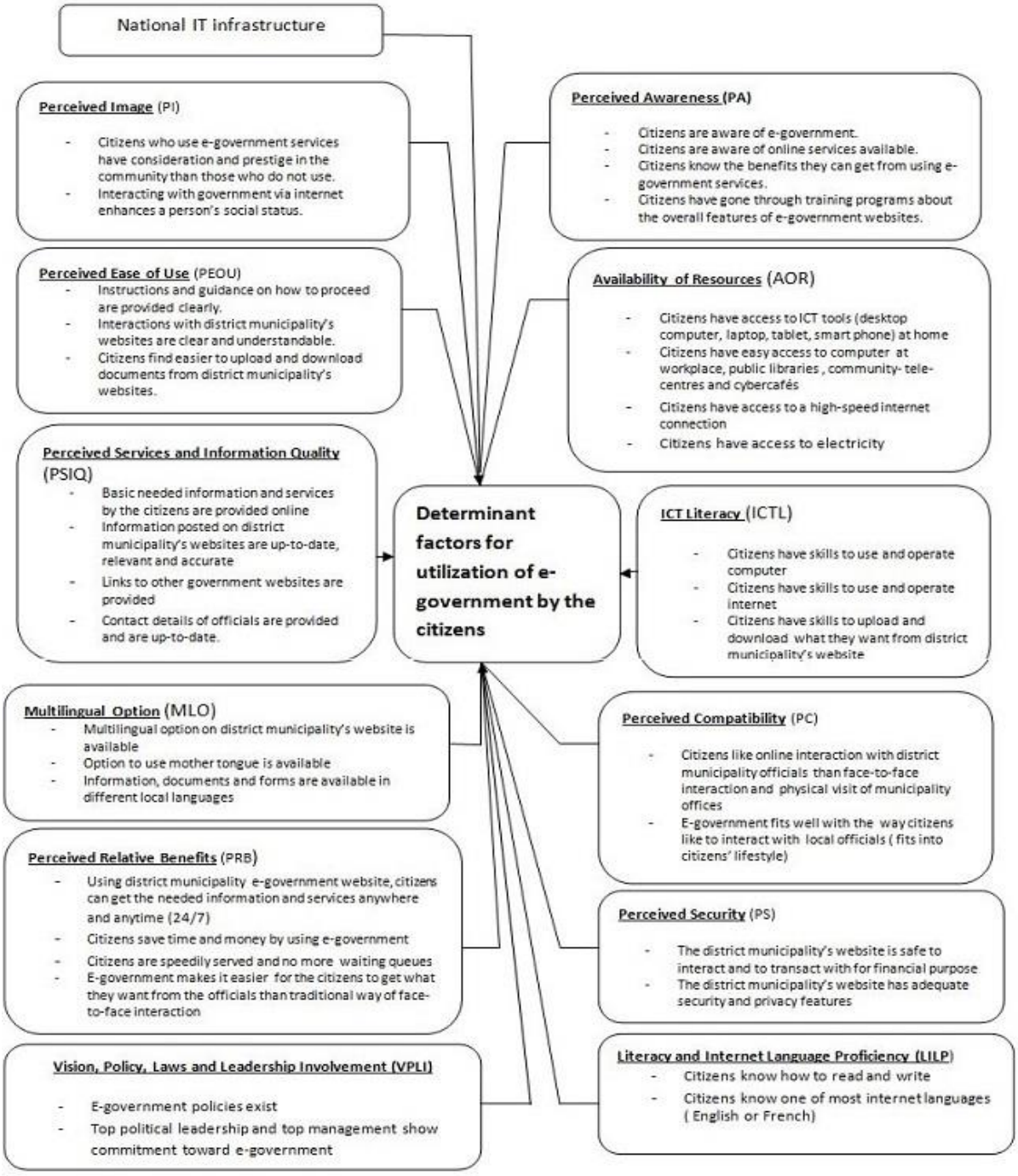
A model was developed for this research to assess the utilisation of e-government by the selected district municipalities. This research model was drawn from all the discussions presented earlier on the theories and models of DoI and UTAUT.

Description of the research model

As shown in Figure 4.3, the research model was adapted from previously developed models and consists of 13 factors. According to the model, the adoption and usage of e-government by the selected district municipalities and citizens might be determined by factors such as:

- Well-developed national IT infrastructure;
- Citizens' awareness and district municipality officials' awareness;
- Social impact (image) associated with the use of e-government services;
- Access to ICT tools by citizens;
- Degree of ease of use associated with e-government;
- Quantity and quality of online information and services posted on the district municipality websites;
- ICT literacy among citizens, but also among district municipality officials;
- Multilingual option of e-government website;
- Perceived relative benefits of e-government by citizens, but also by public officials;
- Compatibility of e-government with the lifestyle (values and beliefs) of citizens and public officials;
- Perceived security and trust toward e-government by citizens;
- Existence of vision, policy, legislation about e-government;
- Top political leadership commitment towards e-government development; and
- General literacy and internet languages proficiency among citizens.

Figure 4.3: Research model to assess the utilisation of e-government



Source: Adapted from DoI (Rogers, 2003) and UTAUT (Venkatesh *et al*. (2003) models.

The research model as described above helped to design a questionnaire for the research and analysis of the findings.

4.7 SUMMARY

A number of studies over the years have been undertaken to investigate the adoption and usage of e-government services using technology acceptance theories and models as quoted earlier in this research. This study used two models, namely the DoI model and the UTAUT model, to understand the utilisation of e-government by the selected district municipalities. According to the DoI model, the adoption of an innovation such as e-government by the members of a given society is a process that requires time and therefore cannot be a one-day decision. The process comprises four stages. At stage 1(knowledge stage) an individual must have some information or knowledge about the innovation. The questions such as: What? How? and Why? need to be answered before a person takes a decision to engage with an innovation. Here, the awareness campaigns are critically required. At stage 2 (persuasion stage), the social reinforcement from others (colleagues, peers, etc.) affect the individual's opinions and beliefs about the innovation. Here, opinion leaders in the society play an important role to persuade other members to use the innovation. At stage 3 (decision stage) a person finds that the innovation offers more advantages than disadvantages and he or she will start using it and integrating it into his or her daily life. At stage 4 (confirmation stage), a person opts for the full adoption of an innovation.

Furthermore, the DoI model presents the attributes of an innovation that can determine its adoption or not. The first attribute is relative advantage. For a person to adopt an innovation, he or she must have positive perceptions about it. He or she must perceive it as useful for him or her, especially in terms of money and saving time. The second attribute is compatibility. An innovation must not contradict his or her values and beliefs; it should rather be compatible with his or her needs. The third attribute is complexity. An innovation must be easy to learn and use. When an innovation is easy to understand, learn and use, it is likely to be more quickly adopted than the one which is complex and difficult.

The determinant factors for an innovation adoption presented in the DoI model are almost the same as the ones presented in the UTAUT model. However, one important factor, which is "*Facilitating conditions*", is added. An individual will adopt an innovation if he or she is facilitated to have access to it and use it. As far as the

utilisation of e-government services by citizens is concerned, quality education and sufficient income are critical facilitating conditions.

Finally, based on the DoI model and the UTAUT model, a research model for this study was developed and consisted of 13 constructs. The 13 constructs helped in designing the questionnaire for the study. The next chapter presents the methodology applied to the study.

CHAPTER 5: RESEARCH METHODOLOGY

5.1 INTRODUCTION

In the course of generating scientific knowledge, social researchers are requested to utilise methods and procedures which are based on facts that would enhance the probability of attaining validity (Mello 2007:83). For this reason, the social researcher has to decide which research approaches, methods and techniques are to be used to reach the goal of valid knowledge.

While the previous chapters of the research provided an introduction and background to the study and the review of the literature related to the study, this chapter presents a detailed description of the methodology employed for the study. According to Mustafa (2010:4), research methodology refers to the methods the researcher uses in performing research enquiry. It is an orderly way consisting of a number of steps to systematically solve the research problem. The research process is explained in this chapter. Firstly, it starts by recapitulating the problem statement, the research questions and research objectives for the study. Secondly, it explains the underpinning research philosophy or research paradigm, the research approach, the research design, the sampling procedures, the data collection instruments, the data analysis methods, and how validity and reliability of the findings were assured.

5.2 PROBLEM STATEMENT

Zikmund (2000:12) states “a problem well defined is a problem half-solved”. Furthermore, Makgalancheche (2006:46) argues that a researcher who does not formulate a research problem clearly would be said to be suffering from blindness. Therefore, any scientific research usually begins with clarifying the research problem.

The research problem for this study has been formulated from what was reported about community protests about poor service delivery in local spheres of government, the misuse of public money and the poor participation of citizens in the public decision-making process. For more than 15 years both the South African and Rwandan governments showed the need for modernisation of public services and

local governments through the implementation of ICTs in order to eradicate the problem of corruption, mismanagement and poor service delivery. However, despite this noble wish and significant amount of money invested in ICT development, citizens and the authority at central government are not satisfied with the ways local spheres of government in South Africa and Rwanda are delivering public services to citizens and the ways public money is used for the benefits of the community.

Abuse of public money at the local sphere of government, as shown in the South African Auditor-General's reports on public money expenditure (2012-2013 fiscal year), and the community protests about poor service delivery and the lack of citizen participation in decision-making processes are all evidence that something should be done to streamline administrative activities and the functioning of local government both in South Africa and Rwanda. The problems of poor service delivery, poor participation by citizens in the public decision-making process and the misappropriation of public money frequently reported in the local sphere of government could result from, among others, the inability of district municipalities to use ICTs appropriately to serve the community and the inability of citizens to use ICT, particularly the internet to enhance their influence and participation in the public decision-making process. Therefore, the research hypothesis that this study addresses is that ICT infrastructure and e-government are underutilised by district municipalities in Rwanda and South Africa, which in turn negatively affects public service delivery and efficient and effective use of public money.

5.3 RESEARCH QUESTION

According to Leary (2004:88), the nature of the research question is a key determining factor in the exploration of potential methodology design. Research questions guide and encourage the researcher to find solutions and to discover the reality of the phenomenon in question. For the purpose of this study, one main research question and six sub-questions were formulated to guide the study. The main research question was: "How effectively is e-government currently being utilised by the district municipalities of Fezile Dabi and Lejweleputswa in South Africa and Kicukiro and Kamonyi in Rwanda?" And the sub-questions were:

S.Q1: What is the expected role of e-government as far as service delivery is concerned in the identified district municipalities in South Africa and Rwanda?

S.Q2: Is there a difference in the level of awareness of the customers (citizens) of e-government in each of the four selected district municipalities on the purpose and benefits of e-government?
S.Q3: What online services are currently offered to the customers by each of the four selected district municipalities?
S.Q4: How effective are the online services provided by each of the four selected district municipalities utilised by the customers?
S.Q5: What are the factors influencing the utilisation of e-government services by the citizens?
S.Q6: What are the main constraints in the delivery of e-government services at the local spheres of government in South Africa and Rwanda?
S.Q7: Do the selected district municipalities have the same constraints?
S.Q8: How can e-government be improved in order to enhance service delivery at the local sphere of government?

To answer these research questions, a clear and well-designed methodology is critical to ensure the integrity and validity of the outcome of the study.

5.4 THE RESEARCH PARADIGM UNDERPINNING THE STUDY

According to Denzin and Lincoln (1994:91), paradigm is defined as a basic set of beliefs that guide action. Paradigms are human constructions; they define the world-view of the researcher. For Neuman (2011:94), a paradigm is defined as a general organising framework for the theory and research that includes basic assumptions, key issues, models of quality research and methods for seeking answers. It is critical to identify and justify the philosophical assumptions and beliefs a researcher adopts in a research process. Krauss (2005), quoted in Achemfour (2013:140), argues that philosophical assumptions about the nature of reality are crucial to understanding the overall perspective from which a study is designed and carried out. The research paradigm guides the researcher about how to interpret, understand social phenomena and how to explore the social world. It guides the researcher about the relevant data to be gathered and how to utilise and analyse them (Achemfour 2013:141).

There are two main research paradigms which are used in the scientific process, namely positivism and post-positivism or interpretivism (Denzin 2011: 26). The

opposing philosophical assumptions of the positivists *vis-à-vis* the post-positivists have been identified and are summarised in the following paragraphs: A positivist epistemological standpoint advocates that the world is a fixed entity whose mysteries are not beyond human comprehension. For positivists, social research is a purely scientific endeavour that needs to follow set rules and procedures.

A positivist ontological position advocates that the ultimate purpose of research is to obtain scientific explanation to discover and document universal causal laws of human behaviour. Positivist researchers advocate that there is a reality out there to be studied, captured and understood (Neuman 2011:96). A positivist methodological position advocates that the objectivity in the research process could be attained if the researcher distances himself from participants (researcher-independent). The methodologies are usually: (i) *deductive*- the researcher tests a theory and looks for confirmation through observations; (ii) *hypothesis-driven*- the researcher proposes a tentative statement that he attempts to prove or disprove; (iii) *reliable and reproducible*- the researcher uses methods that will give the same results under repeated trials. Furthermore, a positivist paradigm advocates that the research findings should be generally: (i) *quantitative*- represented through numerical data; (ii) *statistically significant*; and (iii) *generalisable*- the findings are applicable to a population beyond a sample (Leary 2004:6).

Entering the latter half of the twentieth century many research assumptions conveyed by positivist researchers began to be questioned, critiqued, and even denigrated by post-positivist researchers who started looking at possibilities for the construction of knowledge beyond positivist assumptions. Therefore the post-positivism paradigm was developed (Leary 2004:5). The post-positivists or interpretivist researchers advocate that it would be too superficial to study social phenomena distanced from the social actors as advocated by positivists. They argue that social phenomena should be viewed from the actors' viewpoint. This suggests that the social world cannot be understood by applying only natural science principles, but should be explained from the interpretations and meanings that social actors attach to social phenomena under study (Achemfour 2013:140). Post-positivist researchers advocate that the universe is complex and believe that the world may not be knowable. They see the world as infinitely complex and open to interpretation and the interpretation of the researcher cannot be value-free. While

positivist researchers advocate that there is a reality out there to be studied, captured and understood, post-positivist and interpretive researchers argue that reality can never be fully apprehended, but only approximated. Objective reality can never be captured (Achemfour 2013:141).

The post-positivist researchers who are called “interpretive researchers” in some literature advocate that multiple methods could be used as a way of capturing as much of reality as possible. The use of multiple methods or triangulation reflects an attempt to secure an in-depth understanding of the phenomenon in question. Interpretive researchers conduct their research in ways that are: (i) *participatory and collaborative*- the researchers can work both for and with participants. One cannot study the social phenomena in the social world without being part thereof; (ii) *subjective*- the researchers acknowledge being value-bound. The interpretivists admit to biases and human capacity limits that can affect their studies (Neuman 2011:102).

Concerning the research findings, post-positivists recognise the uniqueness of situations or cultural groups, but can still seek broader value in the findings. Post-positivists seek findings that are: (i) *idiographic*- findings may not be able to be generalised, yet have their own intrinsic worth; (ii) *transferable*- the lessons learned from one context are applicable to another context; (iii) *valuable*- post-positivist researchers are often interested in both production of social knowledge and contributions to change; and (iv) *qualitative*- the findings are often represented through imagery and texts or words (Myers 2009:36).

The post-positivism or interpretivism paradigm is not without criticism. One of the criticisms against the interpretivism paradigm is that researchers become so immersed in the research process that research outcomes represent no more than the views of the researcher and therefore lack objectivity and reliability. The interpretivist approach is also criticised for limited outcomes and the inability to generalise findings to larger populations (Achemfour 2013:142). However, these limits can be overcome through the utilisation of multiple data collection methods (triangulation) and sound sampling methods.

As far as the research paradigm for this study is concerned, the post-positivist or interpretive paradigm guided the researcher. In this research the researcher

acknowledges more post-positivist assumptions than positivist assumptions. This is justified by the following: The fact that the social world from which the enquiry is carried out to investigate a social phenomenon such as the utilisation of e-government is complex, and therefore reality cannot be fully apprehended, but only approximated.

The research on the utilisation of e-government by the selected district municipalities might help to know the truths, but there might be other things (truths) that the researcher might not be able to understand and interpret in all their complexity. The study on the utilisation of e-government is complex in itself because of many factors such as, among others, technological, socio-economic, geo-political and cultural factors which might determine the utilisation of e-government by district municipalities, and the use of online services by citizens. Furthermore, the nature of the study requires field research and contact between the researcher and the researched in order to know in the most detailed way the knowledge, feelings, interpretations and intentions of citizens toward e-government services. Therefore, because of the complexity of the research enquiry, the researcher acknowledges being value-bound and admits probable biases in the research process which might affect research findings.

Concerning the methods of data collection and data analysis, the researcher admits to post-positivism assumptions. There is no way that in-depth description, in-depth investigation and in-depth understanding about the use of e-government by social actors living in social world can be done by applying natural science principles or by using only the empirical method (quantitative approach). The combined methods approach was critical to collecting both qualitative and quantitative data necessary to answer the research questions for this research. Documentary research, face-to-face in-depth interviews and surveys (triangulation) were utilised by the researcher to investigate the utilisation of e-government by the selected district municipalities.

Last but not least, the researcher admits to interpretivist assumptions about the generalisation of research findings. It is critical to specify that the findings of this research are specific to the cases being investigated and therefore cannot be generalised or applied beyond the cases being studied. This was indicated as one of the limitations of the study.

5.5 THE RESEARCH APPROACH UNDERPINNING THE STUDY

A research approach is a detailed framework guiding a researcher through the research process (Neuman 2011:162). There are generally two broad research approaches: the so-called quantitative versus qualitative approach. A distinction could be made between the quantitative and qualitative approach in social sciences. According to Maki (2009:12), quantitative research largely seeks explanations, while qualitative research aims at in-depth description. In a quantitative study, researchers rely more on positivist principles and use a language of variables and hypotheses. The emphasis is on precisely measuring variables and testing hypotheses. In a qualitative study, the emphasis is more on the principles from the interpretive paradigm (Neuman 2011:165). Quantitative research produces results in numbers (deals with numerical data), while qualitative research produces flow diagrams and narrative descriptions of events or processes (Rohilla 2010:54). Furthermore, Creswell and Plano (2011:9) argue that qualitative data provide a detailed understanding of a problem while quantitative data provide a more general understanding of a problem. The qualitative understanding arises out of studying a few individuals and exploring their perspectives in great depth whereas the quantitative understanding arises from examining a large number of people and assessing responses to a few variables.

Qualitative research and quantitative research provide different perspectives, and each has its limitations. In this context, Creswell and Plano (2011:10) argue that when researchers study a few individuals qualitatively, the ability to generalise the results to many is lost. Also, when researchers quantitatively examine many individuals, the understanding of any one individual is diminished. Therefore, the limitations of one method can be offset by the strengths of the other method and the combination of quantitative and qualitative data provides a more complete understanding of the research problem than either approach by itself (Creswell & Plano 2011:10). The combination of both qualitative and quantitative approaches is known as the mixed methods approach. With mixed methods research, the researchers are enabled to use all of the tools of data collection available rather than being restricted to the types of data collection typically associated with quantitative research or qualitative research respectively. The mixed methods research helps answer questions that cannot be answered by quantitative or qualitative approaches

alone. The mixed methods research is “practical” in the sense that researchers tend to solve problems using both numbers and words (Creswell & Plano 2011:13).

As far as the research approach for this research is concerned, the mixed methods approach was appropriate and was therefore used. The mixed methods approach helped the researcher to deeply investigate the topic of research. It further increased the reliability and validity of research findings because the data from documentary research and information collected from semi-structured interviews corroborated the data from surveys.

In addition, Quartaroli and Lapan (2009:248) state that the mixed methods approach has two dimensions: time orientation and dominance. Time orientation refers to whether multiple data collection methods will occur concurrently or sequentially. Concurrent design means that both data collection methods (survey and interviews) occur simultaneously, namely a researcher can collect survey data at the same time as conducting interviews. Sequential design means that there is a kind of chronological order where, for instance, the researcher administers a survey and then follows up with qualitative methods, such as interviews or observations (Quartaroli & Lapan, 2009:249). For the purpose of this research, both concurrent and sequential design was used as the researcher was conducting interviews with district municipality officials while the field assistants were busy with surveys in the townships, but the researcher had some interview sessions after the surveys were completed. This was done in order to gain more explanations about some issues which were raised by the respondents during the surveys. The second dimension of the mixed methods approach is the dominance of one data strand over another. In qualitative-dominant design, the researcher is primarily interested in the results gleaned from qualitative research, but recognises that the addition of quantitative data would enhance the findings. In this case, quantitative data can provide additional evidence to support qualitative findings. In quantitative-dominant design, the researcher adopts a predominantly quantitative approach, but supplements the quantitative data with qualitative data (Quartaroli & Lapan 2009:249). This research adopted a predominantly qualitative approach, but supplemented the qualitative data with quantitative data. This was used for complementarity, and for validity and reliability purposes.

5.5.1 Qualitative research design underpinning the study

According to Makgalancheche (2006:89), qualitative research designs can be: (i) *the historical design*- social phenomena are studied in their historical context; (ii) *the biographical design*- the biographical design centres on a person's life; (iii) *the grounded theory design*- the theory is created based on observation rather than on deduction; (iv) *the ethnographic design*- an ethnographic design takes an anthropological approach to research; (v) *the phenomenological design*- this research design is commonly used to understand and interpret the meaning that subjects give to their everyday lives; and (vi) *the case study design*- a case study is an explanation of a bounded system characterised by time and place. It implies a detailed, in-depth data collection which involves multiple data collection methods (triangulation) in order to get full and sufficient information about the case or cases. According to Mello (2007:23), a case study is defined as an in-depth description and analysis of a bounded system. Cases studies make it possible to understand mechanisms, such as what is done, and how it is done.

As far as the qualitative research design is concerned, this research is a case study research, because the focus was not on all district municipalities of Rwanda and South Africa, but the study focused on selected district municipalities of Fezile Dabi and Lejweleputswa in South Africa and Kicukiro and Kamonyi in Rwanda. The emphasis on particular case studies allowed an in-depth description and investigation of the utilisation of e-government by the selected district municipalities.

In addition, Quartaroli and Lapan (2009:168) provide and distinguish between three different designs of case study, namely snapshot case study design, longitudinal design and comparison design. Comparison design is a design in which different cases are studied at a given site or at more than one location. The unique purpose served in this approach is not only to generate individual case patterns, but also to note commonalities and differences found when comparing the cases (Creswell & Plano 2011:12). In this context, this research is not only a case study research, but a comparative case study research. The researcher firstly aimed to thoroughly investigate the utilisation of e-government by individual district municipalities, and then compare how the selected district municipalities utilise e-government in order to note commonalities and differences found when comparing these cases. The

comparative case study assisted in the evaluation of the gaps that exist between cases and in establishing if one can learn from the experiences of another (best practices sharing).

5.6. POPULATION AND SAMPLING

In this section, the population of the study and sampling selection procedures are discussed.

5.6.1 Target population

Research population refers to the entire group of people, organisations, units, events or things of interest that the researcher wishes to investigate (Mavhivha 2007:66). According to McMillan and Schumacher (1989) quoted (in Mavhivha 2007:66), the research population is defined as a larger group of cases from which a sample can be selected. They further argue that where populations are small, easier to be identified and accessible, sampling is not necessary, because all cases can be included in the investigation.

The target population for this study comprised of all members of the general public, aged 18 years and older, living in the selected district municipalities in South Africa and Rwanda. This age group was considered because the researcher assumes that a person under the age of 18 is not mature enough and not sufficiently informed to be able to understand and answer the questionnaire properly. In this context, Leary (2004:53) argues that respondents or participants in a research must be: (i) *Competent*- they have the intellectual capacity and psychological maturity necessary to understand the nature of the research and their involvement in the study; (ii) *Autonomous*- they are making self-directed and self-determined choices. According to Statistics South Africa (2013: online), the population of the Fezile Dabi district municipality is 488036, and 627626 in case of the Lejweleputswa district municipality. The figures of the Rwanda National Institute of Statistics (2012) indicate that the population of the Kicukiro district is 319661, while that of the Kamonyi district municipality is 342792. Therefore, the size of the population from which a representative sample was drawn is approximately 1,778115 million in total.

5.6.2 Sampling unit

According to Mustafa (2010:150), before drawing a sample the researchers have to decide the unit of the sample. What shall be selected? A house? A family? An individual or a group of individuals? The main types of sampling units can be:

- Geographical units. For example: a state, district, city, ward, region or locality;
- Structural units. For example: a house, a residence or a flat;
- Social group units. For example: a family, a school, a club, a church; and
- Individuals.

For this study, the sampling units selected were individuals who are potential users of e-government services. These individuals were members of black communities living in the townships. Black individuals were only considered for the purpose of homogeneity of units, subject to comparison.

5.6.3 Sampling techniques

Sampling is the selection of some part of an aggregate or totality on the basis of which a judgment or inference about the aggregate or totality is made (Kothari 2004:34). According to Polonsky and Waller (2011:139), sampling is defined as the process of choosing a small number of respondents from a larger defined target population, assuming that the results discovered about the small group will help the researcher to make conclusions concerning the larger group. The primary objective of sampling is to obtain accurate and reliable information about the universe with the minimum of cost, time and energy. In this context, Mustafa (2010:135) argues that sampling is the best alternative in the case of social surveys because its advantages, namely (i*) Saving of time* **-** when a smaller number of units are selected and studied it requires much less time than the census method; (ii) *Saving of money***-** a survey of a smaller number of cases not only requires less time, but also requires less money and the study can be financed with much less resources; (iii) *Detailed study***-** when the number of units is large, a detailed study is not possible. The smaller number of cases in the sample permits a more minute observation and detailed study; (iv) *Accuracy of result***-** if the sample has been properly selected the results are within a very close range of accuracy; and (v) *Administrative convenience***-** a small sample is usually more convenient from an administrative point of view. Despite the said

advantages of sampling methods, some limits are attributed to sampling methods, namely (i) *Chances of bias*- sampling may lead to biased selection and thereby leads the researchers to draw false generalisations; (ii) *Difficulties of a representative sample*- selection of a completely representative sample is very difficult particularly when the phenomena under study are of a complex nature; and (iii) *Difficulties in sticking to sample*- the selected units may be widely dispersed, some respondents may refuse to co-operate with the researcher, others may be inaccessible (Mustafa 2010:136).

As far as the comparative study on the utilisation of e-government by the selected district municipalities in both South Africa and Rwanda is concerned, a sampling method was necessary, because the universe was too vast and geographically scattered. To ensure that a sound sample was selected, two attributes of reliable sampling, which are accuracy and precision, were highly considered. According to Cooper and Schindler (2011:367), accuracy denotes the degree to which a sample is devoid of bias while precision demonstrates how closely the sample represents the population.

There are two sampling methods, namely the non-probability sampling and the probability sampling method. Non-probability sampling is defined as a sampling technique that does not use chance selection procedures to identify those people who will participate; it rather relies on the personal judgement of the researcher to decide who will be included in the sample (Polonsky & Waller 2011:139). Some of the types of non-probability sampling include: convenience sampling, quota sampling, purposive or judgemental sampling, and snowball sampling. Probability sampling is a sampling procedure in which each element of the population has the same probabilistic chance of being selected from the sample (Rohilla 2010:123). Some of the specific types of probability sampling include: simple random sampling, stratified random sampling, cluster sampling, systematic random sampling, and multistage-sampling (Mustafa 2010:139).

Because two categories of respondents were targeted in this study, probability and non-probability sampling methods were used, namely purposive sampling (non-probability) and simple random sampling (probability method). Purposive or judgemental sampling implies that the researcher deliberately or purposively selects

certain units from the universe for study. In this type of sample selection, the choice of the selection is supreme and nothing is left to chance (Mustafa 2010:142). Purposive sampling was used to select members of staff of the district municipalities who were knowledgeable and involved in e-government service delivery (Group A of respondents). The simple random sampling method ensures that each of the N units in the population has equal chance or the same chance of being selected (Mustafa, 2010:139). Some advantages are attributed to this sampling method. Simple random sampling is free from bias and, therefore, not affected by the choice of the researcher. It is generally more representative because each unit has an equal chance of being selected (Mustafa 2010:140). In this research, simple random sampling was used to select the potential users (citizens) of e-government services in each selected district municipality (Group B of respondents).

5.6.4 The sample size

The size of the sample is an important element to be decided in the case of sampling. This is because the size has a direct bearing upon the accuracy, time, cost and administration of the survey. Large samples are generally hard to manage and are unfit for detailed study, but may be essential for representativeness. According to Mustafa (2010:151), an optimum sample in a survey is one which fulfils the requirements of efficiency, representativeness, reliability and flexibility. The sample should be small enough to avoid unnecessary expenses and large enough to avoid intolerable sampling error.

Furthermore, Mustafa (2010:140-141) provides broad considerations to be kept in mind when determining the size of the sample:

- ***Homogeneity or heterogeneity of universe:*** If the universe is comparatively homogeneous, a smaller size of the sample may be sufficient. But, if the universe is heterogeneous, the sample has to be essentially larger in size. Because this study was a comparative study, black communities living in the townships were mostly targeted in order to obtain homogeneity of universe of the study. Therefore, the universe of the study was to some extent homogeneous which is why a larger sample was not needed.
- ***Nature of study:*** The size of the sample also depends upon the nature of the study. In the case of a general study a large number of cases can be taken, but if

the study is intensive and of a technical nature, a large number may become difficult to manage. This study was intensive and of a technical nature, therefore the researcher ensured that the size of the sample was manageable.

- ***Practical considerations:*** Practical considerations such as availability of finance, time at disposal, and number of trained field workers may be taken into consideration in deciding the size of the sample. In this study, limitations in terms of time and finance were taken into consideration to determine the size of the sample. However, accuracy and representativeness factors were highly considered.
- ***Size of the questionnaire:*** The size of the questionnaire and the nature of questions to be asked are also a limiting factor for the size of the sample. Because much information was needed to answer the research question and sub-questions of the study, the survey contained many questions to ensure that all items were covered. Therefore, the questionnaire was large in size and this was taken into consideration when selecting a manageable sample size for proper administration.
- ***Nature of cases to be contacted:*** If the cases are geographically scattered a small sample is more suitable. On the other hand, if the refusal rate is likely to be heavy or losses of cases likely to be quite big, a larger sample has to be selected. The respondents for this study were scattered (some in Rwanda and others in South Africa) which is why the size of the sample was kept manageable.
- ***Standard of accuracy:*** It is generally considered that the larger the size of the sample the greater the standard of accuracy or representativeness. However, a small but well selected sample may give better results than a larger and thoughtlessly selected sample. In this context, a manageable but thoroughly selected sample that guaranteed accuracy and representativeness was selected for the study.

Though Mustafa (2010:140) provides considerations to be kept in mind when determining the size of the sample, he does not give precisions on how to calculate and determine the size of the sample. To fill this gap, Leedy and Ormrod (2005:207) provide some guidelines which can help the researcher when selecting a sample size. They recommend the following:

- If the universe (population) is less than 100, sampling is not necessary but the researcher should survey the whole population;
- If the universe is around 500, then 50% of it should be sampled; and
- If the universe is around 1,500, then 20% of it should be sampled and beyond 5,000 or more units, a well selected sample size of 400 is considered as sufficient.

Based on the above-mentioned guidelines, a well-selected sample of **400** was considered large enough to guarantee accuracy and representativeness. The sample consists of 200 respondents from South Africa and 200 from Rwanda.

5.7. DATA COLLECTION METHODS

According to Fisher (2006: 12), there are primary data collection methods and secondary data collection methods. Primary data are considered as those which are collected afresh and for the first time, and thus happen to be original in character. Secondary data refer to the data which have already been collected and analysed by someone else. They mainly consist of published and unpublished data.

As far as the data collection methods for this study are concerned, two primary data collection methods, namely surveys and interviews were used. To this end, a well-designed questionnaire and a semi-structured interview guide were designed.

5.7.1 Questionnaire

A questionnaire is one of the most important data collection methods in the social sciences (Nachmias &Nachmias 2008:232). A questionnaire is a tool which helps to collect data from the field and it is to be filled out by an informant or respondent. It is generally designed to collect data from large, diverse and widely scattered groups of people (Mustafa 2010:193). There are two main typologies of questionnaires. On the one hand, researchers may use structured questionnaires whereby questions are pre-designed, and on the other hand, researchers may utilise unstructured questionnaires whereby the questionnaire contains a set of questions which are not structured in advance and which may be adjusted according to the needs of the question period (Mustafa 2010:194). The structured questionnaire may be further categorised into two: closed-ended questionnaire and open-ended questionnaire.

The open-ended questionnaire is one in which the respondents have full choice. Respondents are not given a specific set of responses (Nachmias & Nachmias 2008:233). A closed-ended questionnaire is one in which questions are set in such manner that only a few alternative answers are possible.

For the purpose of this study, the structured questionnaire with predominantly closed-ended questions was prepared in English. As the questionnaire was in English and the study was to be carried out in Rwanda and in South Africa, it was necessary to translate it into Kinyarwanda, the native language spoken in Rwanda, and into Sesotho, the native language spoken by black communities in the Free State Province.

Format of the questionnaire

One of the most common formats researchers use to ask questions in surveys is the rating scale, whereby the respondent makes judgements in terms of sets of ordered categories (Nachmias & Nachmias 2008:234). In this study, items in the questionnaire were constructed in the Likert scale format. The five-point Likert scale ranging from 1 “strongly agree” to 5 “strongly disagree” was mostly used.

Components of the questionnaire

The items in the questionnaire were designed in a way to solicit answers to the research questions. Therefore, the questionnaire contained seven sections as follows:

Section A: Demographics

Respondents were requested to provide information on the following demographic data: gender, age, educational level, and occupation.

Section B: Computer and internet literacy

Respondents were requested to provide information on their level of computer and internet literacy.

Section C: Awareness of e-government services

Respondents were requested to agree or disagree with different proposed statements on the awareness of the district municipality websites and the awareness of e-government services available on the district municipality websites.

Section D: Factors influencing the use of e-government services by citizens

Respondents were requested to provide information on different factors that influence the intention to use e-government services such as availability of ICT tools, quality of online services, perceived usefulness of e-government services, ease of use of e-government, and perceived security and privacy of e-government.

Section E: Online information and services currently offered by district municipalities to citizens and level of utilisation of those online services.

Respondents were requested to provide information on the nature of online services currently available on the district municipality website, and the extent to which they are utilising those online services.

Section F: Appreciation of respondents on the impact of e-government services on the quality of service delivery.

Respondents were asked to provide information whether the use of e-government by the district municipality produced positive changes to their situation.

Section G: Limits or challenges encountered in the adoption and the use of e-government services.

Pre-testing the questionnaire

The pre-testing of the instrument is administered to a sample from the target population in order to identify and correct weaknesses in the instrument (Cooper & Schindler 2011:89). Though the questionnaire was carefully designed, there was a need for pre-testing to ensure clarity, validity and reliability. The questionnaire was tested on 20 respondents (5 respondents in each selected district municipality). The pre-testing helped to perfect the questionnaire by editing the content and layout for convenience and interpretability.

Administering the questionnaire

Data used in this study were collected in the Kicukiro and Kamonyi districts (in Rwanda), and the Lejweleputswa and Fezile Dabi district municipalities (in South Africa) from a sample of 400 members of the general public, aged 18 years and older. Five field assistants (two in Rwanda and three in South Africa) were used to assist in collecting the data. Before going out for fieldwork, the field assistants were first trained in issues relating to the questionnaire (the purpose of the questionnaire

was explained and every question in the questionnaire was reviewed and explained in order to have a common understanding). Also, the assistants were trained on ethical research issues that needed to be considered during data collection. The respondents were randomly selected and were approached in different townships, and formally asked to respond to the questionnaire. The data were collected between February and April 2015, and at the end of the data collection process a total of 400 responses were obtained, yielding a response rate of 100%. The response rate of 100% was obtained, because the questionnaires were not left for the respondents to complete, but were completed immediately by the researcher and field assistants as the respondents were responding to the questions.

5.7.2 Interviews

Interviews were another important tool of investigation used in this study. The interview is a method which requires a person known as “interviewer”, asking questions generally in face-to-face contact with the other person (Mustafa 2010:212). When an interview is conducted in an orderly and structured way, it is called structured interview. On the other hand, interviews may also be unstructured and informal.

Personal interviews were carried out in a semi-structured way. A semi-structured interview guide was used to conduct in-depth interviews with two senior management officials in each district municipality and one technician responsible for website development and maintenance. In addition, in order to gain wide views on e-government issues in the district municipality, seven members of staff from each selected district municipality were also interviewed. They were purposefully selected, due to their involvement with e-government service delivery. Therefore, at total of 40 district officials were interviewed, namely 10 interviewees in each district municipality. The in-depth face-to-face interviews were aimed at getting deeper insight into the following: (i) level of awareness of district officials about e-government; (ii) the role that e-government played or is playing to streamline administrative activities and to enhance the quality of service delivery to citizens; (iii) the type of online services so far offered to citizens; and (iv) the constraints in the utilisation of e-government by district municipality on the one hand and by citizens on the other hand.

In addition to surveys and interviews as the sources of primary data, legislation and policy documents were also consulted. The analysis of legislation and government policies helped to understand the link between legislation and policy provisions with the practical realities on the field regarding the use of ICT for service delivery purposes. It also helped to evaluate the quality of the evidence and credibility of information provided by interviewers.

Furthermore, secondary data for this research were collected through relevant secondary sources of data. These included, among others, articles from journals, dissertations, books, conference papers and workshop reports, news bulletins, government reports and novels. Bloomberg and Volpe (2012:74) argue that a review of literature enables the researcher to acquire a full understanding of the topic and what has already been said about it; how ideas related to the topic have been researched, applied, and developed; the key issues surrounding the topic; and the main criticisms that have been made regarding work on the topic. In this perspective, a deeper review of relevant secondary sources of data helped to understand and describe in detail the purpose and role of local spheres of government in Rwanda and South Africa, and the role of e-government as an enabling tool to streamline public administration activities and better service delivery in local spheres of government. The information collected from secondary sources was presented in Chapter 2 of the study and helped to answer the first sub-question of the research and to attain the first objective of the study.

5.8 ENSURING VALIDITY AND RELIABILITY OF THE RESEARCH

Validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analysing results and judging the quality of study (Rohilla 2010:79). This implies that the researcher should ensure the validity and reliability of measuring instruments.

5.8.1 Ensuring validity

According to Rohilla (2010:81), validity determines whether the research truly measures that which it was intended to measure. Here the researcher must provide supporting evidence that a measuring instrument does, in fact, measure the variable that it appears to be measuring (Nachmias & Nachmias 2008:233). To ensure the

validity of the research findings and conclusions, three types of validity as distinguished from the literature (content validity, empirical validity and construct validity) were taken into consideration in this research.

5.8.1.1 Content validity

Content validity means that the measurement instrument covers all the attributes of the concept to be measured and that nothing relevant to the phenomenon under investigation is left out. There are two common types of content validity: face validity and sampling validity. In ensuring content validity three things were done: (i) clear and unambiguous research questions and research objectives were formulated and from that, the key items to be covered in the questionnaire and interview guide were determined accordingly; (ii) after a carefully studied literature review, the questions contained in the questionnaire were compared to other questionnaires compiled by previous researchers in the same or similar area of study; and (iii) the questionnaire was presented to an external expert in the field of information science for comments, and most importantly it was cross-checked by the research supervisor to ensure that the most important aspects were covered in the research instrument.

Sampling validity was also ensured in this research. According to Nachmias and Nachmias (2008:132), sampling validity entails the extent to which the sample gives an accurate representation of the population which it is intended to represent. The researcher ensured sampling validity by adequately selecting sampling methods and the sample size. The researcher used purposive sampling to select key informants from district municipality staff for in-depth interviews, and random sampling to select respondents for the survey. The sample of 400 respondents was considered adequate for the purposes of the study and was at a higher level than sample sizes used in some similar studies which were found in literature.

5.8.1.2 Construct validity

According to Nachmias and Nachmias (2008:134), researchers establish construct validity by relating a measuring instrument to the general theoretical framework within which they conduct their studies in order to determine whether the instrument is logically and empirically tied to the concepts and theoretical assumptions they are employing. In ensuring construct validity, firstly, the measurement instrument was adapted from existing theories and models of acceptance and use of technology such as “Theory of Diffusion of Innovation (DoI) and Unified Theory of Acceptance

and Use of Technology (UTAUT)". Secondly, it was adapted from previous studies and literature on the utilisation of e-government services by citizens.

5.8.2 Ensuring reliability

Reliability is a matter of whether a particular technique, applied repeatedly to the same object, would yield the same result each time (Mouton 2003:119). Mouton (2003:120) further argues that reliability is a concern in social science surveys because of researchers' subjectivity. In addition, Rohilla (2010) states that it is not possible to develop a research instrument in social sciences to achieve 100% accuracy, because it is not possible to completely control factors that affect reliability. To ensure a high level of reliability, Kumar (in Agbobli 2013:140) provides the factors which would assist the researcher to minimise errors and the researcher's subjectivity in the research process:

- The wording of questions. Ambiguous questions from ambiguous wording could yield unreliable responses. Therefore, this factor was taken into consideration when designing the questionnaire for this research. In this context, ambiguous wording, too long and complex questions, leading and suspicious questions were avoided.
- The mood of the respondents as well as the interviewers can affect the reliability of the responses. A negative mood or anxiety also influences the interview process thereby rendering the responses unreliable (Agbobli 2013:141). To prevent this situation from happening during the data collection stage, the field assistants were coached and required to present a positive attitude so that their interactions with the respondents could be pleasant and satisfying.
- Researcher-respondent rapport. According to Nachmias and Nachmias (2008:136), interviewers who can establish effective relationships with respondents are able to collect more complete and accurate data. The relationship of confidence and understanding between researcher and respondent is fundamental. To instil confidence among the respondents, the researcher and field assistants introduced themselves (who they are, where they come from), the purpose of the research was explained, the anonymity of the respondent was guaranteed, and the respondent was told the procedure used to select him or her.

Last but not least, the field assistants were advised to be clear in what they were asking.

5.9 DATA ANALYSIS

According to Achemfuor (2013:159), data analysis refers to the breaking down of data so that answers to the research questions can be obtained. The process leads to the production of statistics that can be descriptive or inferential. Bloomberg and Volpe (2012:8) argue that the process of data analysis requires the researcher to seek relationships or patterns between various themes that have been identified and then categorise them. After the data were collected, the data analysis process started as follows:

5.9.1 Data preparation

Firstly, the collected questionnaires were collated and counted to determine the missing questionnaires. Secondly, they were checked cautiously one by one to identify incomplete questionnaires and other errors in the completion of questionnaires. In total, 400 questionnaires were completed and all were analysed.

5.9.2 Data coding

Data coding consists of assigning numbers or symbols to answers to facilitate the grouping of responses into a limited number of classes or categories (Achemfour 2013:160). Because the research generated a large amount of data from multiple sources, systematic organisation and systematic categorisation of the data were fundamental to prevent the researcher from becoming overwhelmed by the amount of data and losing sight of the research purpose and questions. The data coding process for this research followed the following steps: (i) familiarisation with data through carefully reading and re-reading the responses of the questionnaire and any additional information from interviews; (ii) organisation and indexing of data for easy retrieval and identification; (iii) identification of themes; (iv) development of provisional categories; (v) exploration of relationships between categories and finally refinement of themes and categories.

5.9.3 Statistical analysis

There are various statistical procedures which can be used by the researcher to analyse and present the research findings. Statistical procedures can be descriptive, inferential or both descriptive and inferential (Bloomberg & Volpe 2012:59). Descriptive statistics were predominantly applied in this study whereby data were

summarised in tables and graphics and then analysed. Furthermore, the Statistical Package for Social Sciences (SPSS) was used to analyse data collected from the questionnaires.

5.10 SUMMARY

Chapter 5 discussed the research methodology employed for the empirical part of the study. The research question and sub-questions were re-stated. The post-positivism/interpretivism paradigm, which was the appropriate philosophical orientation for the study, was elaborated and justified. The post-positivist researchers who are called “interpretive researchers” in some literature advocate that the social world cannot be understood by applying only natural science principles, but should be explained from the interpretations and meanings that social actors attach to social phenomena under study. They further advocate that multiple methods (triangulation) could be used as a way of capturing as much of reality as possible. Therefore, the researcher admitted the post-positivism assumptions, because there was no way in-depth description, in-depth investigation and in-depth understanding about the use of e-government by social actors living in the social world could be done by applying natural science principles or by using only the empirical method (quantitative approach). The mixed-methods approach was critical to collect both qualitative and quantitative data necessary to answer the research questions for this research. Documentary research, in-depth face-to-face interviews and surveys (triangulation) were utilised by the researcher to investigate the utilisation of e-government by the selected district municipalities.

In addition, the chapter outlined and explained the sampling techniques. The sampling method was necessary because the universe was too vast and geographically scattered. To ensure that the sound sample is selected, two attributes of a good sample, which are accuracy and precision, were highly considered. Because two categories of respondents were targeted in this study, probability and non-probability sampling methods were used, namely purposive sampling (non-probability) and simple random sampling (probability method). Purposive sampling was used to select members of staff of the district municipalities who were knowledgeable and involved in e-government service delivery (Group A of respondents). The simple random sampling method was used to select the potential

customers of e-government services in each selected district municipality (Group B of respondents). Reliability and validity issues were discussed and how reliability and validity were ensured in this research was also explained. To analyse the data from the survey, the SPSS was used. Chapter 6 presents and discusses the empirical findings.

CHAPTER 6: PRESENTATION OF EMPIRICAL FINDINGS AND DISCUSSION

6.1 INTRODUCTION

The purpose of the study as indicated in Chapter 1 was to investigate and compare the utilisation of e-government by the selected district municipalities both in South Africa and Rwanda. Chapter 1 provided an introduction and an overview of the entire study whilst Chapter 2 presented the review of literature on e-government and other related literature. Chapter 3 outlined furthermore the current situation of e-government development in both South Africa and Rwanda and highlighted the progress made by the two countries. Chapter 4 provided the theoretical framework for further understanding of the topic of the study, while Chapter 5 was devoted to the research methodology followed in this study. Chapter 6 presents and discusses in detail the results of the empirical study.

To analyse the data and to present the findings the researcher made use of statistical aids such as:

- Descriptive statistics;
- Kruskall-Wallis H test;
- One-way analysis of variance (ANOVA); and
- Multivariate analysis of variance (MANOVA).

In addition, column, pie and bar charts were used to present the data in a clear and simplified format.

6.2 DATA PRESENTATION AND ANALYSIS OF FINDINGS OF THE QUESTIONNAIRE

6.2.1 Response rate

As stated in Chapter 3, the study targeted 400 respondents who were adult citizens above 18 years of age. They were selected randomly from the four district municipalities in South Africa and Rwanda respectively, with 100 respondents from each of the four district municipalities. All 400 questionnaires were fully completed

and returned. This amounted to a 100% response rate. This high rate was achieved due to the kind assistance from the field assistants who assisted in the completion of the questionnaires.

6.2.2 Biographical information

The demographic data collected were about residence, gender, age group, level of education and estimated monthly income.

Table 6.1: Residence of respondents

Country	District municipality	Frequency	Percentage (%)
South Africa	Lejweleputswa	100	25
	Fezile Dabi	100	25
Rwanda	Kicukiro	100	25
	Kamonyi	100	25
Total		400	100

Table 6.1 shows that 100 respondents were selected in each district municipality and the total number of respondents from four district municipalities was 400. They were all black Africans living in different townships. No Caucasians, Indians, or Coloureds participated in the survey. This is because of the nature of the study (comparative study) and therefore the researcher wanted to compare people sharing the same characteristics and racial background.

Table 6.2: Gender of respondents

	South Africa				Rwanda					
	Lejweleputswa		FezileDabi		Kicukiro		Kamonyi			
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Male	39	39.0%	47	47 0%	52	52.0%	48	48 0%	186	47.0%
Female	61	61.0%	53	53 0%	48	48.0%	52	52 0%	214	53.0%
Total	100	100 0%	100	100.0%	100	100.0%	100	100.0%	400	100.0%

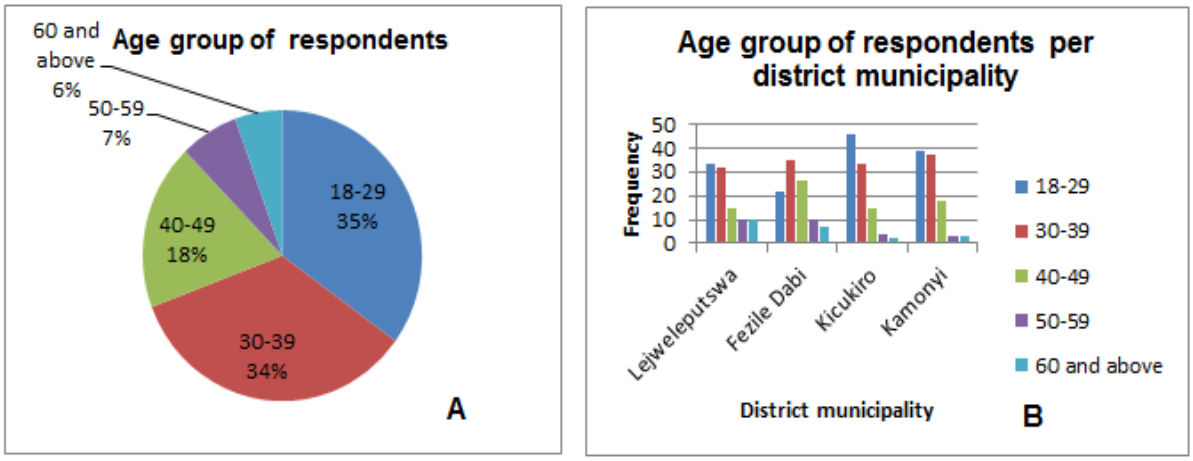
Table 6.2 shows that 53% of the respondents were females. These figures do somehow reflect the general population characteristics of the two countries. According to National Statistics of Rwanda (2014) females represent 51.8% while males represent 48.2% of the Rwandan population (http://www.statistics.gov.rw). In South Africa, the data from Statistics South Africa show that females represent 51.3% while males represent 48.7% (http://www.southafrica.info/about/people/.htm).

In addition, the fact that the survey was conducted during working days, males were absent from the townships as they were at work while females were present at home. According to Anon (2015: online), the unemployment rate is higher for women than for men. As a result of the social role attributed to females (role of mother) in most African countries, females stay at home taking care of the children while males are at work. There are also disparities between men and women in terms of the usage of ICT and e-government services in particular. According to the United Nations (2014: online), disparities exist in terms of access and usage of the internet by gender. Men have an edge over women and this digital divide is mostly observed in Africa. Furthermore, Anon (2015: online) indicates that as generally educational levels are lower for women than for men, their access opportunities to ICT and the internet in particular are likely to be lower. Again, the lack of income, social attitudes towards female usage of technology and a lack of internet content relative to women's needs limit female usage of ICT and e-government services.

Table 6.3: Age group of respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Age group of respondents	18-29	33	33.0%	22	22.0%	46	46.0%	39	39 0%	140	35.0%
	30-39	32	32.0%	35	35.0%	33	33.0%	37	37 0%	137	34.2%
	40-49	15	15.0%	26	26.0%	15	15.0%	18	18 0%	74	18.5%
	50-59	10	10.0%	10	10.0%	4	4 0%	3	3.0%	27	6.8%
	60 and above	10	10.0%	7	7.0%	2	2 0%	3	3.0%	22	5.5%
	Total	100	100.0%	100	100.0%	100	100.0%	100	100.0%	400	100.0%

The results of the age group of respondents are expanded more in Graph 6.1.



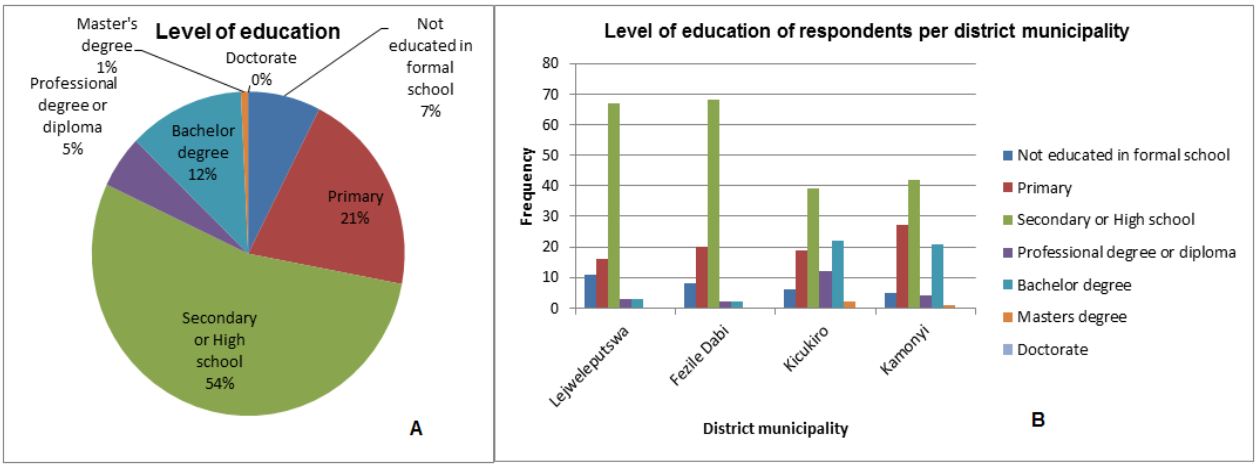
Graph 6 1: Age group of respondents (A -Age distribution of total sample; B – Age distribution per district municipality).

The results of Graph 6.1 show that the respondents were predominantly young (18-39 years) and a reasonable number were between 40 and 59 years of age whilst a very small number of respondents were 60 years of age and above. These figures do reflect exactly the national distribution of population per age in South Africa and in Rwanda where young people between 15 and 39 years are predominant (Stats SA, 2011 and National Institute of Statistics of Rwanda, 2014). In addition, Graph 6.1 shows that more young respondents were in the Kicukiro and Kamonyi district municipalities. Young people tend to offer intelligence, creative thinking and a valuable outlook on the world (Chetty 2015: 186). If employed, young people can work energetically and enthusiastically, therefore accelerating the development of the country. However, their contributions depend less on their numbers but most importantly on their knowledge and know-how (knowledge and skills). There is a relationship between the age of the population and the use of ICTs. According to Prince (2000:13), educated young people tend to adapt, integrate and use ICTs more than older people. In this context, the researcher might assume that e-government services are likely to be used by educated young people rather than by older people. Ease of use and usefulness of an innovation can be perceived easier by young educated people than older people. Both South Africa and Rwanda could count on their young population for future socio-economic development through ICT innovations, but with one condition: ICT literacy and quality education should be available for all people without any discrimination.

Table 6.4: Level of education of respondents

		South Africa				Rwanda					
		Lejweleputswa		FezileDabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Education level of respondents	Not educated in formal school	11	11 0%	8	8 0%	6	6 0%	5	5 0%	30	7 5%
	Primary	16	16 0%	20	20 0%	19	19 0%	27	27 0%	82	20 5%
	Secondary or high school	67	67 0%	68	68 0%	39	39 0%	42	42 0%	216	54 0%
	Professional or Technical degree (Diploma)	3	3 0%	2	2 0%	12	12 0%	4	4 0%	21	5 2%
	Bachelor Degree	3	3 0%	2	2 0%	22	22 0%	21	21 0%	48	12 0%
	Masters/MBA	0	0 0%	0	0 0%	2	2 0%	1	1 0%	3	0 8%
	Doctorate	0	0 0%	0	0 0%	0	0 0%	0	0 0%	0	0 0%
	Total	100	100.0%	100	100.0%	100	100.0%	100	100.0%	400	100.0%

The results of Table 6.4 are expanded in Graph 6.2 below



Graph 6.2: Educational level of respondents (A-Educational level of total sample; B- Educational level of the respondents per district municipality).

The results of Table 6.4 show the educational level of respondents. The district municipality of Kamonyi has the highest percentage of respondents who are not educated in formal school and who have only primary level. This is followed by Fezile Dabi and Lejweleputswa.

Furthermore, the results of Graph 6.2 show that the majority of respondents completed only primary and high school (75%). Respondents with high school

certificates were in Fezile Dabi and Lejweleputswa. Respondents with at least a Bachelor's and Master's degree were in the Kicukiro District municipality rather than other district municipalities. Overall, few respondents had a tertiary level of education (Bachelor's and Master's degree) and no respondent had a doctoral degree. After 1994 (end of Apartheid regime), the government of South Africa set up priorities to make South Africa a peaceful, democratic and strong country. Education, especially for marginalised Africans, was one of the priorities. Schools were built and many learners attended schools. However, until now the number of people in the African communities who managed to study to the highest educational level (Master's and doctorate) is still very small (Anon 2015: online). This situation is almost the opposite of the conditions in Rwanda after the 1994 war and the Tutsi genocide. Before 1994, few schools (primary, secondary, and universities) belonged to the government and the selection process was very unfair and discriminatory. After 1994, education was liberalised and many private schools (primary, secondary and universities) were founded by the private sector and there was strong competition between private schools. Therefore, many people attended private schools and a significant number completed Honours or Bachelor's degrees. However, people with Master's and doctoral degrees in Rwanda are still very few.

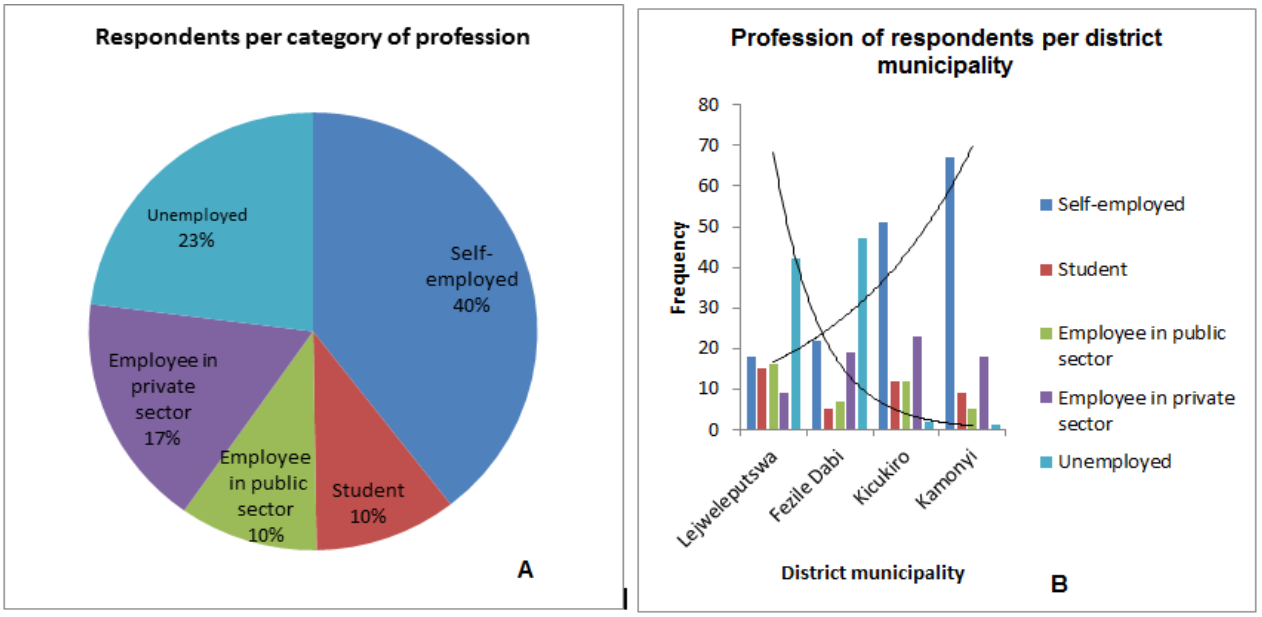
As previously indicated in Chapter 4, three types of knowledge, namely awareness-knowledge, how-to-knowledge and principles-knowledge are the preconditions for an individual to decide on the use of an innovation such as e-government services. The acquisition of this knowledge goes hand in hand with the educational level of an individual. Low-level education implies low capabilities to acquire the three types of knowledge and therefore leads to an individual's incapacity to adopt and utilise e-government services. In this regard, Prince (2000:12) argues that individuals with better education have higher rates of internet usage than others, while those with lower levels of education tend to show the least interest in learning to use the internet or going online. Furthermore, ITU (2014: 22) indicates that there is a strong correlation between education and literacy on the one hand, and the ability to use ICT on the other. Education is the most important determinant of internet use, which is why developed countries with a solid education and solid human resource base remain far ahead of others in terms of the use of e-government services.

Taking into consideration the educational level of respondents as shown in Table 6.4 it can be seen that the utilisation of e-government services by the respondents is likely to be at a lower level. In this regard, Montagnier and Wirthnann (2011) quoted (in Kumar *et al*. 2007:70) indicate in their research that the probability of an individual using e-government and the internet everyday increases 2.4 times in Europe and 3.6 times in the Republic of Korea if they have a university degree and above.

Table 6.5 : Profession of respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Profession of respondents	Self-employed	18	18 0%	22	22 0%	51	51 0%	67	67 0%	158	39 5%
	Student	15	15 0%	5	5 0%	12	12 0%	9	9 0%	41	10 2%
	Employee in public sector	16	16 0%	7	7 0%	12	12 0%	5	5 0%	40	10 0%
	Employee in private sector	9	9 0%	19	19 0%	23	23 0%	18	18 0%	69	17 2%
	Unemployed	42	42 0%	47	47 0%	2	2 0%	1	1 0%	92	23 0%
	Total	100	100.0%	100	100.0%	100	100.0%	100	100.0%	400	100.0%

The results of Table 6.5 show that the majority of respondents were self-employed or unemployed. The results of Table 6.5 are expanded in Graph 6.3.



Graph 6.3: Profession of respondents (A-Respondents per category of profession; B- Profession of respondents per district municipality).

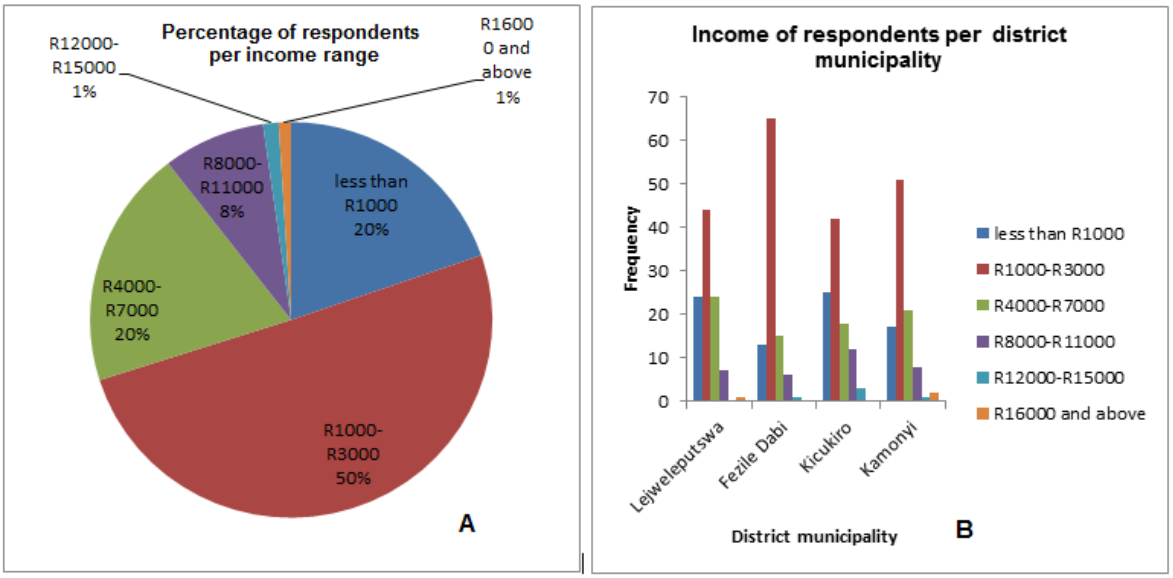
As shown by exponential trend lines in Graph 6.3, unemployed respondents were predominantly in the Fezile Dabi and Lejweleputswa district municipalities compared to Kicukiro and Kamonyi, whilst self-employed respondents were predominantly in Kamonyi and Kicukiro. The percentages of self-employed and unemployed respondents in Rwanda do reflect to some extent the official statistics on the unemployment rate. In Rwanda, the unemployment rate is 3.4% in general and at 13% for young graduates (Asaba 2015: online). The unemployment rate of just 3.4% generated intense debate and doubts about the accuracy of the data. However, 3.4% might reflect the reality if one considers that Rwanda is an agro-based economy as more than 80% of Rwandan people are engaged in subsistence farming. This majority of people (80%) who live from subsistence agriculture are considered as self-employed and contribute a lot to the decrease in the unemployment rate of Rwanda. To conclude, the researcher might say that the high percentage of self-employment and low percentage of unemployment in Rwanda are due to the fact that many people are subsistence farmers and many others are working in informal sectors. These trends are the total opposite in South Africa where the formal sector accounts for the largest share of employment at 69.2% whilst agriculture accounts for the lowest share at 5.6%. The unemployment rate in South Africa averaged 25.27% from 2000 to 2015 (Yekalerina 2015: online). Furthermore, according to Stats SA (in Yakalerina 2015: online) South Africa's working age population was at 36 million, with 15.7 million being employed, 5.2 million being unemployed and 15.1 million not being economically active.

There is a relationship between the type of profession and income generated on the one hand, and between income and access to and utilisation of ICT on the other hand. The researcher argues that those who are engaged in subsistence agriculture and those working in the informal sector gain a relatively low income and therefore cannot easily access and utilise ICT, especially the internet. In addition, because of the high unemployment rate in South Africa, (5.2 million unemployed plus 15.1 million not economically active) access to and utilisation of ICT especially the internet can be considered a luxury activity. In this context, Heeks (2002:14) argues that low income is one of the major barriers for African communities in South Africa to engage in the utilisation of ICT and the internet in particular.

Table 6.6: Monthly income of respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Estimated monthly income of respondents	Less than R1000	24	24.0%	13	13 0%	25	25.0%	17	17.0%	79	19.8%
	R 1000-R3000	44	44.0%	65	65 0%	42	42.0%	51	51.0%	202	50 5%
	R4000-R7000	24	24.0%	15	15 0%	18	18.0%	21	21.0%	78	19 5%
	R8000-R11000	7	7.0%	6	6 0%	12	12.0%	8	8.0%	33	8 2%
	R12 000-R15.000	0	0.0%	1	1 0%	3	3.0%	1	1.0%	5	1 2%
	R16 000 and above	1	1.0%	0	0 0%	0	0.0%	2	2.0%	3	0.8%
	Total	100	100 0%	100	100.0%	100	100.0%	100	100 0%	400	100.0%

The results of Table 6.6 show that the majority of respondents earn less than R1 000 and between R1 000 and R3 000 per month. Very few have a monthly income between R12 000 and R16 000. The results of Table 6.6 are explained in Graph 6.4.



Graph 6.4: Monthly income of respondents (A- Respondents per income range; B-income of respondents per district municipality).

The results of Graph 6.4 show that the respondents whose monthly income is less than R1 000 were in Kicukiro and Lejweleputswa rather than Kamonyi and Fezi Dabi. The explanation can be that Kicukiro and Lejweleputswa are considered urban areas where more unemployment cases are observed. Respondents whose monthly income is R1000-R3 000 were in FezileDabi and Kamonyi rather than Lejweleputswa and Kicukiro, whilst respondents earning between R12 000 and R15 000 were in Kicukiro and Fezile Dabi. Furthermore, Graph 6.4 (pie chart) indicates that 70% of respondents earn a monthly income of less than R1 000 and R1 000-R3 000. Only 2% earn a monthly income between R12 000 and R16 000.

Though the median salary in South Africa is estimated at R15 000 per month (Van Tonder 2013: online), the results of Table 6.6 show that the majority of respondents in Lejweleputswa and Fezile Dabi earn less than R1 000 and between R1 000 and R3 000 per month. During the field survey, it was found that the majority of those who earn between R1 000 and R3 000 are beneficiaries of social grants paid by the government via the South African Social Security Agency.

The results reflecting the monthly income of respondents as presented in Table 6.6 can be explained if linked with the utilisation of e-government services. According to Kroukamp (2005:62), half of the total spending in South Africa is directed towards food (22%), housing (14%), income tax (9%), and transport (10%). Other expenses are added to these major expenses, such as clothing and shoes, sports and leisure, school fees, etc. Taking into consideration the monthly income of the majority of the respondents and their monthly expenses, it can clearly be seen that not much is left for ICT-related expenditure.

With the constant rise of inflation it is difficult for average South Africans to make their income cover their monthly expenses and have extra money for the internet. This state of affairs is likely to affect the use of the internet as the internet is not considered a necessity but a luxury. In this regard, a study conducted in 18 countries in Europe found that low income was the most important barrier to acquiring basic technology. A high-income household is four times more likely to have access to a computer and the internet than a low-income household (Kumar *et al*. 2007:69). In addition, a study in the United States showed that one in five American adults who

do not use the internet are most likely to be an individual earning less than US $30,000 per year (UN 2014: 123).

6.2.3 Computer literacy and internet proficiency

Variables considered were:

- English and French literacy level;
- Computer literacy and access to the computer; and
- Internet literacy and access to the internet.

6.2.3.1 English and French literacy

Generally, for an individual to use e-government services, one needs to know how to use a computer and the internet in particular. In addition, the individual needs to have the knowledge and the ability to use at least one language among the most used languages on global information networks. In this regard, Kumar *et al*. (2007: 71) argue that the first step to being ICT literate in today's information age is to have a certain level of internet language literacy, especially English. According to the United Nations (2014: 133), the most used languages on global information networks are five. Those five languages are presented in the Table 6.7.

Table 6.7: Percentage of internet users by language.

Language	Percentage of internet users by language	Percentage of content on the internet
English	27	56
Chinese	25	4
Spanish	8	4
German	4	6
French	3	4

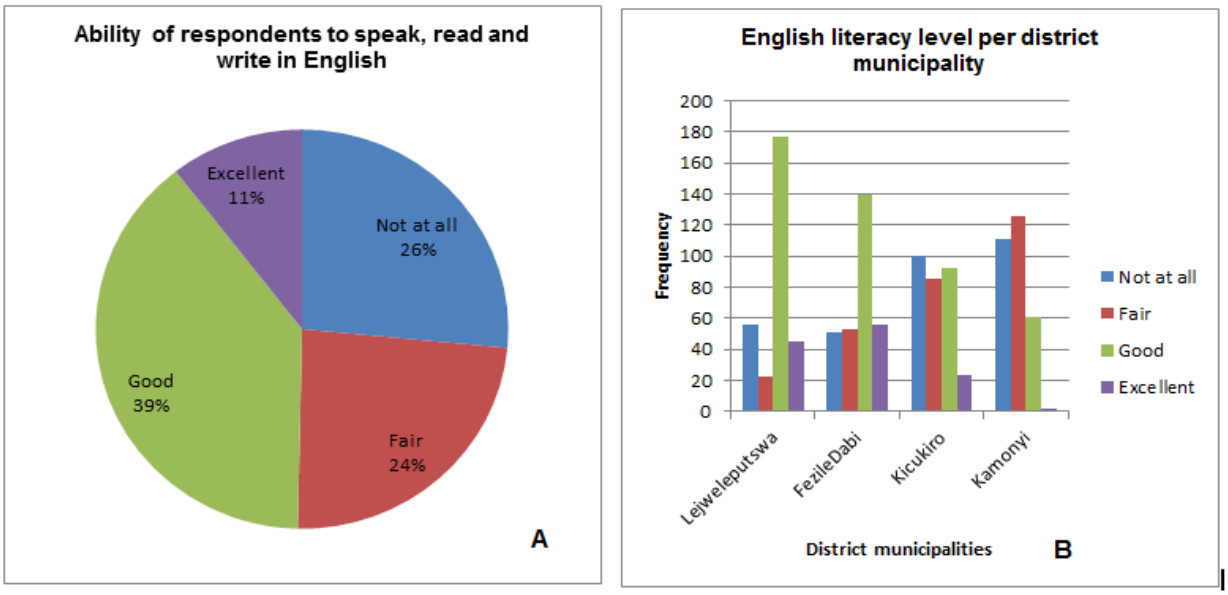
Source: Adapted from United Nations e-government survey (2014).

The knowledge and the ability of respondents to speak, write and read English and French were investigated. The results are presented in Tables 6.8 and 6.9.

Table 6.8: English literacy level of respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Ability to understand and communicate in English	Not at all	19	19.0%	17	17.0%	34	34 0%	37	37.0%	107	26.8%
	Fair	8	8.0%	18	18.0%	31	31 0%	42	42.0%	99	24.8%
	Good	59	59.0%	47	47.0%	28	28 0%	21	21.0%	155	38.8%
	Excellent	14	14.0%	18	18.0%	7	7.0%	0	0.0%	39	9.8%
Ability to read in English	Not at all	18	18.0%	16	16.0%	33	33 0%	37	37.0%	104	26.0%
	Fair	6	6.0%	18	18.0%	27	27 0%	42	42.0%	93	23.2%
	Good	60	60.0%	47	47.0%	32	32 0%	20	20.0%	159	39.8%
	Excellent	16	16.0%	19	19.0%	8	8.0%	1	1.0%	44	11.0%
Ability to write in English	Not at all	19	19.0%	18	18.0%	33	33 0%	37	37.0%	107	26.8%
	Fair	8	8.0%	17	17.0%	27	27 0%	42	42.0%	94	23.5%
	Good	58	58.0%	46	46.0%	32	32 0%	20	20.0%	156	39.0%
	Excellent	15	15.0%	19	19.0%	8	8.0%	1	1.0%	43	10.8%

Overall, the results of Table 6.8 indicate that the respondents have difficulty understanding and communicating in English rather than reading and writing in English. The results of Graph 6.5 expand more on the results of Table 6.8



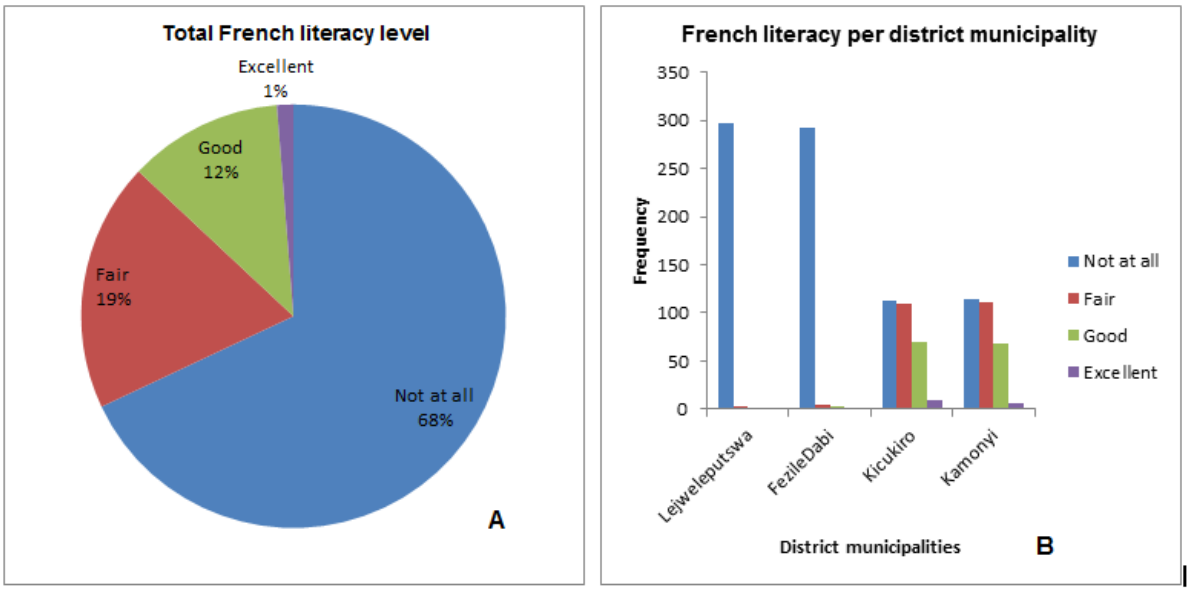
Graph 6.5: English literacy level of the respondents (A-Total English literacy; B-English literacy level per district municipality)

The results of Table 6.8 as expanded in Graph 6.5 show that the English literacy level is higher in South Africa than in Rwanda. Lejweleputswa has the highest number of respondents who are good and excellent compared to other district municipalities, whilst Kamonyi has a lowest level of English literacy. Overall, the results as shown in Graph 6.5 (pie chart) indicate that 50% of respondents are almost English illiterate. Therefore, they do not have access to internet content presented in English. This is a big challenge as long as 56% of the content on the internet is presented in English (see Table 6.7). In this regard, De Beer and Mokhele (2004:69) argue that the use of the internet is difficult for most rural people who have limited resources and who are English illiterate. One is very unlikely to be an internet user if one cannot easily read or write in English, if one is very poor and unemployed. On the other side, one is very likely to be an internet user if one can easily read and write English. In addition, Anon (2015: online) argues that unless users have knowledge of the English language, regardless of how good electronic translators may become, they will be barred from a vast reservoir of information available in the world of internet.

Table 6.9: French literacy level of respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Ability to understand and communicate in French	Not at all	99	99 0%	98	98 0%	36	36.0%	38	38.0%	271	67.8%
	Fair	1	1.0%	1	1.0%	39	39.0%	37	37.0%	78	19.5%
	Good	0	0.0%	1	1.0%	22	22.0%	23	23.0%	46	11.5%
	Excellent	0	0.0%	0	0.0%	3	3.0%	2	2 0%	5	1 2%
Ability to read in French	Not at all	99	99 0%	97	97 0%	38	38.0%	38	38.0%	272	68.0%
	Fair	1	1.0%	2	2.0%	35	35.0%	37	37.0%	75	18.8%
	Good	0	0.0%	1	1.0%	24	24.0%	23	23.0%	48	12.0%
	Excellent	0	0.0%	0	0.0%	3	3.0%	2	2 0%	5	1 2%
Ability to write in French	Not at all	99	99 0%	97	97 0%	38	38.0%	38	38.4%	272	68.2%
	Fair	1	1.0%	2	2.0%	35	35.0%	37	37.4%	75	18.8%
	Good	0	0.0%	1	1.0%	24	24.0%	22	22.2%	47	11.8%
	Excellent	0	0.0%	0	0.0%	3	3.0%	2	2 0%	5	1.3%

The results of Table 6.9 show that French illiteracy is much lower in Rwanda than in South Africa. This is because Rwanda has been a French speaking country for more than 40 years while English was only introduced as an official language in 1994. However, as can be seen from Table 6.9 the number of respondents in Rwanda who are excellent in French is minimal (almost 3%). As far as English and French literacy is concerned, the researcher argues that the district municipalities in Rwanda have more challenges than district municipalities in South Africa. The results (see Tables 6.8 and 6.9) show that a majority of the respondents from the two districts in Rwanda do not master any of the two most used internet languages. The results of Table 6.9 are expanded more in Graph 6.6.



Graph 6.6: French literacy level of the respondents (A-Total French literacy; B-French literacy level per district municipality).

The results of Graph 6.6 show that, despite the fact that French literacy level is generally low for almost all district municipalities, the Kicukiro district municipality has a certain number of respondents who are good and excellent in speaking, writing and reading French compared to other district municipalities. The results further show that almost all respondents in South Africa cannot speak, write or read French. This is not as big an issue as only 4% of the internet is presented in French (see Table 6.7).

Though knowing more than one language among the most used languages on the internet opens up opportunities to have access to a vast reservoir of information, it can be seen that the level of knowledge and the ability of respondents to utilise the most used languages on the internet are overall low for the majority of the respondents, and very low for the respondents in Rwanda. In this regard, Bernard and Patel (2003:41) argue that the inability to use one's own language on global information networks affects the capability of the population to avail themselves of the benefits of e-government. To overcome this barrier the government should make sure that English is taught to all people and ensure that at least public information posted on the government's websites is presented in local languages. Online services and government's information should be provided in more than one language and citizens should be given options to use more than one language

including mother tongue when they visit the government's websites and the district municipalities' websites in particular.

6.2.3.2 Computer literacy and access to the computer

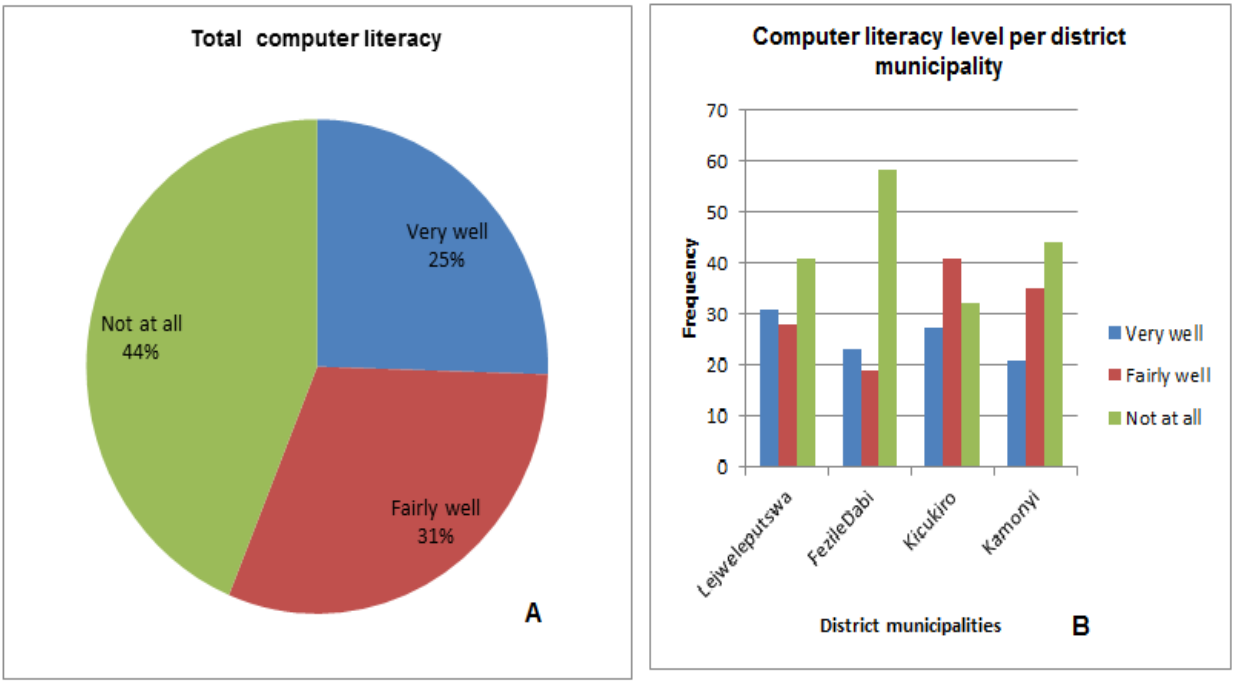
Having the skills to use a computer is one of the factors which may determine the use of the internet and therefore the use of online services. However, it makes no sense if computer skills are present but there is no computer access. Computer literacy and access to the computer go hand-in-hand.

Table 6.10: Skills to use a computer and access to a computer

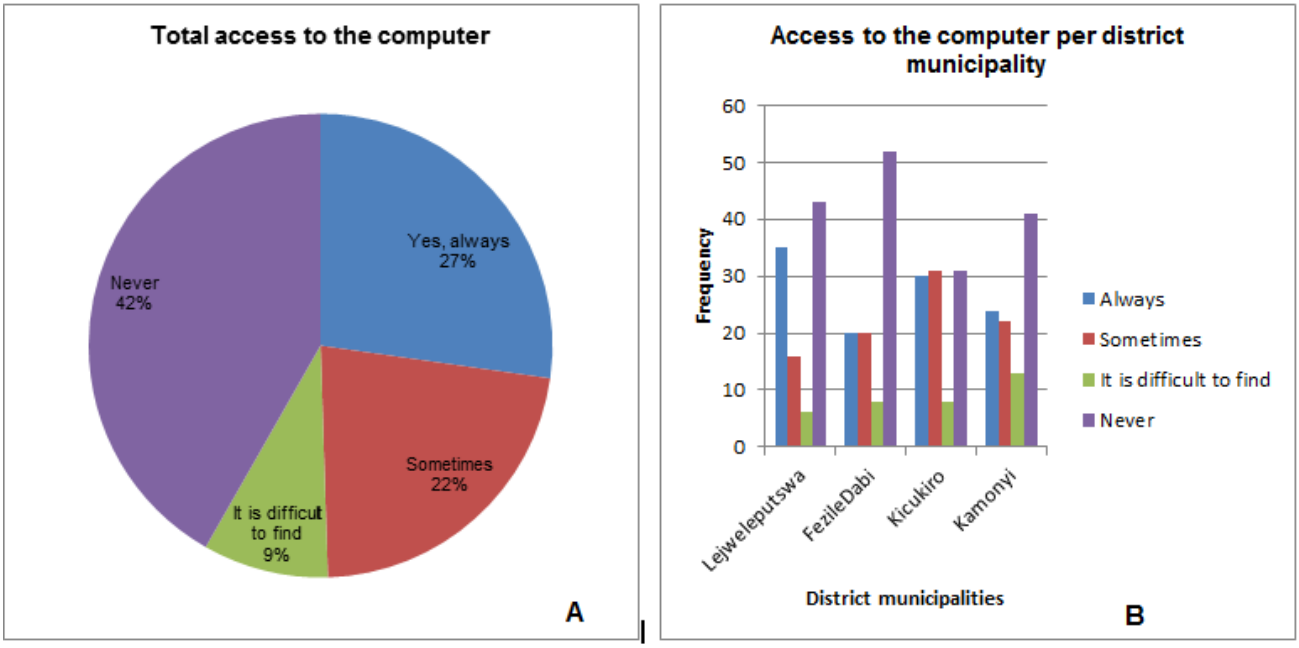
		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
How well can you manipulate and use the computer (desktop or laptop)?	Very well	31	31 0%	23	23.0%	27	27.0%	21	21.0%	102	25.5%
	Fairly well	28	28 0%	19	19.0%	41	41.0%	35	35.0%	123	33.2%
	Not at all	41	41 0%	58	58.0%	32	32.0%	44	44.0%	175	41.2%
Do you have access to the computer (desktop or laptop) whenever you need it?	Yes, always	35	35 0%	20	20.0%	30	30.0%	24	24.0%	109	27.2%
	Sometimes	16	16 0%	20	20.0%	31	31.0%	22	22.0%	89	22.2%
	t is difficult to find	6	6.0%	8	8.0%	8	8.0%	13	13.0%	35	8.8%
	Never	43	43 0%	52	52.0%	31	31.0%	41	41.0%	167	41.8%

The results of Table 6.10 show that computer literacy is low in Fezile Dabi, followed by Kamonyi and Lejweleputswa. The level of access to a computer is also low in Fezile Dabi, followed by Lejweleputswa and Kamonyi. The Kicukiro district municipality is much better than the other three district municipalities in terms of computer literacy and access to a computer. More details are presented in Graph 6.7.

The results of Graph 6.7 on computer literacy show that the Lejweleputswa district municipality has the highest number of respondents who know how to use a computer, followed by Kicukiro, Fezile Dabi and lastly the Kamonyi district. The Kamonyi district municipality has the highest number of respondents who do not know how to use a computer, followed by Fezile Dabi. This can be explained by the fact that these two district municipalities are located in semi-urban areas.



Graph 6.7: Computer literacy level of respondents (A-Total computer literacy; B-computer literacy level per district municipality).



Graph 6.8: Access to the computer (A-Total access to a computer; B- access to a computer per district municipality.

Furthermore, the results as presented in Graph 6.7 (pie chart) show that overall a significant number of respondents (75%) do not know how to use a computer, 44% do not know anything about a computer and 31% know how to manipulate a computer fairly well. It means that almost 75% of respondents do not have enough knowledge and skills to manipulate a computer and therefore cannot benefit from e-government services. In this regard, Moon and Norris (2005:53) argue that a person will not arrive at an intention to use e-government services, which requires computer knowledge and skills, unless that person has gained competence from the experience using a computer.

The results of Graph 6.8 on access to the computer indicate that the Fezile Dabi district municipality has the highest number of respondents who do not have access to a computer, followed by Lejweleputswa and Kamonyi. Graph 6.8 also shows that Lejweleputswa has the highest number of respondents who always have access to a computer either at home, work, cybercafé, public libraries and schools, or at MPCCs, whilst Fezile Dabi has the smallest number of respondents who have easy access to a computer. Overall, the results of Graph 6.8 (pie chart) show that more than 50% of respondents do not have easy access to the computer and therefore cannot easily use online public information and services. According to Duff (2014: online), only

9.8% of households in South Africa had computers at home in 2012, and this number increased to 10% in 2014. Gauteng was the province with the highest number of people (21.1%) who have computers at home. In Rwanda, households with computers at home were only 2% in 2012. However, it was 13% in the capital city of Kigali and 1% in rural areas (Rwanda National Institute of Statistics, 2012). Having access to a computer at home is still a challenge for the citizens of both South Africa and Rwanda, but it is a bigger challenge for the citizens of Rwanda because only 2% have a computer at home. To overcome this barrier, strategies have been put in place by the GoR, one of which was to decrease the purchasing cost of a computer by making the importation of computers to Rwanda tax free (0%).

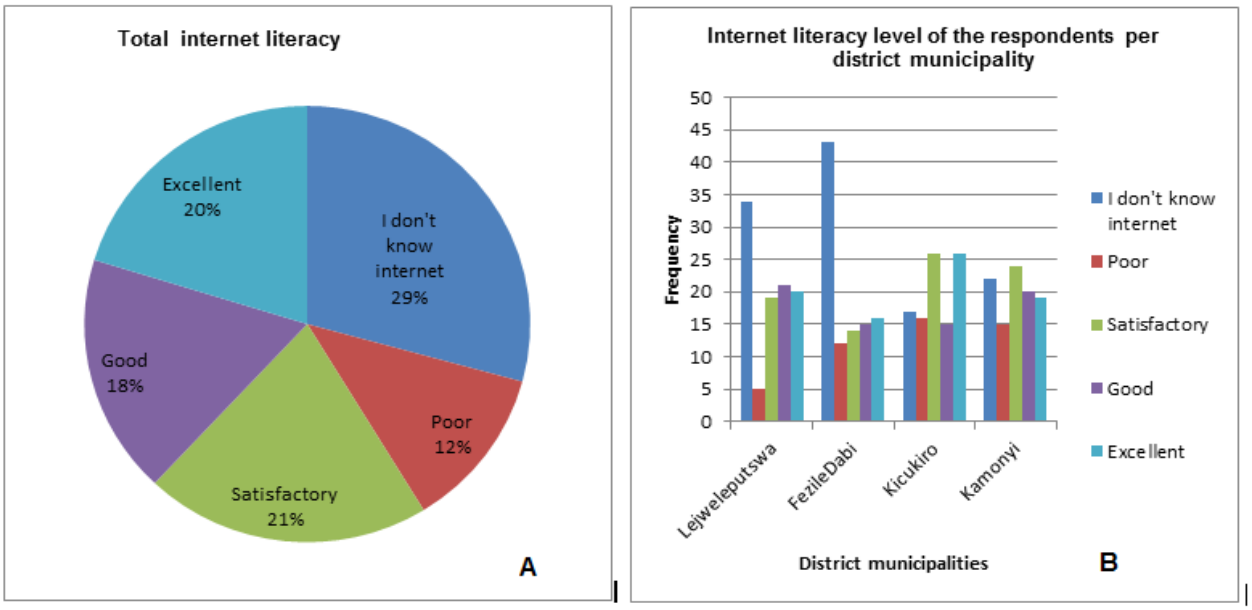
6.2.3.3 Internet literacy and access to the internet

Having the skills to use the internet and easy access to the internet are preconditions for the utilisation of online information and services provided by the district municipalities. Knowledge of the internet is directly and positively linked with the intention to use the internet. The intention to use the internet leads to the intention to search and utilise online information and services.

Table 6.11: Internet literacy and access to the internet

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
How good is your knowledge of how to use the internet?	I don't know what internet is	35	34.3%	43	43.0%	17	17.0%	22	22.0%	117	29.1%
	Poor	5	5.1%	12	12.0%	16	16.0%	15	15.0%	48	12.0%
	Satisfactory	19	19.2%	14	14.0%	26	26.0%	24	24.0%	83	20.8%
	Good	21	21.2%	15	15.0%	15	15.0%	20	20.0%	71	17.8%
	Excellent	20	20.2%	16	16.0%	26	26.0%	19	19.0%	81	20.3%
How do you access the internet when you need it?	I don't need the internet	27	29.3%	37	39.8%	30	30.0%	32	32.0%	126	32.7%
	I use my mobile phone	45	45.0%	44	44.4%	29	29.0%	27	27.0%	145	37.6%
	I use my smart phone	12	13.2%	11	11.8%	12	12.0%	20	20.0%	55	14.2%
	I use my tablet	4	4.4%	1	1.1%	7	7.0%	0	0.0%	12	3.1%
	I use my laptop at the office or modem at home	8	8.8%	7	7.0%	18	18.0%	17	17.0%	50	12.9%
	I use modem on the desktop computer at home	2	2.2%	0	0.0%	0	0.0%	0	0.0%	2	2.2%
	I use the desktop at the office	12	12.9%	4	4.3%	6	6.4%	1	1.0%	23	6.1%
	I use the desktop at school	4	4.3%	1	1.0%	10	10.0%	1	1.0%	16	4.2%
	I go to the cyber-café	6	6.4%	7	7.4%	8	8.4%	2	2.2%	23	6.1%
	I go to the Community Tele-Centre	9	9.6%	1	1.1%	2	2.2%	1	1.0%	12	3.2%

The results of Table 6.11 show that internet literacy was fairly high in Lejweleputswa and Kicukiro, whilst low in Kamonyi and Fezile Dabi. The results of Table 6.11 are expanded in Graph 6.9.

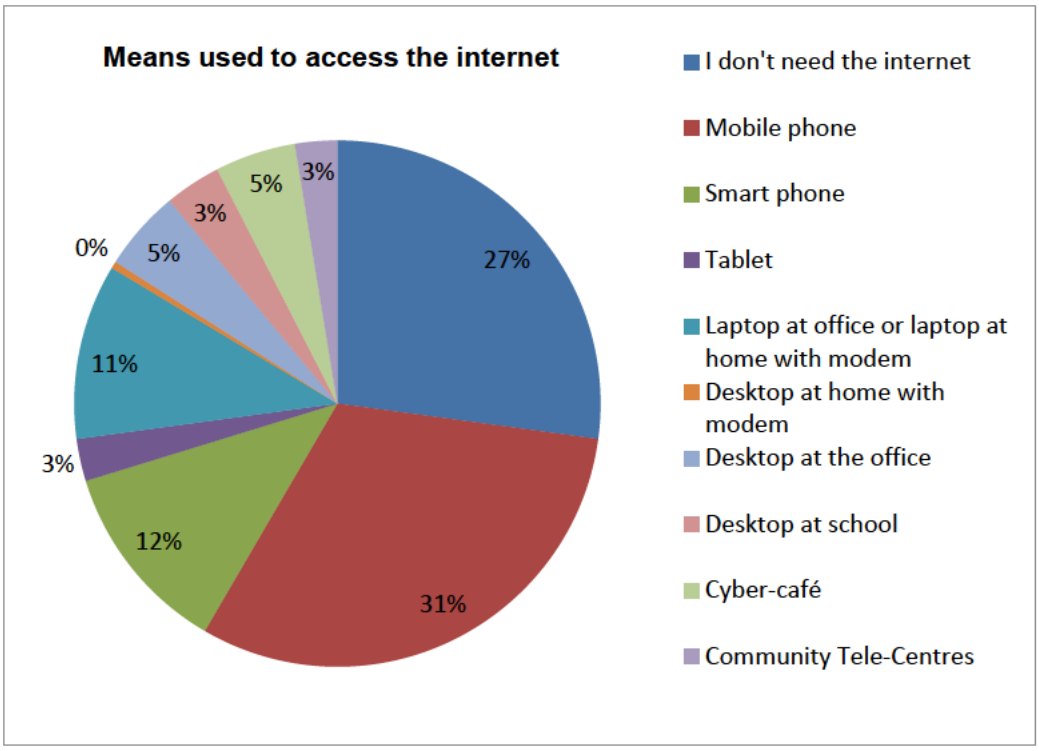


Graph 6.9: Level of internet literacy of the respondents (A-Total internet literacy; B-Internet literacy per district municipality).

The results of Table 6.11 show that the Fezile Dabi district municipality has the highest number of respondents who do not know what the internet is, followed by Lejweleputswa and Kamonyi. The respondents with good and excellent knowledge about the internet were in Kicukiro and Lejweleputswa. These two district municipalities are considered more urban compared to the other two districts. Overall, the results of Graph 6.9 (pie chart) show that 29% of the respondents do not know anything about the internet and 12% have poor knowledge. Poor knowledge means that they have heard about the internet but they do not know how to use it. Only 20% of the respondents know the internet very well, can use it and advance further.

Without sufficient knowledge of the internet, it is difficult to use it for e-government services. Official statistics from Stats SA show that in 2012, 40.6% of households in South Africa had at least one member who used the internet either at home, at the workplace, at school, at a cybercafé or community tele-centre, and this number increased to 40.9% in 2014. In the Free State province, the statistics show that

39.7% have access to the internet from anywhere (workplaces, schools, public libraries, cybercafé, and MPCCs) whilst only 6.9% can access the internet from their homes (Duff, 2014: online). In Rwanda, the data from the households' census of 2011 showed that only 3.7% of households have access to the internet from their homes, but this number increased to 9.3% in 2014 (Niyomwungeri 2015:online). Access to the internet is not enough to be able to use e-government services effectively. The tools or devices used to access the internet do matter. For instance, access to online government information and services using small and ordinary simple mobile phones is not easy.



Graph 6.10: Means used by respondents to access the internet

The results of Graph 6.10 indicate that a significant percentage of respondents (27%) think they do not need the internet. 27 percent declared not to know anything about the internet (see Graph 6.9). A predominant number of respondents (31%) have access to the internet *via* small ordinary mobile phones, 12 percent utilise smartphones, 11 percent utilise laptops at the office, whilst only 3 percent utilise tablets to access the internet. None of the respondents have a computer with an internet connection on a regular basis at home. In addition, the results show that public places such as cybercafé, MPCCs, public libraries and schools are not often frequented by the respondents for internet access. According to Stats SA (in Duff,

2014: online), access to the internet at home in 2014 was 16.4% in metropolitan areas, 2% in rural areas and 9.2% in urban areas. About 41% of all South Africans are internet users and more than 30.8% access the internet via mobile devices. However, the number of internet users in rural areas is limited to 17.9% and the majority of them utilise small ordinary mobile phones for internet connection (Duff, 2014: online). In Rwanda, the percentage of internet users was 28% in 2014 of which 36% were in the urban areas of Kigali and only 4% in rural areas. More than 75% utilised their mobile devices to access the internet (Niyomwungeri 2015: online).

Mobile devices such as mobile phones and smartphones are mostly used for access to the internet. However, they limit users in terms of help, use and access to e-government services. For instance, downloading, filling in a form and uploading can be hard to do on a hand-held device. In addition, Basu (2004:108) indicates that some websites do not allow mobile or smartphone utilisation, therefore these websites cannot be accessed, or if they are, cannot show all the content.

6.2.3.4 Skills of respondents to utilise a computer and the internet for e-government services

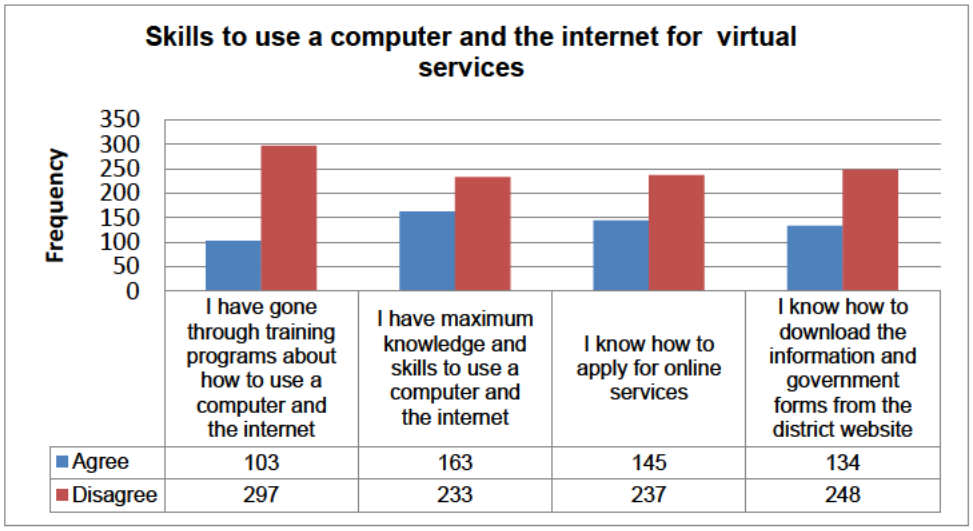
In the absence of minimum experience of computer and internet use, the ordinary citizen will not arrive at an intention to use e-government services. Computer and internet self-efficacy is one of the prerequisites necessary to make optimal use of online services. The results of Table 6.12 show whether the respondents who admitted to knowing how to use a computer (see Table 6.9) and the internet (see Table 6.10) have enough knowledge and skills to manipulate a computer and the internet for acquiring e-government services.

For example, do they know how to download a form, complete a form and search for information on the government websites? Do they know how to write and send an e-mail to the district municipality officials? These are some of the key concerns raised in the study.

Table 6.12: Skills of respondents to use a computer and internet for e-government services

		South Africa				Rwanda							
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi					
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies		Total percentages	
I have gone through formal training programs about how to use a computer and the internet	Strongly Agree	10	10.0%	8	8.0%	14	14.0%	9	9.0%	41	103	10.20%	25.7%
	Agree	17	17.0%	12	12.0%	15	15.0%	18	18.0%	62		15.50%	
	Neither Agree nor Disagree	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0		0.00%	
	Disagree	32	32.0%	33	33.0%	43	43.0%	55	55.0%	163	297	40.80%	74.3%
	Strongly Disagree	41	41.0%	47	47.0%	28	28.0%	18	18.0%	134		33.5	
I have maximum knowledge and skills to use a computer and the internet	Strongly Agree	2	2.0%	7	7.0%	10	10.0%	11	11.0%	30	163	7.50%	40.7%
	Agree	41	41.0%	23	23.0%	46	46.0%	23	23.0%	133		33.20%	
	Neither Agree nor Disagree	3	3.0%	0	0.0%	1	1.0%	0	0.0%	4		1.00%	
	Disagree	25	25.0%	38	38.0%	27	27.0%	48	48.0%	138	233	34.50%	58.3%
	Strongly Disagree	29	29.0%	32	32.0%	16	16.0%	18	18.0%	95		23.80%	
I know how to apply for online services	Strongly Agree	2	2.0%	7	7.0%	10	10.0%	9	9.1%	28	145	7.00%	36.3%
	Agree	43	43.0%	22	22.0%	32	32.0%	20	20.2%	117		29.30%	
	Neither Agree nor Disagree	2	2.0%	0	0.0%	8	8.0%	7	7.1%	17		4.30%	
	Disagree	24	24.0%	40	40.0%	23	23.0%	46	46.5%	133	237	33.30%	59.4%
	Strongly Disagree	29	29.0%	31	31.0%	27	27.0%	17	17.2%	104		26.10%	
I know how to download the information and government forms from the district website(s)	Strongly Agree	4	4.0%	8	8.0%	5	5.0%	7	7.1%	24	134	6.00%	33.6%
	Agree	46	46.0%	21	21.0%	26	26.0%	17	17.2%	110		27.60%	
	Neither Agree nor Disagree	2	2.0%	1	1.0%	9	9.0%	5	5.1%	17		4.30%	
	Disagree	20	20.0%	37	37.0%	31	31.0%	51	51.5%	139	248	34.80%	62.1%
	Strongly Disagree	28	28.0%	33	33.0%	29	29.0%	19	19.2%	109		27.30%	

The results of Table 6.12 show that the respondents from Lejweleputswa have more skills to use a computer and the internet for e-government purposes than other district municipalities. It is followed by Kicukiro, Fezile Dabi and lastly Kamonyi. In the Kamonyi district municipality, the majority of respondents who admitted to knowing how to use a computer and the internet do not know how to download a form and how to apply for online services. Overall, Graph 6.11 presents the results of the skills of the respondents to use a computer and the internet to acquire online information and services.



Graph 6.11: Skills of respondents to use a computer and the internet to acquire online services

The results of Graph 6.11 show that the skills level of respondents to use a computer and the internet for e-government services is very low. The reason is that many (297 respondents out of 400) did not receive any formal training on how to use a computer and the internet. Only 103 respondents out of 400 agreed that they received training on how to manipulate or utilise a computer and the internet. During the survey in the field one respondent said: "*No one trained me on how to manipulate a computer and how to use the internet. I trained myself and now I know the computer because I can type a letter on the computer and I can check my bank account statement and I can even read online news using my mobile phone. Therefore, I have maximum knowledge and skills to manipulate a computer and to use the internet*". Based on this statement it can be argued that many respondents believed that they had the skills to use a computer and the internet while they did not know how to search for government information on the websites, how to apply for

online services and how to download forms, fill them in and submit them *via* the internet. Training is needed for those respondents who admitted to not having any knowledge about a computer and the internet, but training is also needed in how to acquire online information and services from the government's websites for those who admitted to having knowledge and skills to use a computer and the internet.

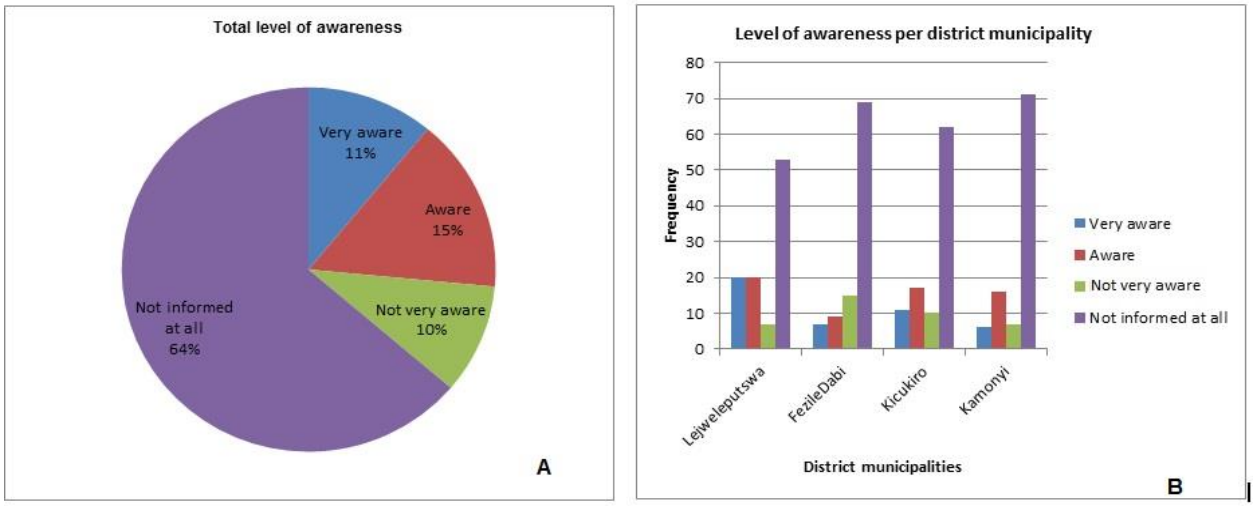
6.2.4 Level of awareness of the existence of the district municipalities' websites and available e-government services

As mentioned in Chapter four, the innovation-decision process starts first and foremost with the awareness stage. It is difficult for an individual to adopt an innovation that they are not aware of. However, governments often spend a large amount of money ensuring that online information and services are available for citizens' use, but are less willing to spend more on promoting awareness of available online services (Mpinganjira 2012: 504). The following table and graph show the respondents' level of awareness of the existence of district municipalities' websites.

The results of Table 6.13 show that the level of awareness is very low, where 73.5 percent of the respondents are not aware of the existence of the district municipalities' websites. The results of Table 6.13 are summarised in Graph 6.12.

Table 6.13: Level of awareness of the existence of the district municipality website

		South Africa			Rwanda							
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi				
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies		Total percentages	
How aware are you of the existence of the website (s) of your district municipality?	Very aware	20	20.0%	7	7.0%	11	11.0%	6	6.0%	44	106	11.0%	26.5%
	Aware	20	20.0%	9	9.0%	17	17.0%	16	16.0%	62		15.5%	
	Not so aware	7	7.0%	15	15.0%	10	10.0%	7	7.0%	39	294	9.8%	73.5%
	Not informed at all	53	53.0%	69	69.0%	62	62.0%	71	71.0%	255		63.8%	
If aware, to what extent do you agree or disagree with the following statements?													
I know the benefits of using the district e-government website (s)	Strongly Agree	4	4.0%	3	3.0%	8	8.0%	5	5.0%	20	110		
	Agree	22	22.0%	19	19.0%	24	24.0%	25	25.0%	90		23.0%	
	Neither Agree nor Disagree	7	7.0%	2	2.0%	16	16.0%	6	6.0%	31		7.8%	
	Disagree	33	33.0%	45	45.0%	28	28.0%	48	48.0%	154	259		
	Strongly Disagree	34	34.0%	31	31.0%	24	24.0%	16	16.0%	105		64.7%	
I am aware of the reason (s) why the district municipality decided to use e-government	Strongly Agree	4	4.0%	4	4.0%	9	9.0%	5	5.0%	22	96		
	Agree	13	13.0%	8	8.0%	29	29.0%	24	24.0%	74		24.0%	
	Neither Agree nor Disagree	7	7.0%	6	6.0%	15	15.0%	6	6.0%	34		8.5%	
	Disagree	39	39.0%	52	52.0%	25	25.0%	49	49.0%	165	270		
	Strongly Disagree	37	37.0%	30	30.0%	22	22.0%	16	16.0%	105		67.4%	
I am aware of online information and services available on the district municipality's website (s)	Strongly Agree	1	1.0%	3	3.0%	10	10.0%	2	2.0%	16	63		
	Agree	21	21.0%	9	9.0%	10	10.0%	7	7.0%	47		15.8%	
	Neither Agree nor Disagree	8	8.0%	6	6.0%	14	14.0%	6	6.0%	34		8.5%	
	Disagree	39	39.0%	48	48.0%	28	28.0%	52	52.0%	167	303		
	Strongly Disagree	31	31.0%	34	34.0%	38	38.0%	33	33.0%	136		75.8%	



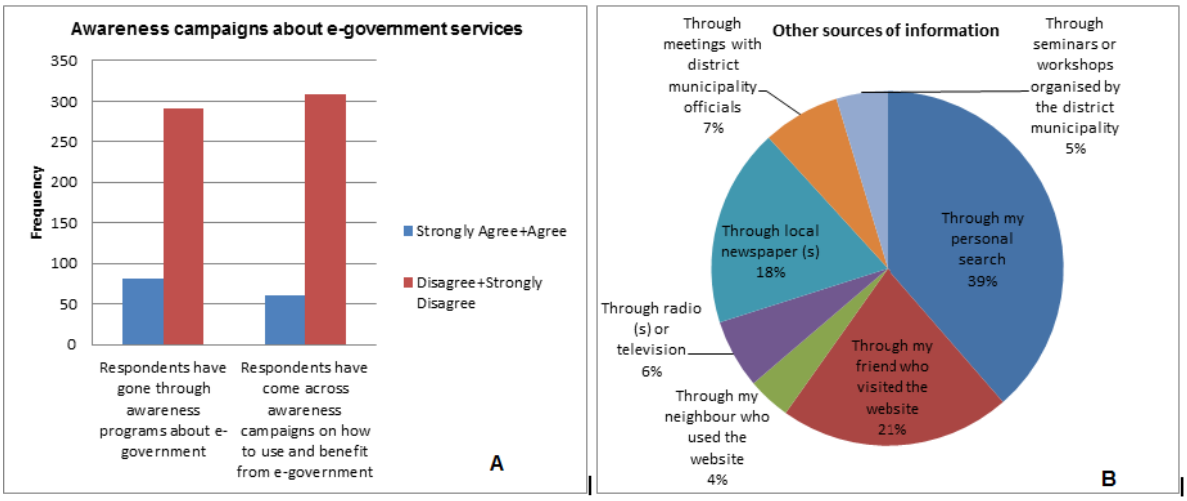
Graph 6.12: Level of awareness of the existence of district municipality website (A-Total level of awareness; B- Level of awareness per district municipality)

The results of Graph 6.12 show that 26 percent are very aware and aware of the existence of the district municipality's website whilst 74 percent are not aware. However, the results of Table 6.13 further indicate that the level of awareness is very limited even for the 26 percent who said they are aware of the existence of the district municipality's website. This is because the majority of them said that they do not know the benefits of using the district municipality's website (64.7%), and they are not aware of online information and services available on the district municipality's website (75.8%). As a result of this state of affairs, people will continue making long queues at the district municipality offices waiting for information and services, while the same information and services can be obtained via district municipality websites. In addition, municipality officials will continue to be overloaded by unnecessary activities. Based on the figures in the Table 6.13, the quality and quantity of the information received by those respondents who said they are aware of the existence of the district municipality's website, could be disputed as they are not aware of the benefits and content available on the district municipality's website. Therefore, to examine the issue of awareness further, the study investigated the sources of information because comprehensive awareness involves the quality and quantity of information an individual receives.

Table 6.14: Awareness campaigns on the utilisation of e-government services

		South Africa				Rwanda							
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi					
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies		Total percentages	
I have gone through awareness programs about e-government	Strongly Agree	3	3.0%	2	2.0%	8	8.0%	0	0.0%	13	81	3.2%	20.2%
	Agree	24	24.0%	21	21.0%	13	13.0%	10	10.0%	68		17.0%	
	Neither Agree nor Disagree	6	6.0%	3	3.0%	13	13.0%	6	6.0%	28		7.00%	
	Disagree	32	32.0%	41	41.0%	40	40.0%	66	66.0%	179	291	44.8%	72.8%
	Strongly Disagree	35	35.0%	33	33.0%	26	26.0%	18	18.0%	112		28.0%	
I have come across awareness campaigns on how to use and benefit from e-government	Strongly Agree	2	2.0%	3	3.0%	8	8.0%	4	4.0%	17	61	4.2%	15.2%
	Agree	17	17.0%	8	8.0%	10	10.0%	9	9.0%	44		11.0%	
	Neither Agree nor Disagree	6	6.0%	9	9.0%	12	12.0%	4	4.0%	31		7.80%	
	Disagree	40	40.0%	49	49.0%	33	33.0%	52	52.0%	174	308	43.5%	77.0%
	Strongly Disagree	35	35.0%	31	31.0%	37	37.0%	31	31.0%	134		33.5%	
Other sources of information:	Through my personal search	16	36.4%	10	34.5%	13	37.1%	10	43.5%	49		37.4%	
	Through my friend who visited the district's website	9	20.5%	7	24.1%	6	17.1%	5	21.7%	27		20.6%	
	Through my neighbour who used the website	2	4.5%	2	6.9%	1	2.9%	0	0.0%	5		3.8%	
	Through radio (s) or television (s)	0	0.0%	2	6.9%	5	14.3%	1	4.3%	8		6.1%	
	Through local newspaper (s)	4	9.1%	5	17.2%	7	20.0%	7	30.4%	23		17.6%	
	Through meetings with district municipality officials	4	9.1%	2	6.9%	3	8.6%	0	0.0%	9		6.9%	
	Through seminars or workshops organised by the district municipality	6	13.6%	0	0.0%	0	0.0%	0	0.0%	6		4.6%	

Overall, the results of Table 6.14 indicate that the information received about e-government was not complete because the source of information was not reliable. The results of Table 6.14 are expanded in Graph 6.13.



Graph 6.13: Awareness campaigns about e-government services (A-Awareness campaigns received; B- Other sources of information)

The results of Graph 6.13 show that the majority of respondents did not benefit from any awareness campaign regarding e-government in general nor the existence of the district municipality website in particular.

The results of Graph 6.13 (pie chart) show that 39 percent of the respondents knew that the website of the district municipality existed through their personal search. 25 percent were informed either by friends or neighbours and 18 percent received information from local newspapers. The researcher assumes that these sources of information are not reliable enough to provide quality and quality information. They are not sufficient to provide an individual with 3 types of knowledge (awareness-knowledge, know how-knowledge and principles-knowledge) which are needed for an individual to have an intention to use e-government services. Few respondents (6%) were informed through radio or television; 7 percent through meetings with municipality officials; and 5 percent through seminars or workshops. Although a small number of the respondents were informed through radio, television, seminars and workshops, the researcher assumes that these sources of information are reliable because of the quality and quantity of information a person can be provided

with. Therefore, district municipalities need to use social media such as radio, newspapers and television to reach a large number of people at once, but there is also a need for seminars, workshops and meetings between municipality officials and citizens for optimal sensitisation.

Furthermore, awareness programmes should be all-encompassing; they should not be limited to information about the existence of the district website but should also include the benefits associated with accessing the services electronically as well as the steps to be followed in order to get online information and services.

Though the results of Table 6.13 and Graph 6.12 show the level of awareness in general, they do not show whether there are significant differences between district municipalities. Therefore, a Krukskall-Wallis H test was run to determine whether there was a significant difference between the four district municipalities.

A Krukskall-Wallis H test was done through four steps:

a. Testing the assumption of similarly shaped distributions

In order to do a Kruskall-Wallis H test, the shape of the distribution of the dependent variable (awareness of existence of websites) needs to be similar for each of the groups of the independent variable (the district municipalities). This assumption was tested by examining histograms of the distribution within each district. The distribution of the responses was very similar across all four district municipalities.

b. Running the Kruskall-Wallis H test

Figure 6.1: Kruskall-Wallis H test for awareness of website existence

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of How aware are you of the existence of the website (s) of your district? is the same across categories of I.1.1. Residence of the respondent.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Total N	400
Test Statistic	12.554
Degrees of Freedom	3
Asymptotic Sig. (2-sided test)	.006

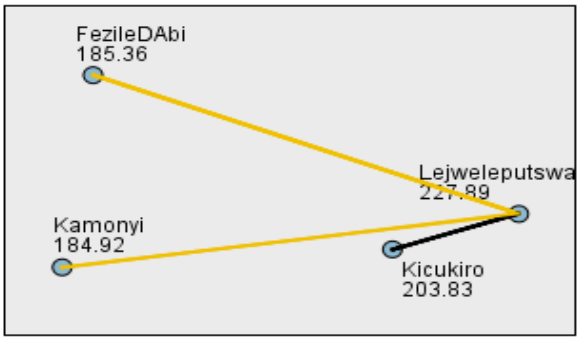
Median Awareness scores were statistically significantly different between groups, χ^2 (3) = 12.554, p = .006. Post-hoc tests were done to determine between which groups the differences lay.

c. Post-hoc tests to determine between which groups the differences lay

The preceding test result shows that the median awareness scores differ between at least two of the district municipalities, but an indication is not given between which of the district municipalities the differences lay. In order to determine this, post-hoc analysis was conducted as can be seen in Figure 6.2.

Figure 6.2: Pairwise comparisons of the district municipalities

Pairwise Comparisons of I.1.1. Residence of the respondent



Each node shows the sample average rank of I.1.1. Residence of the respondent.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Kamonyi-FezileDAbi	.440	14.017	.031	.975	1.000
Kamonyi-Kicukiro	18.910	14.017	1.349	.177	1.000
Kamonyi-Lejweleputswa	42.970	14.017	3.066	.002	.013
FezileDAbi-Kicukiro	-18.470	14.017	-1.318	.188	1.000
FezileDAbi-Lejweleputswa	42.530	14.017	3.034	.002	.014
Kicukiro-Lejweleputswa	24.060	14.017	1.716	.086	.516

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. This post-hoc analysis revealed statistically significant differences in median awareness scores only between the Lejweleputswa and Fezile Dabi district

municipalities (p=0.014), and between the Lejweleputswa and Kamonyi district municipalities (p=0.013).

d. Final results of Kruskall-Wallis H test

Distributions of awareness scores were similar for all groups, as assessed by visual inspection of histograms. There was a statistically significant difference in the awareness scores between the different districts, $\chi^2(3) = 12.554$, p = .006. After a Bonferonni adjustment, the post-hoc analysis revealed that statistically significant differences occurred between the level of awareness of respondents from Lejweleputswa and Fezile Dabi district municipalities (p=0.014), and between Lejweleputswa and Kamonyi district municipalities (p=0.013). Respondents from the Lejweleputswa district municipality (mean rank = 227.89) had a significantly higher level of awareness compared to both Fezile Dabi (mean rank = 185.36) and Kamonyi district municipalities (mean rank = 184.92).

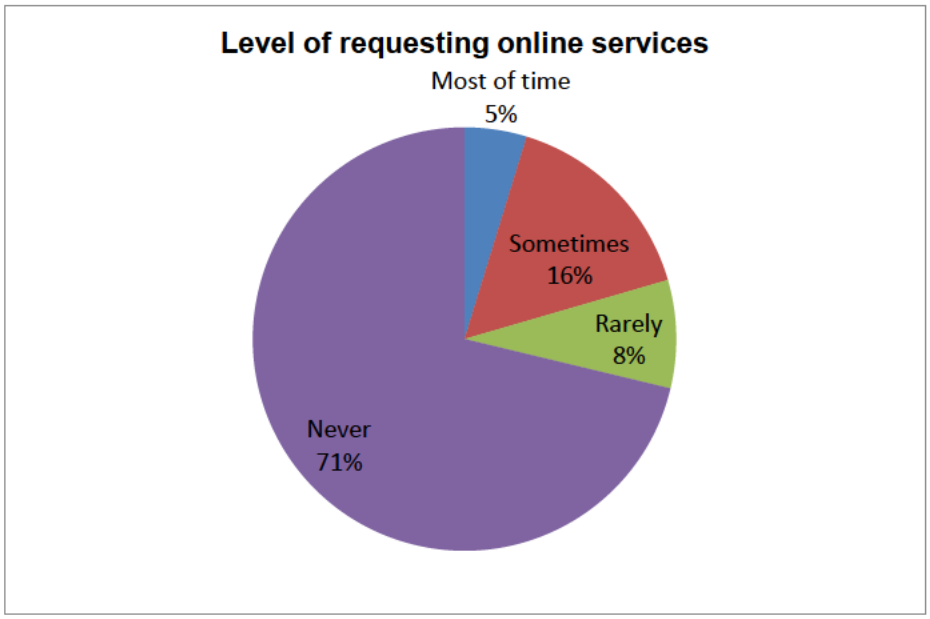
6.2.5 Access and utilisation of e-government services

Having a website and posting information and services on the website is one thing, but ensuring that citizens are aware of and using those services is quite another.

Table 6.15: Level of utilisation of online services by the respondents

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
To what extent do you request online information and online services provided by the district municipality via its website?	Most of time	7	7.0%	2	2 0%	9	9.0%	1	1 0%	19	4.8%
	Sometimes	24	24 0%	6	6 0%	17	17 0%	16	16.0%	63	15.8%
	Rarely	11	11 0%	6	6 0%	9	9.0%	7	7 0%	33	8 2%
	Never requested such services	58	58 0%	86	86.0%	65	65 0%	76	76.0%	285	71 2%
	Total	100	100 0%	100	100.0%	100	100 0%	100	100 0%	400	100 0%

Overall, the results of Table 6.15 show that the level of utilisation of e-government services by the respondents is very low. As a result, money and time which could have been saved through the use of e-government services will continue to be lost. The results of Graph 6.14 expand more on this.



Graph 6.14: The extent to which e-government services are requested and utilised by respondents

As shown in Graph 6.14, more than 70 percent of the respondents have never visited nor requested anything from the district municipalities' websites. Only 5 percent said that they request online services provided by the district municipalities' websites most of the time. During the survey in the field, a respondent commented: "*No one is interested to visit the government websites and municipality websites in particular. If you think that I am lying try to ask and you will find that 90 percent are using internet either for WhatsApp, Facebook, and reading news. Few people here can spend their time and money to check what is on the municipality websites*". This statement or comment was not in contradiction to what one IT personnel member interviewed said: "*We are somehow discouraged when we see that people don't know what is done and available for them and are not utilising them; it is discouraging*". According to Shezi (2015: online), the majority of internet users spend much of their time on social media such as Facebook, WhatsApp, Twitter and Instagram. Reading online newspapers and checking e-mails are also activities on which the internet users spend their time. Only a limited number of internet users

spend their time visiting government websites. In this regard, Heeks (2002:32) argues that one of the factors contributing to the failure of e-government is the low level of utilisation of e-government services by citizens and businesses. It is not worth providing online services to people who do not need, request or utilise them.

Table 6.15 and Graph 6.14 indicate the level of request and utilisation of e-government services by the respondents, but do not show if there are significant differences between the four district municipalities. Therefore, a Kruskall-Wallis H test was run to determine any significant differences between the district municipalities in the extent to which participants request online information and services provided by the district municipalities' websites. A Kruskall-Wallis H test was run through four steps:

a. Testing the assumption of similarly shaped distributions

In order to do a Kruskall-Wallis H test, the shape of the distribution of the dependent variable (requesting online information and services) needs to be similar for each of the groups of the independent variable (the district municipalities). This assumption was tested by examining histograms of the distribution within each district. The distribution of responses was very similar across all four district municipalities and therefore the assumption was not violated.

b. Running the Kruskall-Wallis H test

Figure 6.3: Kruskall-Wallis H test for the extent to which online information is requested

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Request_online_info_extent_ recoded is the same across categories of I.1.1. Residence of the respondent.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Total N	400
Test Statistic	23.455
Degrees of Freedom	3
Asymptotic Sig. (2-sided test)	.000

Median scores were statistically significantly different between groups, $\chi^2(3) = 23.455$, $p = .000$. The above test result tells us that the median scores differ between at least two of the district municipalities, but it does not give us an indication between

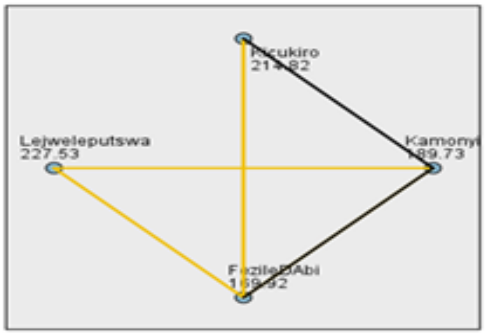
which of the districts the differences lay. In order to determine this, a post-hoc analysis was conducted as can be seen in Figure 6.4.

c. Post-hoc tests to determine between which groups the differences lay

Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. Adjusted p-values are presented. This post-hoc analysis revealed statistically significant differences in median scores for the extent to which online information and online services provided by the district's website are requested, the differences between the Lejweleputswa and Fezile Dabi district municipalities (p=0.000), between the Fezile Dabi and Kicukiro district municipalities (p=0.003) and between the Kamonyi and Lejweleputswa district municipalities (p=0.022).

Figure 6.4: Pairwise comparisons of the municipalities

Pairwise Comparisons of I.1.1. Residence of the respondent



Each node shows the sample average rank of I.1.1. Residence of the respondent.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
FezileDAbi-Kamonyi	-19.810	13.016	-1.522	.128	.768
FezileDAbi-Kicukiro	-44.900	13.016	-3.450	.001	.003
FezileDAbi-Lejweleputswa	57.610	13.016	4.426	.000	.000
Kamonyi-Kicukiro	25.090	13.016	1.928	.054	.323
Kamonyi-Lejweleputswa	37.800	13.016	2.904	.004	.022
Kicukiro-Lejweleputswa	12.710	13.016	.976	.329	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

d. Final results on the level of utilisation of e-government services

Distributions of the scores were similar for all groups, as assessed by the visual inspection of histograms. There was a statistically significant difference in scores between different district municipalities, $\chi^2(3) = 23.455$, $p = 0.000$. After Bonferonni adjustment, post-hoc analysis revealed that statistically significant differences occurred between the Lejweleputswa and Fezile Dabi district municipalities

(p=0.000), between the Fezile Dabi and Kicukiro district municipalities (p=0.003) and between the Kamonyi and Lejweleputswa district municipalities (p=0.022). The Lejweleputswa district municipality (mean rank = 227.53) had significantly higher requests for online information and online services from the district's website compared to both Fezile Dabi (mean rank = 169.92) and Kamonyi district municipalities (mean rank = 189.73). In addition, the Kicukiro district (mean rank = 214.82) had significantly higher requests for online information and online services than Fezile Dabi.

6.2.6 Factors that determine the utilisation of e-government services

Factors such as level of education, age, gender, level of income, English and French language literacy, computer and internet literacy are among other factors that may determine the utilisation of online services. These factors were discussed earlier in this chapter and it was shown that overall the biographical information of respondents might have influenced the low level of awareness and utilisation of e-government services as shown in Graphs 12 and 14. According to Rogers (2003:215), there are factors that may encourage the utilisation of e-government services while others may impede its utilisation. In this study, the following factors were investigated:

- Availability of ICT tools and infrastructure;
- Perceived usefulness of e-government services by the respondents;
- Perceived difficulties in the use of e-government by the respondents;
- Perceived quality of online services provided by the district municipality;
- Perceived online customer care when using e-government services;
- Existence of additional access facilities; and
- Perceived security and privacy of e-government services by the respondents.

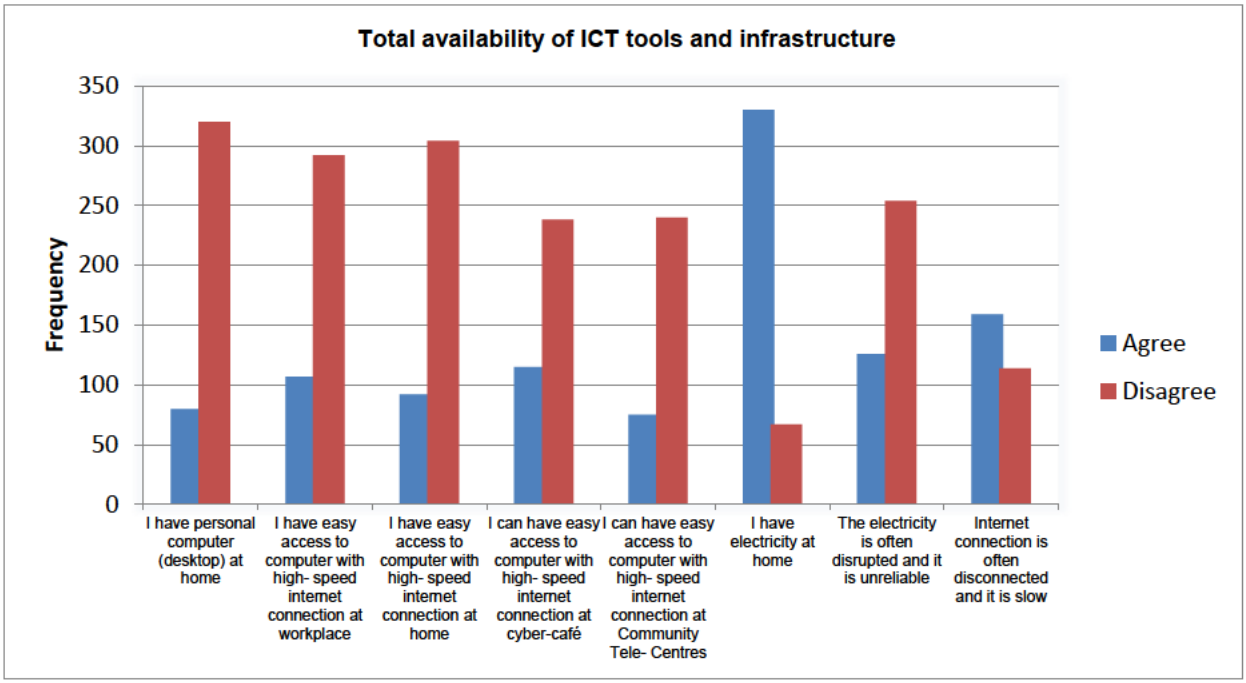
6.2.6.1 Availability of ICT tools and ICT infrastructure

Lack of ICT tools such as computers (desktop or laptop), smartphones and tablets for citizens, as well as the lack of access to ICT infrastructure such as internet connection and electricity might limit the level of request and use of e-government services. The results of Table 6.16 show whether the respondents have the necessary tools in order to request and use online information and services.

Table 6.16: Availability of necessary tools for the use of e-government services

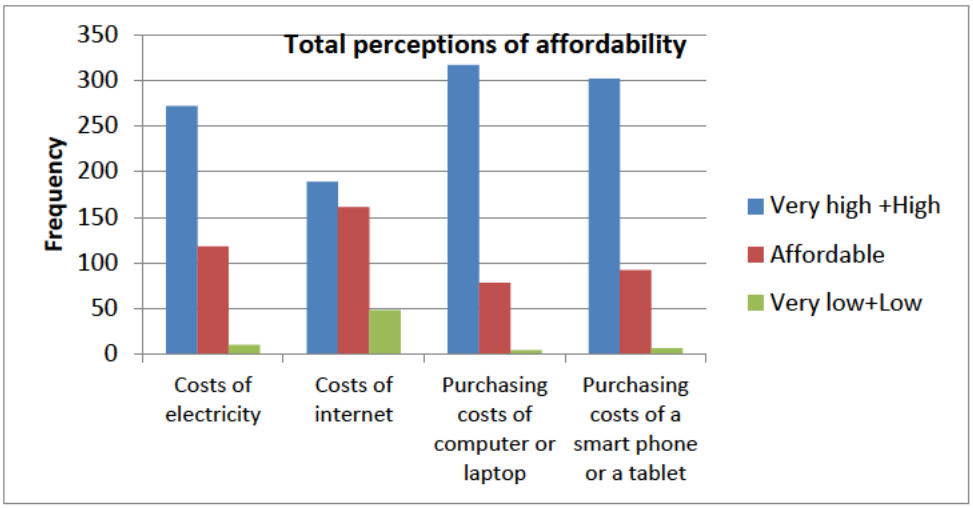
		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentage
I have personal computer (desktop) at home	Strongly Agree	12	12.0%	10	10.0%	19	19.0%	16	16.0%	57	80	20.0%
	Agree	8	8.0%	4	4.0%	4	4.0%	7	7.0%	23		
	Neither Agree nor Disagree	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0		0.0%
	Disagree	29	29.0%	44	44.0%	34	34.0%	49	49.0%	156	320	80.0%
	Strongly Disagree	51	51.0%	42	42.0%	43	43.0%	28	28.0%	164		
I have easy access to computer with high-speed internet connection at workplace	Strongly Agree	17	17.0%	10	10.0%	23	23.0%	19	19.0%	69	107	26.7%
	Agree	15	15.0%	6	6.0%	8	8.0%	9	9.0%	38		
	Neither Agree nor Disagree	1	1.0%	0	0.0%	0	0.0%	0	0.0%	1		0.2%
	Disagree	19	19.0%	43	43.0%	24	24.0%	49	49.0%	135	292	73.0%
	Strongly Disagree	48	48.0%	41	41.0%	45	45.0%	23	23.0%	157		
I have easy access to computer(desktop or laptop) with high-speed internet connection at home	Strongly Agree	7	7.0%	1	1.0%	24	24.0%	20	20.0%	52	92	23.0%
	Agree	13	13.0%	9	9.0%	9	9.0%	9	9.0%	40		
	Neither Agree nor Disagree	3	3.0%	0	0.0%	1	1.0%	0	0.0%	4		1.0%
	Disagree	25	25.0%	46	46.0%	23	23.0%	45	45.0%	139	304	76.0%
	Strongly Disagree	52	52.0%	44	44.0%	43	43.0%	26	26.0%	165		
I can have easy access to computer with high- speed internet connection at cyber-café	Strongly Agree	7	7.0%	2	2.0%	23	23.0%	13	13.0%	45	115	28.7%
	Agree	11	11.0%	9	9.0%	23	23.0%	27	27.0%	70		
	Neither Agree nor Disagree	18	18.0%	17	17.0%	4	4.0%	8	8.0%	47		11.8%
	Disagree	21	21.0%	40	40.0%	19	19.0%	35	35.0%	115	238	59.6%
	Strongly Disagree	43	43.0%	32	32.0%	31	31.0%	17	17.0%	123		
I can have easy access to computer with high- speed internet connection at Community Tele-Centres	Strongly Agree	12	12.0%	1	1.0%	7	7.0%	10	10.0%	30	75	18.7%
	Agree	14	14.0%	15	15.0%	14	14.0%	2	2.0%	45		
	Neither Agree nor Disagree	23	23.0%	25	25.0%	23	23.0%	14	14.0%	85		21.2%
	Disagree	19	19.0%	37	37.0%	28	28.0%	57	57.0%	141	240	60.0%
	Strongly Disagree	32	32.0%	22	22.0%	28	28.0%	17	17.0%	99		
I have electricity at home	Strongly Agree	53	53.0%	59	59.0%	58	58.0%	39	39.0%	209	330	82.4%
	Agree	42	42.0%	37	37.0%	16	16.0%	26	26.0%	121		
	Neither Agree nor Disagree	2	2.0%	0	0.0%	1	1.0%	0	0.0%	3		0.8%
	Disagree	0	0.0%	4	4.0%	11	11.0%	26	26.0%	41	67	16.7%
	Strongly Disagree	3	3.0%	0	0.0%	14	14.0%	9	9.0%	26		
The electricity is often disrupted and it is unreliable	Strongly Agree	3	3.0%	0	0.0%	10	10.0%	9	9.0%	22	126	31.5%
	Agree	13	13.0%	15	15.0%	37	37.0%	39	39.0%	104		
	Neither Agree nor Disagree	7	7.0%	7	7.0%	1	1.0%	5	5.0%	20		5.0%
	Disagree	42	42.0%	69	69.0%	37	37.0%	41	41.0%	189	254	63.4%
	Strongly Disagree	35	35.0%	9	9.0%	15	15.0%	6	6.0%	65		
Internet connection is often disconnected and it is slow	Strongly Agree	6	6.0%	1	1.0%	11	11.0%	6	6.0%	24	159	39.8%
	Agree	34	34.0%	29	29.0%	39	39.0%	33	33.0%	135		
	Neither Agree nor Disagree	47	47.0%	51	51.0%	16	16.0%	13	13.0%	127		31.8%
	Disagree	7	7.0%	17	17.0%	18	18.0%	38	38.0%	80	114	28.5%
	Strongly Disagree	6	6.0%	2	2.0%	16	16.0%	10	10.0%	34		

Overall, the results of Table 6.16 show that the necessary ICT tools or devices are not available for the respondents to be able to request and use e-government services. The results of Table 6.16 are summarised in Graph 6.15.



Graph 6.15: Availability of ICT tools or devices and other infrastructure

The results of Graph 6.15 show that the respondents experience more a lack of the necessary ICT devices (computers, smartphones and tablets) than ICT infrastructure (electricity and internet connection). In general, the respondents were less concerned about electricity and internet connectivity and much more concerned with the lack of necessary ICT tools or devices. However, more concerns about electricity and internet connections were recorded in Kamonyi and Kicukiro than in Lejweleputswa and Fezile Dabi. The availability of ICT tools and infrastructure goes hand-in-hand with the affordability. If potential users perceive something as being too expensive it is unlikely that they will buy it even if it might be useful to them. In this regard, the researcher investigated the respondents' perceptions of the affordability of the necessary ICT tools and infrastructure. The results are summarised in Graph 6.16.



Graph 6.16: Perceptions of affordability of ICT devices and other infrastructure

The results of affordability show that the respondents have difficulty buying computers (desktop or laptop), smartphones and tablets as compared with paying for electricity and the internet.

Though the results of Table 6.16 and Graph 6.16 show the availability of ICT tools and infrastructure in general, they do not indicate whether the problem of availability of ICT tools and infrastructure is experienced by the respondents at the same level. Therefore, in order to determine the differences, scores on the Likert scale table were summed up to obtain a total score of availability of ICT tools and infrastructure, which was then compared between the different district municipalities by means of a one-way ANOVA. Scores were recoded so that higher scores were indicative of greater access to ICT tools and infrastructure.

The one-way ANOVA was done in three steps:

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district, Normal Q-Q Plots were examined. For data to be normally distributed, the points in the graphs above must approximately follow the diagonal line. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total Infrastructure

Levene Statistic	df1	df2	Sig.
15.021	3	396	.000

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.000). For this reason, the result of the Welch ANOVA will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total Infrastructure

	Statistic[a]	df1	df2	Sig.
Welch	1.991	3	216.710	.116

a. Asymptotically F distributed.

From the Sig. column above, it can be seen that there was no statistically significant difference in the access to ICT tools or devices and infrastructure scores between any of the different district municipalities, Welch F (3, 216.710) = 1.991, p = 0.116. Thus, the districts' score calculated did not differ in terms of access to infrastructure. The descriptive table (Table 6.17) confirms this result, with the means being very close to each other between different district municipalities.

Table 6.17: Mean scores for the availability of ICT tools

Total Infrastructure

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	23.9800	5.17371	.51737	22.9534	25.0066	12.00	37.00
Fezile Dabi	100	23.1700	4.56614	.45661	22.2640	24.0760	15.00	38.00
Kicukiro	100	24.8000	7.66337	.76634	23.2794	26.3206	14.00	41.00
Kamonyi	100	24.8100	6.30968	.63097	23.5580	26.0620	12.00	37.00
Total	400	24.1900	6.06017	.30301	23.5943	24.7857	12.00	41.00

6.2.6.2 Perceived usefulness of e-government services by the respondents

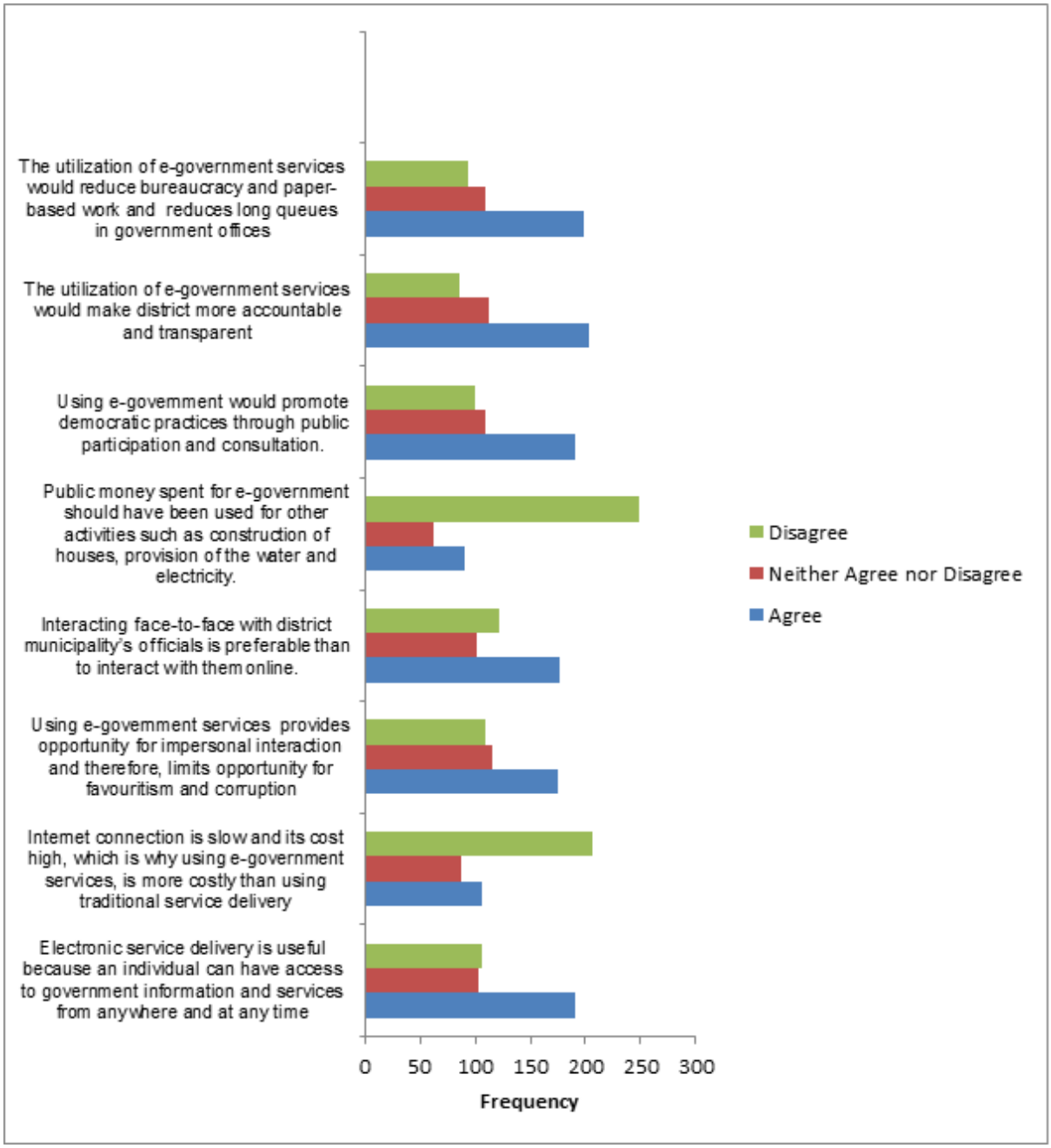
According to Venkatesh *et al*. (2003:447), online information and services are unlikely to be used by citizens unless online service delivery is perceived to be useful or advantageous by citizens compared to traditional public service delivery (physical visit to public offices and face-to-face interactions). Negative perceptions of citizens towards online service delivery negatively affect the use of e-government services.

As shown previously (see Graph 6.14), the level of utilisation of online information and services by the respondents is very low. Therefore, the researcher investigated the respondents' perception of the usefulness of e-government services. This was done because the respondents' perception of e-government services might be one of the reasons for the lack in requesting and utilising e-government services.

Overall the results of Table 6.18 show that a large number of the respondents appreciate the usefulness of e-government services. However, it can also be seen that a significant number of the respondents did not agree or disagree with the proposed items and that indicates that they did not know anything about the usefulness of e-government. It is a challenge, because if people do not appreciate the usefulness of e-government services they will not use them. Expanded results on perceived usefulness are summarised in Graph 6.17

Table 6.18: Perceived usefulness of e-government services by the respondents

		South Africa				Rwanda							
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi					
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frrequencies		Total percentage	
Using e-government services would consume too much of my time and money	Strongly Agree	9	9.0%	4	4.0%	6	6.0%	1	1.0%	20	99	5.0%	24.8%
	Agree	16	16.0%	21	21.0%	28	28.0%	14	14 0%	79		19.8%	
	Neither Agree nor Disagree	16	16.0%	11	11.0%	36	36.0%	18	18 0%	81		20.20%	
	Disagree	28	28.0%	32	32.0%	27	27.0%	63	63 0%	150	220	37.5%	55.0%
	Strongly Disagree	31	31.0%	32	32.0%	3	3.0%	4	4.0%	70		17.5%	
Electronic service delivery is useful for me because I have access to government information and services from anywhere and at any time (24/7) convenient for me.	Strongly Agree	21	21.0%	24	24.0%	9	9.0%	9	9.0%	63	191	15.8%	47.8%
	Agree	42	42.0%	27	27.0%	33	33.0%	26	26 0%	128		32.0%	
	Neither Agree nor Disagree	22	22.0%	25	25.0%	39	39.0%	17	17 0%	103		25.80%	
	Disagree	12	12.0%	22	22.0%	16	16.0%	45	45 0%	95	106	23.8%	26.8%
	Strongly Disagree	3	3.0%	2	2.0%	3	3.0%	3	3.0%	11		280.0%	
Internet connection is slow and its cost high, which is why using e-government services, is more costly than using traditional service delivery method (physical visit of local government offices).	Strongly Agree	11	11.0%	4	4.0%	3	3.0%	4	4.0%	22	106	5.5%	26.5%
	Agree	22	22.0%	20	20.0%	33	33.0%	9	9.0%	84		21.0%	
	Neither Agree nor Disagree	24	24.0%	22	22.0%	27	27.0%	15	15 0%	88		22.0%	
	Disagree	19	19.0%	24	24.0%	33	33.0%	69	69 0%	145	206	36.2%	41.1%
	Strongly Disagree	24	24.0%	30	30.0%	4	4.0%	3	3.0%	61		15.2%	
Using e-government services is beneficial for me because it provides opportunity for impersonal interaction and therefore, limits opportunity for favouritism and corruption.	Strongly Agree	18	18.0%	4	4.0%	17	17.0%	14	14 0%	53	175	13.2%	43.7%
	Agree	32	32.0%	34	34.0%	32	32.0%	24	24 0%	122		30.5%	
	Neither Agree nor Disagree	27	27.0%	38	38.0%	35	35.0%	15	15 0%	115		28.8%	
	Disagree	18	18.0%	18	18.0%	15	15.0%	44	44 0%	95	110	23.8%	27.6%
	Strongly Disagree	5	5.0%	6	6.0%	1	1.0%	3	3.0%	15		3.8%	
Interacting face-to-face with district municipality's officials is preferable than to interact with them online.	Strongly Agree	16	16.0%	10	10.0%	5	5.0%	9	9.1%	40	176	10.0%	44.1%
	Agree	38	38.0%	31	31.0%	28	28.0%	39	39.4%	136		34.1%	
	Neither Agree nor Disagree	25	25.0%	34	34.0%	28	28.0%	14	14.1%	101		25.3%	
	Disagree	19	19.0%	19	19.0%	36	36.0%	34	34 3%	108	132	27.1%	30.6%
	Strongly Disagree	2	2.0%	6	6.0%	3	3.0%	3	3.0%	14		3.5%	
Public money spent for e-government websites should have been used for other activities such as construction of houses, provision of the water and electricity.	Strongly agree	22	22.0%	6	6.0%	3	3.0%	6	6.0%	37	90	9.2%	22.4%
	Agree	22	22.0%	11	11.0%	13	13.0%	7	7.0%	53		13.2%	
	Neither Agree nor Disagree	11	11.0%	20	20.0%	24	24.0%	7	7.0%	62		15.50%	
	Disagree	28	28.0%	34	34.0%	47	47.0%	77	77 0%	186	248	46.5%	62.0%
	Strongly Disagree	17	17.0%	29	29.0%	13	13.0%	3	3.0%	62		15.5%	
Using e-government would promote democratic practices through public participation and consultation.	Strongly Agree	10	10.0%	6	6.0%	21	21.0%	9	9.0%	46	191	11.5%	47.7%
	Agree	40	40.0%	39	39.0%	33	33.0%	33	33 0%	145		36.2%	
	Neither Agree nor Disagree	36	36.0%	33	33.0%	28	28.0%	12	12 0%	109		27.2%	
	Disagree	11	11.0%	19	19.0%	14	14.0%	43	43 0%	87	100	21.8%	25.0%
	Strongly Disagree	3	3.0%	3	3.0%	4	4.0%	3	3.0%	13		3.2%	
The utilization of e-government services would make district more accountable and transparent.	Strongly Agree	11	11.0%	7	7.0%	22	22.0%	13	13 0%	53	203	13.2%	50.7%
	Agree	40	40.0%	35	35.0%	41	41.0%	34	34 0%	150		37.5%	
	Neither Agree nor Disagree	37	37.0%	37	37.0%	24	24.0%	14	14 0%	112		28.0%	
	Disagree	11	11.0%	17	17.0%	10	10.0%	34	34 0%	72	85	18.0%	21.2%
	Strongly Disagree	1	1.0%	4	4.0%	3	3.0%	5	5.0%	13		3.2%	
The utilization of e-government services would reduce bureaucracy and paper-based work and therefore, reduce long queues in government offices and enhance better and quicker service delivery.	Strongly Agree	17	17.0%	8	8.0%	24	24.0%	14	14 0%	63	189	15.8%	49.6%
	Agree	30	30.0%	33	33.0%	43	43.0%	29	29 0%	135		33.8%	
	Neither Agree nor Disagree	31	31.0%	39	39.0%	22	22.0%	17	17 0%	109		27.2%	
	Disagree	13	13.0%	16	16.0%	9	9.0%	35	35 0%	73	93	18.2%	23.2%
	Strongly Disagree	9	9.0%	4	4.0%	2	2.0%	5	5.0%	20		5.0%	



Graph 6.17: Perceived usefulness of e-government services

As can be seen from Graph 6.17, the respondents are more convinced that e-government can reduce bureaucracy, paper-based work and long queues for citizens waiting for services in public offices than reducing favouritism and corruption. In addition, a significant number of the respondents still believe that face-to-face interaction with public officials is preferable to interacting with them online. This is a challenge, because people who believe that face-to-face interaction is preferable to online interaction will be hesitant to request and utilise e-government services.

The results of Graph 6.17 show the overall picture of perceived usefulness of e-government, but they do not indicate whether there are significant differences between the four district municipalities. To fill this gap, a one-way ANOVA test was run in three steps:

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district municipality, Normal Q-Q Plots were examined. For data to be normally distributed, the points in the graphs above must approximately follow the diagonal line. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total Perceived Usefulness

Levene Statistic	df1	df2	Sig.
4.283	3	396	.005

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.005). For this reason, the result of the Welch ANOVA will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total Perceived Usefulness

	Statistic[a]	df1	df2	Sig.
Welch	1.841	3	218.703	.141

a. Asymptotically F distributed.

From the Sig. column above it can be seen that there was no statistically significant difference in the total perceived usefulness scores between any of the different district municipalities, Welch F (3, 218.703) = 1.841, p = 0.141. Thus, the district municipalities did not differ in terms of this total awareness of their perceived usefulness of e-government services. The descriptive table (Table 6.19) confirms the result with the means being very close to each other for the different district municipalities.

Table 6.19: Comparison of the mean scores on perceived usefulness

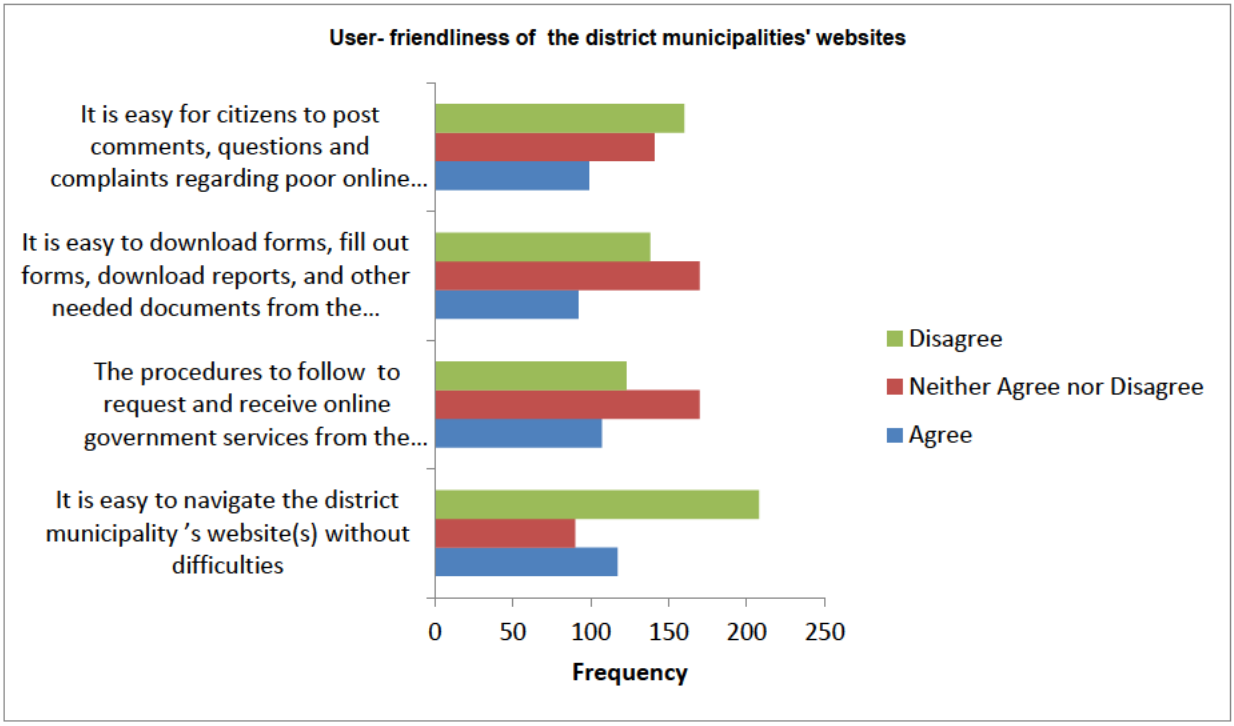
Total Perceived Usefulness

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	29.5900	3.86409	.38641	28.8233	30.3567	22.00	37.00
Fezile Dabi	100	30.0800	5.09045	.50905	29.0699	31.0901	21.00	41.00
Kicukiro	100	30.3100	4.60280	.46028	29.3967	31.2233	23.00	42.00
Kamonyi	100	28.8200	4.94899	.49490	27.8380	29.8020	18.00	41.00
Total	400	29.7000	4.66846	.23342	29.2411	30.1589	18.00	42.00

6.2.6.3 User-friendliness, quality of online services and online customer care

Factors such as user-friendliness, quality of online services and online customer care can influence citizens' utilisation of online services. When an innovation is found to be easy to learn and use (user-friendliness), an individual will adopt it and use it. The quality of online information and services also influences the adoption and use of e-government services. In this context, Borins (2001) quoted (in Alshehri & Drew 2012:17) argues that the content, presentation and relevancy of online information and services determine users' satisfaction and lead to the regular request and utilisation of e-government services. Furthermore, the request and use of online information and services provided *via* the district municipality's website can be influenced by the quality of online customer care received when a person is using e-government services. For instance, people may be discouraged from using online services if their calls on mobile phones are not answered by the public officials or employees; if e-mails sent to the officials are not responded to (no feedback); if their files sent *via* internet are often lost; and if using online services requires too many procedures. When these scenarios happen often, people will prefer using the traditional way of getting public service (physical visit to public offices) rather than online service delivery.

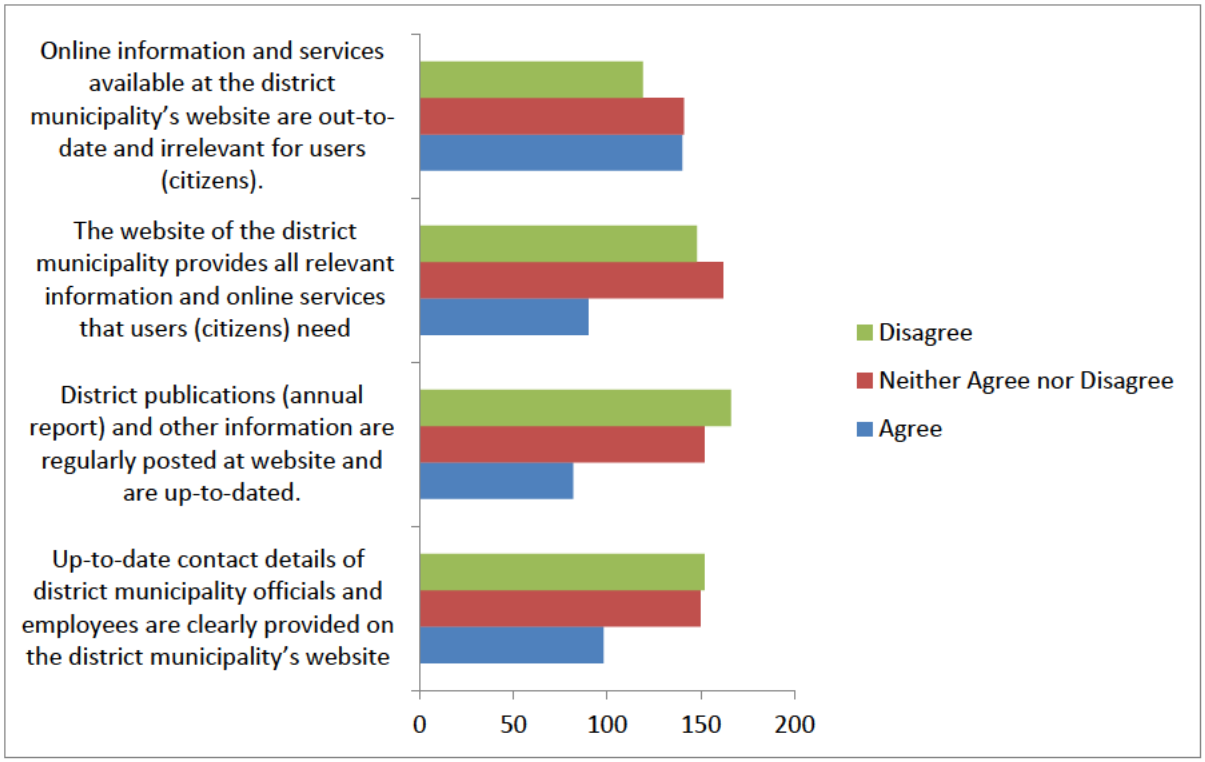
Factors such as user-friendliness, quality online services and online customer care were investigated to see whether they might not be the cause of the lack of request and utilisation of online information and services by the respondents as shown by Table 6.15. Graphs 6.18, 6.19 and 6.20 summarise the results on user-friendliness, quality online services and online customer care.



Graph 6.18: Perceived ease of use (user-friendliness) of e-government services.

As can be seen from Graph 6.18, the respondents perceive the user-friendliness of the district municipalities' websites as a challenge. A larger number of the respondents disagreed than agreed with the proposed items on user-friendliness and therefore perceive the district municipalities' websites as not easy to learn and use. For instance, the respondents strongly disagree with the statement that it is easy for citizens to post comments and complaints regarding poor service delivery and they disagree with the statement that it is easy to navigate the district municipalities' websites. In addition, as shown by Graph 6.18, a significant number of respondents did not agree or disagree with presented items on user-friendliness. This indicates that they had no idea about the user-friendliness of the district municipality's website because they had never used it. However, though the respondents perceive the district municipalities' websites as not user-friendly in general, the researcher argues that this is not the real fact. To navigate the district municipality's website might be

easy and very easy, but because the potential users (citizens) do not have the skills and did not receive any guidelines on how to navigate through the website, they will always perceive it as difficult to learn and to use.



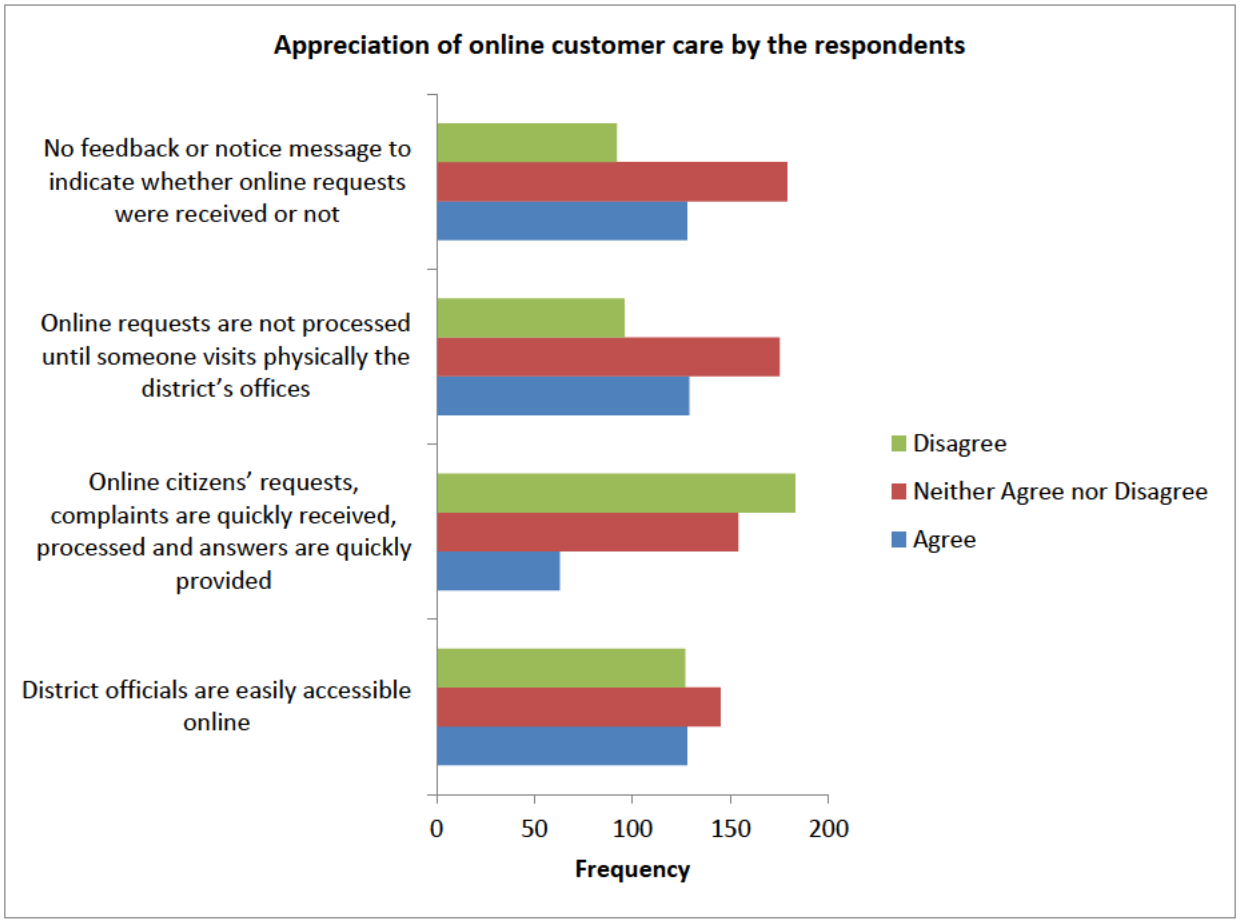
Graph 6.19: Perceived quality of online information and services provided via district municipality website

The results of Graph 6.19 show that a large number of the respondents neither agreed nor disagreed with the proposed items on quality of online information and services available on the district municipality's website. The results also show that a significant number of the respondents disagreed rather than agreed with the proposed items on the quality of online information and services provided by district municipalities' websites. For instance, the respondents strongly disagreed with the statement that decisions taken by the district municipality council, publications and other relevant information are regularly posted on the district municipality's website and are up-to-date. During the survey in the field, some comments were made on the issue of quality of online information and services available on the district municipality's website. The common comments received include:

"*Visiting the district municipality's website is a waste of time and money as you cannot find relevant information and what is posted is mostly out-of-date. You find*

out-of-date job advertisements and out-of-date tender announcements". In addition, one respondent said *"I visited the district municipality's website but I failed to open the PDF file I wanted. I waited for almost 30 minutes without success*".

To conclude, the quality of online information and services provided through district municipalities' websites are disapproved by a large number of the respondents because they are mostly out-of-date, irrelevant and incomplete.



Graph 6.20: Perceived online customer care

The results of Graph 6.20 show that a large number of the respondents neither agreed nor disagreed with the proposed items about online customer care. This indicates that they do not know anything about online customer care because they have never requested online services to enable them to appreciate online customer care. Taking into consideration how the respondents disagreed or agreed with the proposed items about online customer care received, it can be seen that the respondents are concerned about online customer care received during their use of e-government services from the district municipalities' websites. For instance, a large

number of the respondents agreed with the statement that no feedback or notice message was received to indicate whether the sent e-mails were received or not. In this context, one respondent commented and said: "*When you open the district municipality website there is a reserved place called (write to us or write to the mayor), there is another place (share with us or send us your comments) but whenever I tried to send an e-mail there was no answer and there is no feedback or a signal which shows you that your message reached the receiver or not. Frankly speaking, public officials particularly those of local government, do not respond to e-mails from the general public*". In addition, another respondent said, "*if you go to the district municipality website, you can see that they are connected and using social media such as Twitter and Facebook but officials are always absent on these social media. Social media platforms such as Twitter, Facebook and Instagram are underutilised by district municipality officials to interact with citizens*".

Though Graphs 6.18, 6.19 and 6.20 show the perceptions of the respondents on issues such as user-friendliness, quality online services and online customer care they do not, however, indicate whether there are significant differences between the four district municipalities. In order to determine whether there are differences between the district municipalities in user-friendliness, quality of e-government services and online customer care, totals were calculated for the Likert scale tables related to perceived user-friendliness, perceived quality of online services and perceived online customer care. Scores were recoded so that higher scores were indicative of higher satisfaction. A multivariate analysis of variance (MANOVA) testing was done and six steps were followed:

a. Testing the assumption of normality

In order to determine whether data were normally distributed within each district, Normal Q-Q Plots were examined. For data to be normally distributed, the points in the graphs above must approximately follow the diagonal line. From the Normal Q-Q plots, there were some minor deviations from normality, although data were mostly approximately normally distributed.

b. MANOVA Results

Table 6.20: Multivariate Tests

Between Subjects Factors

		Value Label	N
Residence of respondents	1	Lejweleputswa	100
	2	Fezile Dabi	100
	3	Kicukiro	100
	4	Kamonyi	100

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.979	6123.555[b]	3.000	394.000	0.000	.979
	Wilks' Lambda	.021	6123.555[b]	3.000	394.000	0.000	.979
	Hotelling's Trace	46.626	6123.555[b]	3.000	394.000	0.000	.979
	Roy's Largest Root	46.626	6123.555[b]	3.000	394.000	0.000	.979
District	Pillai's Trace	.169	7.872	9.000	1188.000	.000	.056
	Wilks' Lambda	.838	8.049	9.000	959.043	.000	.057
	Hotelling's Trace	.186	8.127	9.000	1178.000	.000	.058
	Roy's Largest Root	.131	17.242[c]	3.000	396.000	.000	.116

a. Design: Intercept + District

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

From the row highlighted in yellow in Table 6.20, it can be seen that there was a statistically significant difference in mean scores between the districts on the combined dependent variable (user-friendliness and quality combined), $F(9.959) = 8.049$, $p < .0005$; Wilks' $\Lambda = 0.838$. In order to determine which of the dependent

variables contributed to the significant result, the tests of the between-subjects effects table below are inspected.

Table 6.21: Tests of Between-Subjects Effects

Tests of Between-Subjects Effects							
Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Par ial Eta Squared
Corrected Model	Total_User_friendliness	225.890[a]	3	75.297	6.579	0	0.047
	Total_Quality_Online info	208.450[b]	3	69.483	12.994	0	0.09
	Total_Online_Customer care	63.468[c]	3	21.156	5.312	0.001	0.039
Intercept	Total_User_friendliness	50580 01	1	50580.01	4419.515	0	0.918
	Total_Quality_Online info	50670 01	1	50670.01	9475.771	0	0.96
	Total_Online_Customer care	52372.323	1	52372.323	13149.447	0	0.971
District	Total_User_friendliness	225.89	3	75.297	6.579	0	0.047
	Total_Quality_Online info	208.45	3	69.483	12.994	0	0.09
	Total_Online_Customer care	63.468	3	21.156	5.312	0	0.039
Error	Total_User_friendliness	4532.1	396	11.445			
	Total_Quality_Online info	2117.54	396	5.347			
	Total_Online_Customer care	1577.21	396	3.983			
Total	Total_User_friendliness	55338	400				
	Total_Quality_Online info	52996	400				
	Total_Online_Customer care	54013	400				
Corrected Total	Total_User_friendliness	4757.99	399				
	Total_Quality_Online info	2325.99	399				
	Total_Online_Customer care	1640.678	399				

As can be seen from the rows highlighted in green in Table 6.21, there was a statistically significant difference in mean scores for user-friendliness ($F(3.396)= 6.579$, $p < 0.005$), quality of online information and services ($F(3.396)=12.994$, $p < 0.005$), and online customer care ($F(3.396)=5.312$, $p < 0.005$), between the different district municipalities. To determine between which of the district municipalities these differences lay, the multiple comparison table (Table 6.22) is consulted.

Table 6.22: Multiple comparisons on user-friendliness, quality of e-government services and online customer care

Multiple Comparisons								
Dependent Variable				Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Total_User_friendliness	Games-Howell	Lejweleputswa	FezileDAbi	0.21	0.48102	0.972	-1.0367	1.4567
			Kicukiro	-1.6100*	0.48673	0.006	-2.8714	-0.3486
			Kamonyi	0.14	0.51494	0.993	-1.1942	1.4742
		FezileDAbi	Lejweleputswa	-0.21	0.48102	0.972	-1.4567	1.0367
			Kicukiro	-1.8200*	0.43889	0	-2.9572	-0.6828
			Kamonyi	-0.07	0.46998	0.999	-1.288	1.148
		Kicukiro	Lejweleputswa	1.6100*	0.48673	0.006	0.3486	2.8714
			FezileDAbi	1.8200*	0.43889	0	0.6828	2.9572
			Kamonyi	1.7500*	0.47582	0.002	0.517	2 983
		Kamonyi	Lejweleputswa	-0.14	0.51494	0.993	-1.4742	1.1942
			FezileDAbi	0.07	0.46998	0.999	-1.148	1 288
			Kicukiro	-1.7500*	0.47582	0.002	-2.983	-0 517
Total_Quality_Onlineinfo	Games-Howell	Lejweleputswa	FezileDAbi	0.11	0.37017	0.991	-0.8492	1.0692
			Kicukiro	-1.6200*	0 3458	0	-2.5165	-0.7235
			Kamonyi	-1.0300*	0 3285	0.011	-1.8823	-0.1777
		FezileDAbi	Lejweleputswa	-0.11	0.37017	0.991	-1.0692	0.8492
			Kicukiro	-1.7300*	0.32555	0	-2.5737	-0.8863
			Kamonyi	-1.1400*	0.30711	0.002	-1.9364	-0.3436
		Kicukiro	Lejweleputswa	1.6200*	0 3458	0	0.7235	2.5165
			FezileDAbi	1.7300*	0.32555	0	0.8863	2.5737
			Kamonyi	0.59	0.27725	0.148	-0.1285	1.3085
		Kamonyi	Lejweleputswa	1.0300*	0 3285	0.011	0.1777	1.8823
			FezileDAbi	1.1400*	0.30711	0.002	0.3436	1.9364
			Kicukiro	-0.59	0.27725	0.148	-1.3085	0.1285
Total_Online_Customercare	Games-Howell	Lejweleputswa	FezileDAbi	-.7700*	0.29026	0.043	-1.5221	-0.0179
			Kicukiro	0.07	0.30257	0.996	-0.714	0 854
			Kamonyi	-.7500*	0.26581	0.027	-1.439	-0 061
		FezileDAbi	Lejweleputswa	.7700*	0.29026	0.043	0.0179	1.5221
			Kicukiro	8400*	0.29776	0.027	0.0685	1.6115
			Kamonyi	0.02	0.26031	1	-0.6547	0.6947
		Kicukiro	Lejweleputswa	-0.07	0.30257	0.996	-0.854	0.714
			FezileDAbi	- 8400*	0.29776	0.027	-1.6115	-0.0685
			Kamonyi	- 8200*	0.27397	0.016	-1.5303	-0.1097
		Kamonyi	Lejweleputswa	.7500*	0.26581	0.027	0.061	1.439
			FezileDAbi	-0.02	0.26031	1	-0.6947	0.6547
			Kicukiro	8200*	0.27397	0.016	0.1097	1.5303
Based on observed means.								
The error term is Mean Square(Error) = 3 983.								
*. The mean difference is significant at the .05 level.								

The results of Table 6.22 above are as follows:

Total user-friendliness

From the section highlighted in blue in Table 6.22, it can be seen that there was a significant difference in user-friendliness between Kicukiro and Lejweleputswa (p=0.006), Kicukiro and FezileDabi (p=0.000) and Kicukiro and Kamonyi (p=0.002).

From the descriptive table (Table 6.23), it can be seen that Kicukiro had a better perceived user-friendliness (mean = 12.54) than all of the other three: Lejweleputswa (mean = 10.93), Fezile Dabi (mean = 10.72) and Kamonyi (mean = 10.79).

Table 6.23: Comparison of mean on user-friendliness

Descriptive Statistics

Residence of the respondents		Mean	Std. Deviation	N
Total User friendliness	Lejweleputswa	10.9300	3.71254	100
	FezileDabi	10.7200	3.05862	100
	Kicukiro	12.5400	3.14761	100
	Kamonyi	10.7900	3.56837	100
	Total	11.2450	3.45323	400

Total quality of online information and services

From the section highlighted in green in Table 6.22, it can be seen that there were significant differences in the quality of online information and services between Lejweleputswa and Kicukiro (p=0.000), and also between Lejweleputswa and Kamonyi (p=0.011). From the descriptive table (Table 6.24), it can be seen that Lejweleputswa had a lower perceived quality of online information and services (mean = 10.62) than both Kicukiro (mean =12.24) and Kamonyi (mean = 11.65). In addition, there were also significant differences in the quality of online information and services between Fezile Dabi and Kicukiro (p=0.000), and also between Fezile Dabi and Kamonyi (p=0.002). From the descriptive table (Table 6.24), it can be seen that Fezile Dabi had a lower perceived quality of online information and services (mean = 10.51) than both Kicukiro (mean = 12.24) and Kamonyi (mean =11.65).

Table 6.24: Comparison of mean on quality of online services

Descriptive Statistics

Residence of the respondents		Mean	Std. Deviation	N
Total Quality Online Info	Lejweleputswa	10.6200	2.74425	100
	FezileDabi	10.5100	2.48427	100
	Kicukiro	12.2400	2.10396	100
	Kamonyi	11.6500	1.80557	100
	Total	11.2550	2.41445	400

Total online customer care

As can be seen from the descriptive Table 6.25, there are no significant differences between the district municipalities as the means are almost equal. However, it can be seen that Fezile Dabi is performing better (mean=11.85), followed by Kamonyi (mean=11.83), Lejweleputswa (mean=11.08) and lastly Kicukiro (mean=11.01). During the survey in the field, one respondent from the Kamonyi district municipality commented and said: "*I don't know how to use a computer to write to the mayor and other officials but I am used to calling them using my mobile phone where they always answer my call. They don't underestimate me because I am a poor citizen*". This is a good example of online customer care and it can encourage citizens to go further by using e-government services.

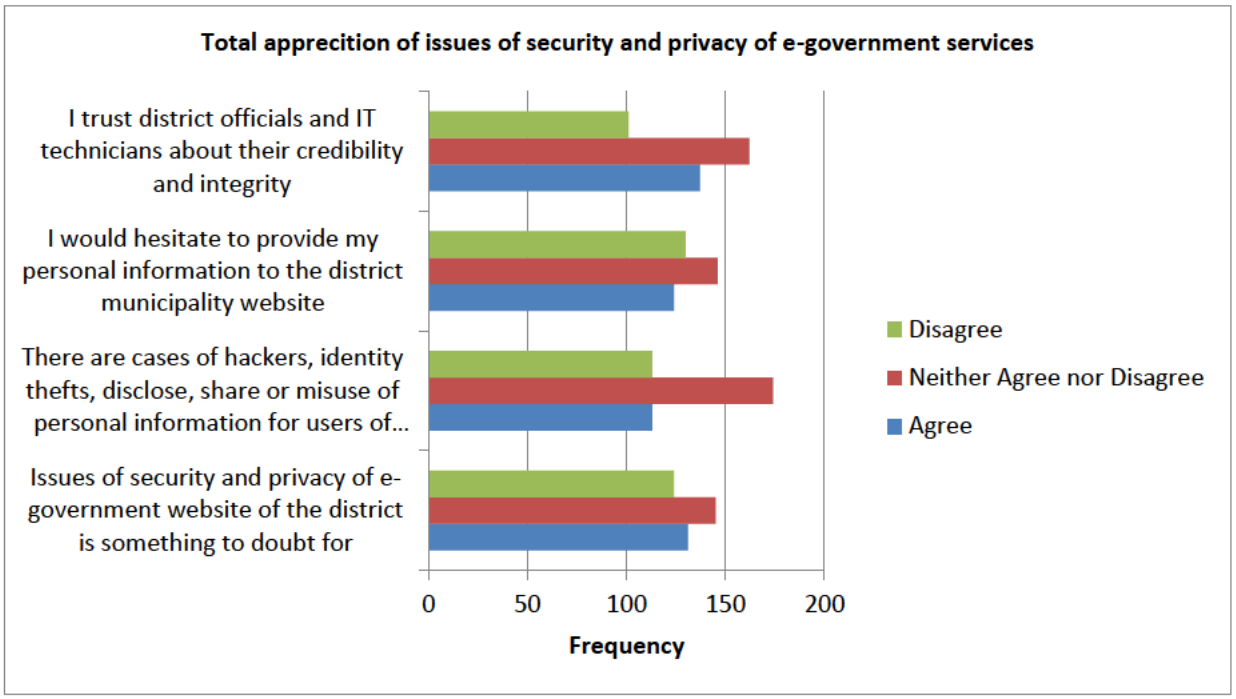
Table 6.25: Comparison of mean on online customer care

Descriptive Statistics

Residence of the respondent		Mean	Std. Deviation	N
Total Online Customer Care	Lejweleputswa	11.0800	2.08738	100
	FezileDabi	11.8500	2.01697	100
	Kicukiro	11.0100	2.19041	100
	Kamonyi	11.8300	1.64566	100
	Total	11.4425	2.02780	400

6.2.6.4 Perceived security and privacy

A number of researchers (Yayihyirad (2006); Shareef *et al*., (2009); Okoli and Mbarika (2003); Heeks (2002) and Gilbert (2004) have indicated that security and privacy are factors that can determine the use of e-government services by citizens. If people doubt the security and privacy of online interaction and transactions they are unlikely to use online services. Fear of identity theft, and the disclosure, sharing and misuse of personal information may discourage citizens to use e-government services. Therefore, respondents were asked a question in order to investigate how they rate the security and privacy of e-government services provided by district municipalities. The results are summarised in Graph 6.21.



Graph 6.21: Respondents' appreciation of issues of security and privacy

The results of Graph 6.21 show that the predominant answers on issues of security and privacy were neither agree nor disagree. This indicates that the majority of respondents did not know much about online security and privacy or they had never visited or used online information and services from the district municipalities' websites. In this context, Mpinganjira (2012:504) argues that perceived security and privacy of e-government services go hand-in-hand with the level of education of potential users (citizens). A low level of education is often associated with a high level of uncertainty of e-government services. Citizens with a low level of education are likely to have more doubts and hesitations to use online services than citizens with a certain level of education. Overall the issue of security is not such a great concern for the respondents as can be seen in Graph 6.21.

Though the results of Graph 6.21 show the level of appreciation of issues of security and privacy, they do not indicate whether there are significant differences between the district municipalities. Therefore, in order to see whether there is any difference between district municipalities, the Likert scale table was summed to obtain a total score of issues of security and privacy. Questions were recoded so that a higher score was indicative of greater concerns with security and privacy. A one-way ANOVA was run and three steps were followed:

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district municipality, Normal Q-Q Plots were examined. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total Security and Privacy

Levene Statistic	df1	df2	Sig.
8.785	3	396	.000

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.000). For this reason, the result of the Welch ANOVA will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total Security and Privacy

	Statistic[a]	df1	df2	Sig.
Welch	6.129	3	218.271	.001

a. Asymptotically F distributed.

From the Sig. column it can be seen that there was a statistically significant difference in security and privacy concerns somewhere between the different district municipalities, Welch F (3, 218.271) = 6.129, p = 0.001. In order to determine exactly between which of the different districts these differences lay, the multiple comparisons table (Table 6.26) is consulted.

Table 6.26: Multiple comparisons on perceived security and privacy of e-government services

Multiple Comparisons

Dependent Variable:

(I) I.1.1. Residence of the respondent			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Games-Howell	Lejweleputswa	Fezile Dabi	-.01000	.36885	1.000	-.9669	.9469
		Kicukiro	.69000	.29406	.091	-.0719	1.4519
		Kamonyi	1.15000*	.29849	.001	.3766	1.9234
	Fezile Dabi	Lejweleputswa	.01000	.36885	1.000	-.9469	.9669
		Kicukiro	.70000	.37203	.240	-.2650	1.6650
		Kamonyi	1.16000*	.37554	.012	.1861	2.1339
	Kicukiro	Lejweleputswa	-.69000	.29406	.091	-1.4519	.0719
		Fezile Dabi	-.70000	.37203	.240	-1.6650	.2650
		Kamonyi	.46000	.30242	.427	-.3236	1.2436
	Kamonyi	Lejweleputswa	-1.15000*	.29849	.001	-1.9234	-.3766
		Fezile Dabi	-1.16000*	.37554	.012	-2.1339	-.1861
		Kicukiro	-.46000	.30242	.427	-1.2436	.3236

*. The mean difference is significant at the 0.05 level.

From Table 6.26 it can be seen that there were significant differences in security and privacy concerns between Kamonyi and Lejweleputswa (p=0.001), and also between Kamonyi and Fezile Dabi (p=0.012). From the descriptive table (Table 6.27) it can be seen that security and privacy concerns were lower in Kamonyi (mean=11.270) than in both Lejweleputswa (mean = 12.42) and Fezile Dabi (mean = 12.43).

Table 6.27: Comparison of mean on security and privacy of e-government

Descriptives

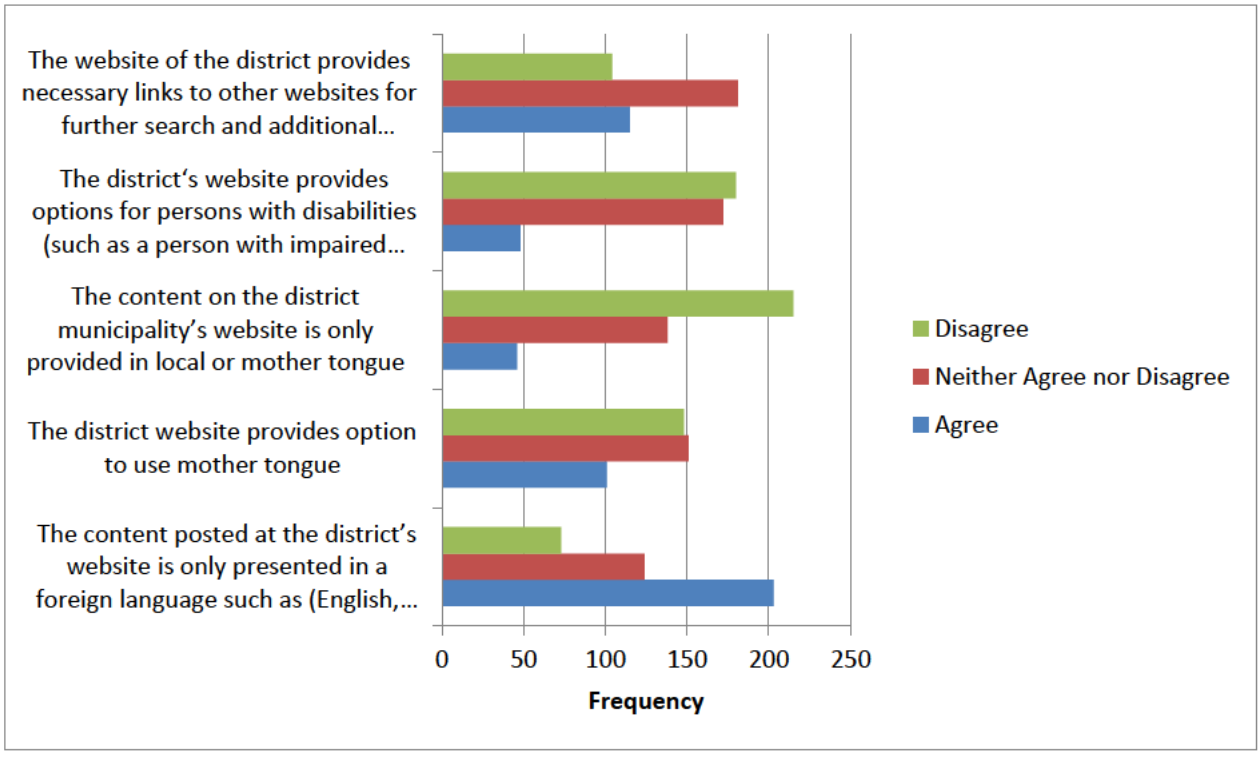
Total Security Privacy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	12.4200	2.05077	.20508	12.0131	12.8269	8.00	18.00
Fezile Dabi	100	12.4300	3.06579	.30658	11.8217	13.0383	7.00	20.00
Kicukiro	100	11.7300	2.10749	.21075	11.3118	12.1482	8.00	17.00
Kamonyi	100	11.2700	2.16890	.21689	10.8396	11.7004	7.00	16.00
Total	400	11.9625	2.42607	.12130	11.7240	12.2010	7.00	20.00

6.2.6.5 Additional access facilities

The utilisation of online services available on the district municipalities' websites requires some additional access facilities in order for people with different levels of education, from different backgrounds (immigrants for instance) and different races to feel comfortable when they visit the district websites. People may be discouraged to use online services because they feel uncomfortable when they visit the district municipalities' websites. For instance, if a website does not provide multi-language options, including the mother tongue of persons, it is unlikely that they would be motivated to visit the website, especially if the persons are from rural areas and do not know English or French.

As shown previously (see Figure 6.14), the level of utilisation of online information and services is very low. Therefore, a question on additional access facilities was asked and the results helped to establish whether the lack of additional facilities could be associated with the low level of utilisation of e-government services. The results are summarised in Graph 6.22.



Graph 6.22: Appreciation of additional access facilities by the respondents

The results of Graph 6.22 show that additional access facilities are lacking on the district municipalities' websites. The majority affirm that the content of the district

municipalities' websites is predominantly presented in English and French and no translation mechanism is put in place. Also, a large number of respondents affirm that the district municipalities' websites do not provide options for people with disabilities. In addition, more respondents disagreed than agreed with the statement that the district municipality website provides the option to use mother tongue. Overall, it can be seen that the district municipalities' websites are lacking additional access facilities which can encourage citizens, especially those from rural areas, to use e-government services with ease. In order to find out whether the respondents' statements about additional facilities are true or not, the researcher visited and browsed the websites of the four selected district municipalities and it was found that what the respondents said was true to some extent. For instance, it was observed that the content on the websites of both the Kicukiro and Kamonyi district municipalities is 90 percent in the local language (Kinyarwanda only). Very little information and few official forms are presented in English. It was also observed that those in English take time to be opened or do not open at all. The websites of Kicukiro and Kamonyi do not provide links to other government websites for further search. Furthermore, it was observed that 95 percent of the content on the websites of the Lejweleputswa and Fezile Dabi district municipalities is presented in English, and this is a challenge for rural citizens who do not know or understand English.

Though the results of Graph 6.22 show that there is a problem of additional access facilities, they do not indicate whether there are significant differences between the four district municipalities. Therefore, a one-way ANOVA was run to determine the differences and three steps were followed.

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district, Normal Q-Q Plots were examined. For data to be normally distributed, the points on the graphs must approximately follow the diagonal line. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total Additional Access Facilities

Levene Statistic	df1	df2	Sig.
11.345	3	396	.000

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.000). For this reason, the result of the Welch ANOVA will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total Additional Access Facilities

	Statistic[a]	df1	df2	Sig.
Welch	20.933	3	213.946	.000

a. Asymptotically F distributed.

From the Sig. column it can be seen that there was a statistically significant difference in total additional access facilities scores somewhere between the different districts, Welch F (3, 213.946) = 20.933, p = 0.000. In order to determine between which districts the differences lay, the multiple comparisons table is inspected.

Table 6.28: Multiple comparisons on additional access facilities

Multiple Comparisons

Dependent Variable:

(I) I.1.1. Residence of the respondent			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Games-Howell	Lejweleputswa	Fezile Dabi	.39000	.32548	.629	-.4539	1.2339
		Kicukiro	-1.33000*	.27505	.000	-2.0426	-.6174
		Kamonyi	-1.37000*	.23549	.000	-1.9809	-.7591
	Fezile Dabi	Lejweleputswa	-.39000	.32548	.629	-1.2339	.4539
		Kicukiro	-1.72000*	.32507	.000	-2.5628	-.8772
		Kamonyi	-1.76000*	.29237	.000	-2.5198	-1.0002
	Kicukiro	Lejweleputswa	1.33000*	.27505	.000	.6174	2.0426
		Fezile Dabi	1.72000*	.32507	.000	.8772	2.5628
		Kamonyi	-.04000	.23493	.998	-.6494	.5694
	Kamonyi	Lejweleputswa	1.37000*	.23549	.000	.7591	1.9809
		Fezile Dabi	1.76000*	.29237	.000	1.0002	2.5198
		Kicukiro	.04000	.23493	.998	-.5694	.6494

*. The mean difference is significant at the 0.05 level.

It can be seen from the multiple comparisons table that there were significant differences in access to additional facilities between Lejweleputswa and Kicukiro (p=0.000), and also between Lejweleputswa and Kamonyi (p=0.000). From the descriptive table (Table 6.29), it can be seen that both Kamonyi (mean=18.60) and Kicukiro (mean=18.220) had higher additional access facilities than Lejweleputswa (mean = 16.890). Significant differences were also evident between Fezile Dabi and Kicukiro (p=0.000), and also between Fezile Dabi and Kamonyi (p=0.000). From the descriptive table (Table 6:29), it can be seen that Fezile Dabi had lower additional access facilities (mean = 16.50) than both Kicukiro (mean = 18.220) and Kamoyi (mean = 18.60).

Table 6.29: Comparison of mean on additional access facilities

Descriptives

Total Additional Access Facilities

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	16.8900	1.94830	.19483	16.5034	17.2766	13.00	22.00
Fezile Dabi	100	16.5000	2.60729	.26073	15.9827	17.0173	7.00	26.00
Kicukiro	100	18.2200	1.94147	.19415	17.8348	18.6052	15.00	23.00
Kamonyi	100	18.2600	1.32284	.13228	17.9975	18.5225	15.00	22.00
Total	400	17.4675	2.14837	.10742	17.2563	17.6787	7.00	26.00

6.2.7 Online services provided by the district municipalities' websites

As the sphere of government which is closest to the citizens, the local sphere of government is a canal through which central government ensures that services are provided and that citizens are satisfied. In today's information and knowledge society, citizens' expectations have changed and public information and services need to be provided online so that citizens can have access anytime and anywhere (24/7 basis). In this study, the researcher investigated the types of online information and services so far provided by district municipalities to citizens.

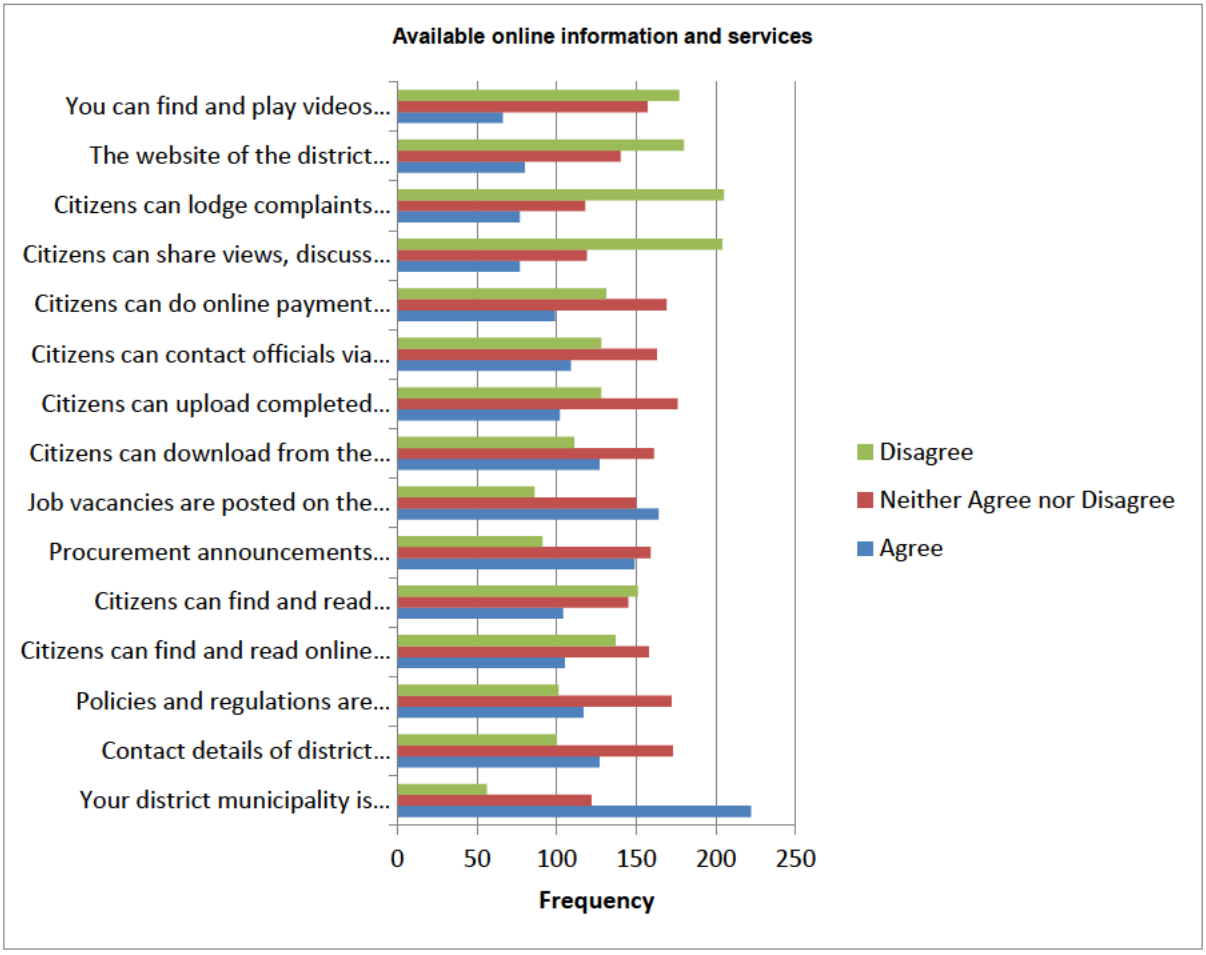
Table 6.30: Online information and services available on the district municipality's website

		South Africa				Rwanda							
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi					
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies		Total percentage	
Your district municipality is presently online (has a website (s).	Strongly Agree	22	22.0%	26	26.0%	16	16.0%	14	14.0%	78	222	19.5%	55.5
	Agree	36	36.0%	42	42.0%	34	34.0%	32	32.0%	144		36.0%	
	Neither Agree nor Disagree	29	29.0%	19	19.0%	48	48.0%	26	26.0%	122		30.5%	
	Disagree	9	9.0%	11	11.0%	2	2.0%	27	27.0%	49	56	12.2%	14.0
	Strongly Disagree	4	4.0%	2	2.0%	0	0.0%	1	1.0%	7		1.8%	
Contact details of the district municipality's officials and employees are well posted on the district municipality website	Strongly Agree	6	6.0%	4	4.0%	4	4.0%	8	8.0%	22	127	5.5%	31.7
	Agree	22	22.0%	27	27.0%	28	28.0%	28	28.0%	105		26.2%	
	Neither Agree nor Disagree	43	43.0%	48	48.0%	59	59.0%	23	23.0%	173		43.2%	
	Disagree	26	26.0%	20	20.0%	9	9.0%	41	41.0%	96	100	24.0%	25.0
	Strongly Disagree	3	3.0%	1	1.0%	0	0.0%	0	0.0%	4		1.0%	
Policies and regulations are available online	Strongly Agree	1	1.0%	5	5.0%	6	6.0%	7	7.0%	19	127	4.8%	31.8
	Agree	26	26.0%	24	24.0%	29	29.0%	29	29.0%	108		27.0%	
	Neither Agree nor Disagree	44	44.0%	50	50.0%	55	55.0%	23	23.0%	172		43.0%	
	Disagree	24	24.0%	19	19.0%	9	9.0%	41	41.0%	93	101	23.2%	25.2
	Strongly Disagree	5	5.0%	2	2.0%	1	1.0%	0	0.0%	8		2.0%	
Citizens can find and read online, all decisions taken by district municipality's organs	Strongly Agree	1	1.0%	4	4.0%	8	8.0%	7	7.0%	20	105	5.0%	26.2
	Agree	20	20.0%	10	10.0%	26	26.0%	29	29.0%	85		21.2%	
	Neither Agree nor Disagree	40	40.0%	41	41.0%	53	53.0%	24	24.0%	158		39.5%	
	Disagree	32	32.0%	37	37.0%	12	12.0%	40	40.0%	121	137	30.2%	34.2
	Strongly Disagree	7	7.0%	8	8.0%	1	1.0%	0	0.0%	16		4.0%	
Citizens can find online and read updated news and events related to the district municipality via its website	Strongly Agree	1	1.0%	4	4.0%	5	5.0%	5	5.0%	15	104	3.8%	26.0
	Agree	24	24.0%	7	7.0%	28	28.0%	30	30.0%	89		22.2%	
	Neither Agree nor Disagree	31	31.0%	39	39.0%	52	52.0%	23	23.0%	145		36.2%	
	Disagree	32	32.0%	30	30.0%	15	15.0%	42	42.0%	119	151	29.8%	37.8
	Strongly Disagree	12	12.0%	20	20.0%	0	0.0%	0	0.0%	32		8.0%	
Procurement announcements are available online	Strongly Agree	4	4.0%	9	9.0%	6	6.1%	6	6.0%	25	149	6.3%	37.4
	Agree	30	30.0%	32	32.0%	37	37.4%	25	25.0%	124		31.1%	
	Neither Agree nor Disagree	42	42.0%	41	41.0%	49	49.5%	27	27.0%	159		39.8%	
	Disagree	19	19.0%	14	14.0%	7	7.1%	42	42.0%	82	91	20.6%	22.9
	Strongly Disagree	5	5.0%	4	4.0%	0	0.0%	0	0.0%	9		2.3%	
Job vacancies are posted on the district municipality website and are up-to-date	Strongly Agree	4	4.0%	6	6.0%	6	6.0%	5	5.0%	21	164	5.2%	41.0
	Agree	38	38.0%	37	37.0%	38	38.0%	30	30.0%	143		35.8%	
	Neither Agree nor Disagree	35	35.0%	42	42.0%	50	50.0%	23	23.0%	150		37.5%	
	Disagree	13	13.0%	12	12.0%	6	6.0%	42	42.0%	73	86	18.2%	21.4
	Strongly Disagree	10	10.0%	3	3.0%	0	0.0%	0	0.0%	13		3.2%	

Citizens can download from the district municipality's website official forms	Strongly Agree	3	3.0%	6	6.0%	2	2.0%	5	5.1%	16	127	4.0%	31.8%
	Agree	28	28.0%	37	37 0%	20	20.0%	26	26.3%	111		27.8%	
	Neither Agree nor Disagree	37	37.0%	38	38 0%	59	59.0%	27	27.3%	161		40.4%	
	Disagree	24	24.0%	16	16 0%	17	17.0%	41	41.4%	98	111	24.6%	27.9%
	Strongly Disagree	8	8.0%	3	3.0%	2	2.0%	0	0.0%	13		3.3%	
Citizens can upload completed forms	Strongly Agree	2	2.0%	7	7.0%	1	1.0%	3	3.0%	13	102	3.2%	25.4%
	Agree	16	16.0%	30	30 0%	25	25.0%	18	18.0%	89		22.2%	
	Neither Agree nor Disagree	42	42.0%	43	43 0%	56	56.0%	35	35.0%	176		44.0%	
	Disagree	28	28.0%	15	15 0%	13	13.0%	43	43.0%	99	122	24.8%	30.6%
	Strongly Disagree	12	12.0%	5	5.0%	5	5.0%	1	1.0%	23		5.8%	
Citizens can contact officials via internet and can electronically interact with them	Strongly Agree	1	1.0%	5	5.0%	2	2.0%	3	3.0%	11	109	2.8%	27.3%
	Agree	28	28.0%	24	24 0%	27	27.0%	19	19.0%	98		24.5%	
	Neither Agree nor Disagree	43	43.0%	46	46 0%	52	52.0%	22	22.0%	163		40.8%	
	Disagree	17	17.0%	21	21 0%	12	12.0%	53	53.0%	103	128	25.8%	32.0%
	Strongly Disagree	11	11.0%	4	4.0%	7	7.0%	3	3.0%	25		6.2%	
Citizens can do online payment and other online transactions through the district municipality 's website	Strongly Agree	4	4.0%	7	7.0%	1	1.0%	3	3.0%	15	99	3.8%	24.9%
	Agree	36	36.0%	20	20 0%	13	13.1%	15	15.0%	84		21.1%	
	Neither Agree nor Disagree	36	36.0%	43	43 0%	64	64.6%	26	26.0%	169		42.4%	
	Disagree	12	12.0%	24	24 0%	15	15.2%	53	53.0%	104	131	26.1%	32.9%
	Strongly Disagree	12	12.0%	6	6.0%	6	6.1%	3	3.0%	27		6.8%	
Citizens can share views, discuss and give comments on district municipality's policies and programmes through district municipality's website	Strongly Agree	3	3.0%	5	5.0%	2	2.0%	3	3.0%	13	77	3.2%	19.2%
	Agree	22	22.0%	6	6.0%	16	16.0%	20	20.0%	64		16.0%	
	Neither Agree nor Disagree	34	34.0%	36	36 0%	31	31.0%	18	18.0%	119		29.8%	
	Disagree	29	29.0%	34	34 0%	35	35.0%	51	51.0%	149	204	37.2%	51.0%
	Strongly Disagree	12	12.0%	19	19 0%	16	16.0%	8	8.0%	55		13.8%	
Citizens can lodge complaints against misconduct of district municipality's officials, corrupt practices and mismanagement via district municipality's website	Strongly Agree	1	1.0%	4	4.0%	0	0.0%	1	1.0%	6	77	1.5%	19.3%
	Agree	25	25.0%	6	6.0%	15	15.0%	25	25.0%	71		17.8%	
	Neither Agree nor Disagree	30	30.0%	36	36 0%	29	29.0%	23	23.0%	118		29.5%	
	Disagree	25	25.0%	34	34 0%	38	38.0%	49	49.0%	146	205	36.5%	51.3%
	Strongly Disagree	19	19.0%	20	20 0%	18	18.0%	2	2.0%	59		14.8%	
The website of the district municipality provides educative information on drug abuse, gender equality, HIV/AIDS, child abuse or family violence.	Strongly Agree	1	1.0%	3	3.0%	2	2.0%	1	1.0%	7	80	1.8%	20.0%
	Agree	23	23.0%	6	6.0%	21	21.0%	23	23.0%	73		18.2%	
	Neither Agree nor Disagree	27	27.0%	32	32 0%	54	54.0%	27	27.0%	140		35.0%	
	Disagree	33	33.0%	40	40 0%	18	18.0%	48	48.0%	139	180	34.8%	45.0%
	Strongly Disagree	16	16.0%	19	19 0%	5	5.0%	1	1.0%	41		10.2%	
You can find and play videos from the district municipality's website	Strongly Agree	1	1.0%	3	3.0%	2	2.0%	1	1.0%	7	66	1.8%	16.6%
	Agree	8	8.0%	7	7.0%	21	21.0%	23	23.0%	59		14.8%	
	Neither Agree nor Disagree	49	49.0%	31	31 0%	50	50.0%	27	27.0%	157		39.2%	
	Disagree	31	31.0%	34	34 0%	23	23.0%	47	47.0%	135	177	33.8%	44.3%
	Strongly Disagree	11	11.0%	25	25 0%	4	4.0%	2	2.0%	42		10.5%	

The results of Table 6.30 show two major findings:

The first is that a large number of respondents did not agree or disagree with different proposed items regarding the availability of online information and services. They are the respondents who were not aware of the existence of the district municipalities' websites and who had no knowledge of information and services posted on the district municipalities' websites. The second is that more respondents disagreed than agreed with different proposed items on the availability of online information and services. This reveals the low level of appreciation by the respondents regarding the availability of online information and services at the district municipalities' websites. The results of Table 6.30 are expanded on more in Graph 6.23.



Graph 6.23: Available online information and services on the district municipality's website

Overall, the results of Graph 6.23 show the following findings:

- The majority of the respondents do not know what is available or posted on the district municipalities' websites. This emphasises the challenge of the lack of awareness by citizens.
- The results show that online participation by citizens is very difficult, even impossible, as the majority of the respondents admitted that they cannot lodge complaints against misconduct of district officials and corrupt practices. Again, the respondents declared that citizens cannot share views, discuss and comment on a district municipality's policies and programmes *via* the internet. Furthermore, a significant number of the respondents admitted that they cannot contact district municipality officials nor interact with them *via* the internet. As indicated in Chapter 1 of the study, the lack or low level of citizens' participation in the affairs that concern them is one of the contributing causes of community dissatisfaction and community protests in South Africa (Karamoko & Jain 2011). In addition, problems of corruption, embezzlement of public money, lack of transparency and nepotism are to some extent due to the lack of community participation in the local affairs that affect citizens.
- The respondents agree that general information such as the contact details of the district municipality officials, job advertisements, and tender announcements can be accessed when the district municipality's website is visited.
- A significant number of respondents disagree with the existence of educative information on drug abuse, child abuse, HIV/AIDS, etc. on district municipalities' websites. However, this is the kind of information the community needs. During the survey in the field, a respondent from the Kamonyi district in Rwanda commented and said: "*In this district, we are mostly farmers and we don't have information about modern technology regarding farming, like irrigation and how to multiply seeds. Therefore, if we are sure that we can find such kind of information on the district municipality's website, we will all visit the website*". In this regard, the researcher argues that posting information on the district municipality's website is one thing, but

posting relevant information that the community needs is quite another, and therefore more important.

- The results show that online transactions (paying fines or paying for any other services *via* the internet) are practically impossible as indicated by the respondents, especially in Rwanda. It does not serve any purpose if a person can find and download the official form from the district municipality's website but they have to go to the bank for payment and then have to physically submit (go to the offices) the completed forms and proof of payment.
- A small number of respondents from both countries admitted that there are official downloadable forms, but those forms cannot be completed online and uploaded.

Taking into consideration the four stages of e-government maturity (see Chapter 2), it can be seen that the e-government maturity of the district municipalities is still at a very low level. The analysis of the websites by the researcher showed that the maturity level of e-government of most of the selected district municipalities is at stage one (emerging information services at 95 %) and stage two (enhanced information services at 5 %). It was found that the official information, government documents, government policies, job and tender announcements, contact details of the district municipalities' officials and general news were posted on the district municipalities' websites, but were not regularly updated. Again, it was found that some of the official forms can be downloaded from the district municipalities' websites, but cannot be filled in and submitted online. Furthermore, it was found that two-way communication between citizens and district officials *via* the internet is almost impossible as e-mails are not replied to and no feedback is given to citizens' comments. The detailed results of the researcher's evaluation of the district websites are presented in Table 6.31.

Table 6.31: Evaluation of online services available on the district municipalities' websites

	South Africa				Rwanda			
	Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi	
	Yes	No	Yes	No	Yes	No	Yes	No
Availability of the district municipality website	✓		✓		✓		✓	
Contact details of district officials online	✓		✓		✓		✓	
Online databases and archives in various formats	✓			×	✓			×
Multi-lingual options		×		×		×		×
Downloadable application forms	✓		✓		✓		✓	
Ability to make appointments online		×		×		×		×
Ability to pay for services online		×		×		×		×
Ability to upload the completed forms online		×		×		×		×
Content on the website is updated frequently		×		×	✓			×
Published information (officials reports, newsletters, events) online	✓		✓		✓			×
Laws, policies and council resolutions online	✓		✓		✓		✓	
Website links to other government departments	✓		✓			×		×
Job and tender announcements online	✓		✓		✓		✓	
Online consultation and online participation		×		×		×		×
Availability of social networks (Facebook, Twitter and others)	✓		✓		✓		✓	

From Table 6.31 it can be seen that 95 percent of the content of the selected district municipalities' websites are predominantly informational (stage 1 of e-government maturity) rather than interactive and transactional (stages 2, 3 and 4).

Though the results of Graph 6.23 show the information and services which can be accessed online by citizens, they do not show whether or not there are differences between the district municipalities. Therefore, a one-way ANOVA was done to compare the different district municipalities. Questions were recoded so that a higher score was indicative of greater availability of online services. The one-way ANOVA was run in three steps:

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district, Normal Q-Q Plots were examined. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total online info and services available

Levene Statistic	df1	df2	Sig.
17.132	3	396	.000

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.010). For this reason, the result of the Welch ANOVA will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total online info and services available

	Statistic[a]	df1	df2	Sig.
Welch	3.854	3	216.221	.010

a. Asymptotically F distributed.

From the Sig. column it can be seen that there was a statistically significant difference in the availability of online services and information somewhere between the different district municipalities, Welch F (3, 216.221) = 3.854, p = 0.010. In order to determine exactly between which of the different district municipalities these differences lay, the multiple comparisons table (Table 6.31) is consulted.

Table 6.32: Multiple comparisons on the availability of online information and services

Multiple Comparisons

Dependent Variable:

(I) Residence of the respondent			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Games-Howell	Lejweleputswa	Fezile Dabi	-.24000	1.22212	.997	-3.4066	2.9266
		Kicukiro	-2.93000*	1.10928	.044	-5.8062	-.0538
		Kamonyi	.33000	1.48169	.996	-3.5116	4.1716
	Fezile Dabi	Lejweleputswa	.24000	1.22212	.997	-2.9266	3.4066
		Kicukiro	-2.69000	1.06719	.060	-5.4563	.0763
		Kamonyi	.57000	1.45045	.979	-3.1916	4.3316
	Kicukiro	Lejweleputswa	2.93000*	1.10928	.044	.0538	5.8062
		Fezile Dabi	2.69000	1.06719	.060	-.0763	5.4563
		Kamonyi	3.26000	1.35673	.081	-.2635	6.7835
	Kamonyi	Lejweleputswa	-.33000	1.48169	.996	-4.1716	3.5116
		Fezile Dabi	-.57000	1.45045	.979	-4.3316	3.1916
		Kicukiro	-3.26000	1.35673	.081	-6.7835	.2635

*. The mean difference is significant at the 0.05 level.

From Table 6.32, it can be seen that there were significant differences in the availability of online information and services only between Lejweleputswa and Kicukiro (p=0.044). From the descriptive table (Table 6.33), it can be seen that Kicukiro had greater availability of online information and services (mean = 46.370) than Fezile Dabi (mean=43.680) and Lejweleputswa (mean = 43.440).

Table 6.33: Comparison of mean on online services available on the district municipalities' websites

Descriptives

Total online info services available

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	43.4400	8.90275	.89028	41.6735	45.2065	18.00	65.00
Fezile Dabi	100	43.6800	8.37249	.83725	42.0187	45.3413	17.00	69.00
Kicukiro	100	46.3700	6.61748	.66175	45.0569	47.6831	32.00	69.00
Kamonyi	100	43.1100	11.84402	1.18440	40.7599	45.4601	28.00	72.00
Total	400	44.1500	9.18796	.45940	43.2469	45.0531	17.00	72.00

The results of the one-way ANOVA are not different from the analysis of the district municipalities' websites by the researcher. It was found that citizens can find and benefit from diverse online information posted on the website of the Kicukiro district. News on events in the district are regularly posted and updated. More than 10 different types of official forms can be downloaded. In addition, all services at the district municipality of Kicukiro are automated through strong information systems. Some information systems were put in place for online service delivery such as:

- ***Document Tracking and Workflow Management System (DTWMS)***

This system is used to manage incoming and outgoing mails and automate the flow of mails to different services or units.

- ***Kigali Construction Permit Management Information System(KCPMIS)***

The system deals with construction permit administration and other related permits (occupation permit, renovation permit and change of use permit). A citizen can apply online. However, the payment process is not done electronically. Individuals need to go to the bank, get the slip and physically submit proof of payment.

- ***Land administration Information System (LAIS).***

It is a system which allows someone to apply online for a land certificate. However, the system does not allow one to do all the transactions online. It still not operating as it should.

6.2.8 Appreciation of the impact of utilisation of e-government by the district municipalities

The effective utilisation of e-government by the district municipalities can have several positive impacts. Various researchers, namely Basu (2004); Alshawi and Alalwany (2009); Moon (2002); Shareef *et al*. (2010); Evans and Yen (2006); Mattesson and Jaeger (2009); Kroukamp (2005); Dzidonu (2011); and Okemwa and Majanja (2009) indicate that the use of e-government by local spheres of government can have the following positive effects:

- Full utilisation of e-government by the district municipality allows citizens to get cheaper and quality services. There is no longer any need for citizens to travel, spend money and time in long queues to obtain public information and services;
- The use of e-government by the district municipality helps to reduce administrative procedures and bureaucracy. It enables the district municipality to increase transparency and thus decrease the possibility of maladministration and corruption;
- The utilisation of e-government by the district municipality enables citizens to participate directly in governance by influencing policy decisions. Therefore, the increased power of citizens may influence the district municipality to operate in a more transparent and accountable manner; and
- The utilisation of e-government by the district municipality enhances the district municipality's responsiveness. Through two-way communication between public officials and citizens a district municipality can identify the needs and priorities of citizens, and consequently provide them with programmes and services specific to their needs.

Taking into consideration the above positive impacts of e-government on service delivery, the respondents were asked to give their appreciation of the benefits derived thus far from the utilisation of e-government by their district municipalities.

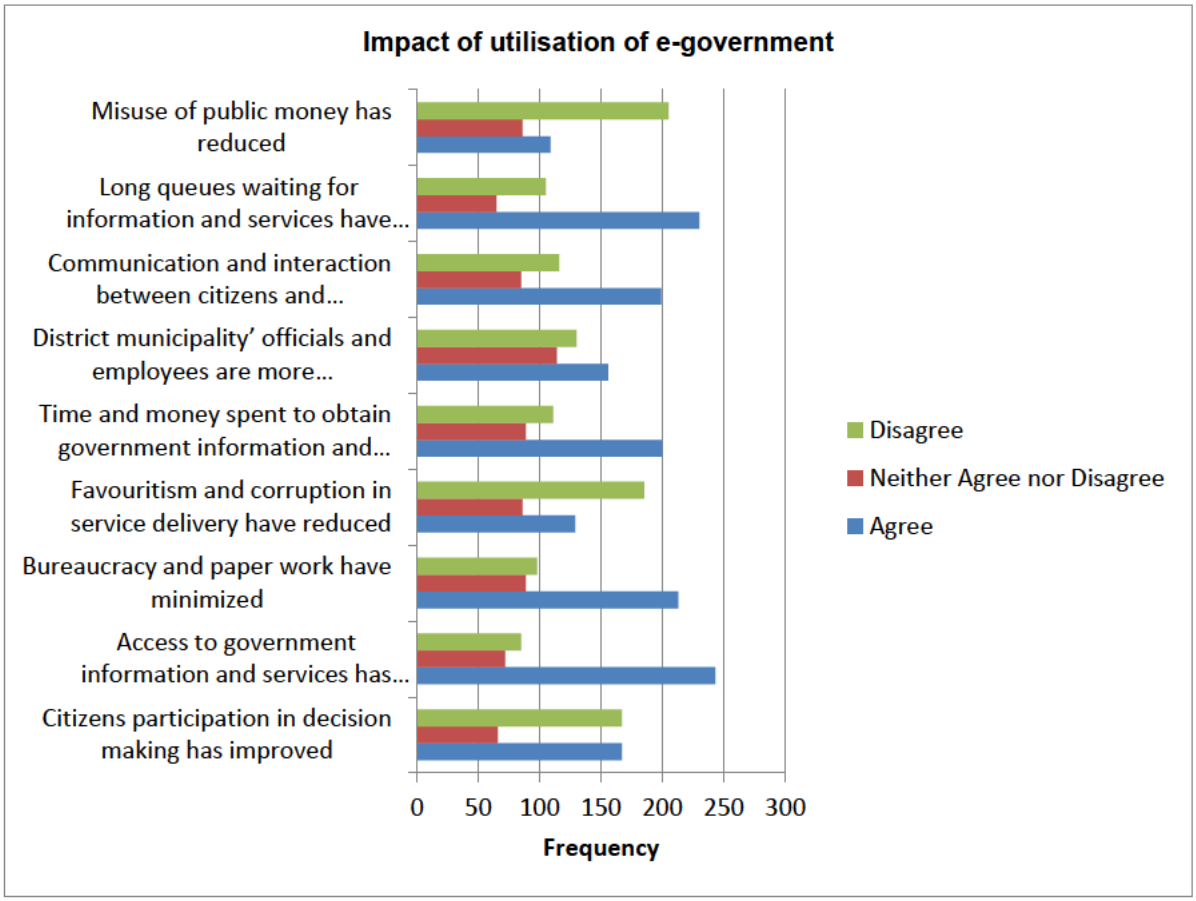
Table 6.34: Observed benefits or impacts of the utilisation of e-government by the district municipalities

		South Africa				Rwanda							
		Lejweleputswa		Fazile Dabi		Kicukiro		Kamonyi					
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies		Total percentages	
Citizens participation in decision making has improved	Strongly Agree	14	14.0%	4	4.0%	6	6.0%	7	7.0%	31	167	7.8%	41.8%
	Agree	39	39.0%	36	36.0%	30	30.0%	31	31.0%	136		34.0%	
	Neither Agree nor Disagree	12	12.0%	21	21.0%	20	20.0%	13	13.0%	66		16.5%	
	Disagree	31	31.0%	37	37.0%	41	41.0%	49	49.0%	158	167	39.5%	41.7%
	Strongly Disagree	4	4.0%	2	2.0%	3	3.0%	0	0.0%	9		2.2%	
Access to government information and services has improved	Strongly Agree	13	13.0%	10	10.0%	9	9.0%	6	6.0%	38	243	9.5%	60.7%
	Agree	48	48.0%	57	57.0%	54	54.0%	46	46.0%	205		51.2%	
	Neither Agree nor Disagree	16	16.0%	16	16.0%	28	28.0%	12	12.0%	72		18.0%	
	Disagree	19	19.0%	16	16.0%	9	9.0%	36	36.0%	80	85	20.0%	21.2%
	Strongly Disagree	4	4.0%	1	1.0%	0	0.0%	0	0.0%	5		1.2%	
Bureaucracy and paper work have minimized	Strongly Agree	8	8.0%	5	5.0%	7	7.0%	3	3.0%	23	213	5.8%	53.3%
	Agree	47	47.0%	45	45.0%	54	54.0%	44	44.0%	190		47.5%	
	Neither Agree nor Disagree	24	24.0%	30	30.0%	24	24.0%	11	11.0%	89		22.2%	
	Disagree	15	15.0%	19	19.0%	14	14.0%	41	41.0%	89	98	22.2%	24.4%
	Strongly Disagree	6	6.0%	1	1.0%	1	1.0%	1	1.0%	9		2.2%	
Favouri ism and corruption in service delivery have reduced	Strongly Agree	3	3.0%	3	3.0%	6	6.0%	4	4.0%	16	129	4.0%	32.2%
	Agree	18	18.0%	34	34.0%	30	30.0%	31	31.0%	113		28.2%	
	Neither Agree nor Disagree	19	19.0%	22	22.0%	30	30.0%	15	15.0%	86		21.5%	
	Disagree	42	42.0%	37	37.0%	28	28.0%	49	49.0%	156	185	39.0%	46.2%
	Strongly Disagree	18	18.0%	4	4.0%	6	6.0%	1	1.0%	29		7.2%	
Time and money spent to obtain government information and services has reduced	Strongly Agree	7	7.0%	10	10.0%	8	8.0%	4	4.0%	29	200	7.2%	50.0%
	Agree	42	42.0%	38	38.0%	47	47.0%	44	44.0%	171		42.8%	
	Neither Agree nor Disagree	28	28.0%	27	27.0%	26	26.0%	8	8.0%	89		22.2%	
	Disagree	12	12.0%	22	22.0%	17	17.0%	44	44.0%	95	111	23.8%	27.8%
	Strongly Disagree	11	11.0%	3	3.0%	2	2.0%	0	0.0%	16		4.0%	
District municipality' officials and employees are more transparent and more accountable	Strongly Agree	3	3.0%	5	5.0%	10	10.0%	1	1.0%	19	156	4.8%	39.0%
	Agree	25	25.0%	29	29.0%	36	36.0%	47	47.0%	137		34.2%	
	Neither Agree nor Disagree	40	40.0%	35	35.0%	29	29.0%	10	10.0%	114		28.5%	
	Disagree	22	22.0%	27	27.0%	21	21.0%	42	42.0%	112	130	28.0%	32.5%
	Strongly Disagree	10	10.0%	4	4.0%	4	4.0%	0	0.0%	18		4.5%	
Communication and interaction between citizens and municipality's officials has improved	Strongly Agree	4	4.0%	19	19.0%	10	10.0%	3	3.0%	36	199	9.0%	49.8%
	Agree	50	50.0%	43	43.0%	36	36.0%	34	34.0%	163		40.8%	
	Neither Agree nor Disagree	24	24.0%	16	16.0%	29	29.0%	16	16.0%	85		21.2%	
	Disagree	17	17.0%	19	19.0%	23	23.0%	46	46.0%	105	116	26.2%	29.0%
	Strongly Disagree	5	5.0%	3	3.0%	2	2.0%	1	1.0%	11		2.8%	
Long queues waiting for information and services have reduced	Strongly Agree	13	13.0%	11	11.0%	12	12.0%	7	7.0%	43	230	10.8%	57.6%
	Agree	55	55.0%	51	51.0%	40	40.0%	41	41.0%	187		46.8%	
	Neither Agree nor Disagree	19	19.0%	17	17.0%	20	20.0%	9	9.0%	65		16.2%	
	Disagree	10	10.0%	19	19.0%	25	25.0%	42	42.0%	96	105	24.0%	26.2%
	Strongly Disagree	3	3.0%	2	2.0%	3	3.0%	1	1.0%	9		2.2%	
Misuse of public money has reduced	Strongly Agree	10	10.0%	7	7.0%	5	5.0%	3	3.0%	25	109	6.2%	27.2%
	Agree	16	16.0%	19	19.0%	22	22.0%	27	27.0%	84		21.0%	
	Neither Agree nor Disagree	13	13.0%	26	26.0%	31	31.0%	16	16.0%	86		21.5%	
	Disagree	33	33.0%	30	30.0%	36	36.0%	53	53.0%	152	205	38.0%	51.2%
	Strongly Disagree	28	28.0%	18	18.0%	6	6.0%	1	1.0%	53		13.2%	

Overall the results of Table 6.34 show that according to the respondents the impact of the utilisation of e-government by the district municipalities is still insignificant or minimal. However, the respondents recognise small improvements in the following:

- 57.6% of respondents affirm that the long queues waiting for public information and services have been reduced. However, the researcher argues that this was not because citizens are using the internet to get what they want from the district municipalities' websites but because of the utilisation of mobile devices. During the survey in the field, a respondent commented and said: "*The utilisation of technology such as mobile phones is helping me to save money and time. For example, if I want some information or services from the municipality, I first call to find out if the official who I need is in or out of office and then I make an appointment instead of going and waiting at municipality's offices*". Another respondent said: "*The toll free number provided is helping us get information without moving from home. However, the issue is that often you can call those numbers and not get an answer or the numbers are busy all the time*".
- 60.7% of respondents affirm that access to government information and services has improved. Nowadays citizens who are able to visit the district municipalities' websites can access public information.
- 53.3% of respondents affirm that bureaucracy and paperwork have been minimised. The utilisation of computers by district municipalities and the automation of administrative activities have reduced bureaucracy and paperwork.

The results of Graph 6.24 expand more on the results of Table 6.34.



Graph 6.24: Appreciation of the impact of the utilisation of e-government by district municipality

The results of Graph 6.24 show the domains or areas where improvements are observed and the domains where a small impact is observed. The majority of the respondents strongly disagree with the statement that the misuse of public money has been reduced. They declare that despite the use of ICT, public officials are still misusing public money. In addition, a large number of the respondents strongly disagree with the statement that favouritism and corruption in public service delivery have been reduced.

The impact of e-government on the reduction of corruption was debated and many believe that the utilisation of ICT in the public sector significantly reduces the malpractices such as corruption and embezzlement. However, the researcher supports the idea that the utilisation of ICT alone cannot eradicate corruption practices in local spheres of government because the fight against corruption demands multi-dimensional approaches. In this regard, Dzidonu (2011:23) argues that the myth of computer omnipotence makes some managers assume that ICT

removes the opportunities for corruption. Therefore, they may fail to institute controls on computerised systems and thus give room to corrupt practices in the public sector.

During the survey in the field it was found that the impact of ICT which citizens appreciate most is the use of mobile phones, especially mobile money services. These services allow users to withdraw and send cash from one mobile phone user to another, using local retailers and trading stores as ATMs. This mobile payment revolution changed the ways of paying or being paid and helped citizens in remote areas to transfer money between them and to pay for services. For instance, six million Rwandans are using Mobile Money and more than 700 billion Rwandan Francs were transacted via Mobile Money (Tumwebaze 2015: online). Through the Mobile Money platform citizens can pay for electricity bills, water bills and health insurance. It was found, however, that this Mobile Money platform is not yet well known and largely practiced in South Africa.

Though the results of Graph 6.24 show the level of appreciation of the impact of e-government on service delivery, they do not indicate whether there are significant differences between the district municipalities. In order to compare different district municipalities, the Likert scale table was summed to obtain a total score of impact on service delivery. Questions were recoded so that a higher score was indicative of greater impact. A one-way ANOVA was run and three steps were followed:

a. Determining if data are normally distributed

In order to determine whether data were normally distributed within each district, Normal Q-Q Plots were examined. The Normal Q-Q plots showed that the data were approximately normally distributed.

b. Testing the assumption of homogeneity of variances

Test of Homogeneity of Variances

Total Impact on Service Delivery

Levene Statistic	df1	df2	Sig.
7.363	3	396	.000

The assumption of homogeneity of variance as assessed by Levene's test for equal variances was violated (p=0.000). For this reason, the result of the Welch ANOVA

will be interpreted, and Games-Howell post-hoc tests will be consulted in the case of a significant result.

c. Results of the one-way ANOVA

Robust Tests of Equality of Means

Total Impact on Service Delivery

	Statistic[a]	df1	df2	Sig.
Welch	1.973	3	219.145	.119

a. Asymptotically F distributed.

From the Sig. column it can be seen that there was no statistically significant difference in the perceived or expected impact of e-government on service delivery between different district municipalities, Welch F (3, 219.145) = 1.973, p = 0.119. Thus, the districts did not differ from each other in terms of the perceived or expected impact of the utilisation of e-government on service delivery. This can be seen by the mean scores in the descriptive table (Table 6.35) being very similar between the different district municipalities.

Table 6.35: Comparison of mean scores on the impact of e-government

Descriptives

Total Impact service delivery

District municipality	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Lejweleputswa	100	28.1100	6.59491	.65949	26.8014	29.4186	9.00	45.00
Fazile Dabi	100	28.9800	6.35321	.63532	27.7194	30.2406	9.00	45.00
Kicukiro	100	29.2700	5.88588	.58859	28.1021	30.4379	14.00	45.00
Kamonyi	100	27.0900	7.73304	.77330	25.5556	28.6244	16.00	43.00
Total	400	28.3625	6.70548	.33527	27.7034	29.0216	9.00	45.00

6.2.9 Barriers to effective utilisation of e-government at local sphere of government

The effective utilisation of e-government at the local sphere of government needs action and effort from two sides: the supply side (district municipality) and the demand side (citizens). The actions and efforts of both sides can be limited by different barriers or constraints. Therefore, the study investigated the barriers to effective utilisation of e-government by both sides because the lack in effort or failure on one side negatively affects the efforts made by the other side. Consequently, any strategy for improvement needs to tackle the barriers on both sides.

6.2.9.1 Barriers to effective utilisation of e-government by the selected district municipalities

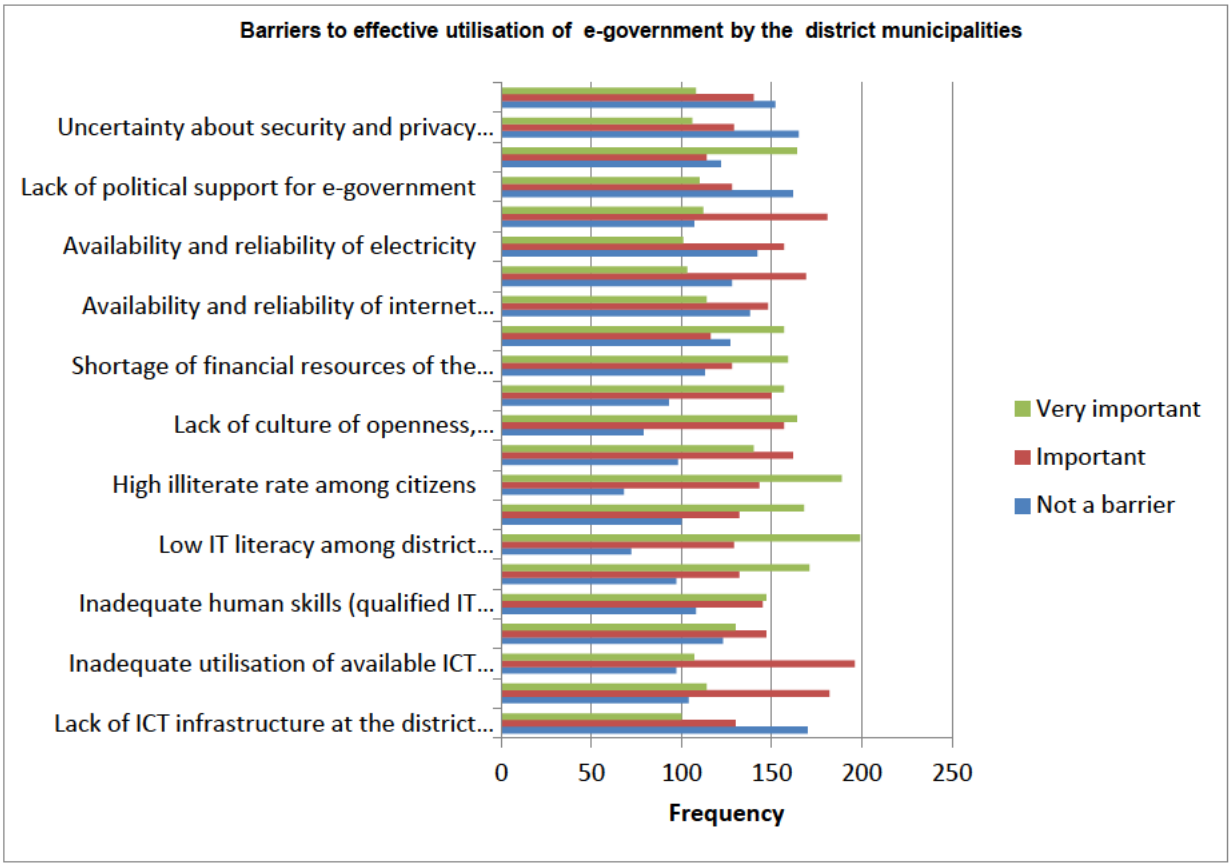
The results of Table 6.36 below show the following major findings:

- Lack of ICT infrastructure was considered more a barrier in Lejweleputswa and Fezile Dabi than in the Kamonyi and Kicukiro district municipalities;
- Inadequate utilisation of ICT tools was declared a very important barrier in Fezile Dabi and Lejweleputswa, more so than in Kicukiro and Kamonyi;
- Low computer literacy among local officials was declared an important and very important barrier in Lejweleputswa and Fezile Dabi, more so than in Kicukiro and Kamonyi;
- Culture of corruption and favouritism was declared a very important barrier in Lejweleputswa and Kicukiro, more so than in Fezile Dabi and Kamonyi;
- Shortage of financial resources was considered more an important barrier in Kamonyi and Fezile Dabi than in Kicukiro and Lejweleputswa;
- Availability and reliability of electricity was declared a very important barrier in Kamonyi and Kicukiro, more so than in Lejweleputswa and Fezile Dabi; and
- Availability and reliability of internet connection was declared a very important barrier in Kicukiro and Kamonyi, more so than in Fezile Dabi and Lejweleputswa.

Table 6.35: Barriers to effective utilisation of e-government by the district municipalities

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
Lack of ICT infrastructure at the district municipality level	Not a barrier	47	47.0%	43	43.0%	43	43.0%	37	37.0%	170	42.5%
	Important	24	24.0%	43	43.0%	31	31.0%	32	32.0%	130	32.5%
	Very important	29	29.0%	14	14.0%	26	26.0%	31	31.0%	100	25.0%
Inadequate ICT infrastructure of the district municipality	Not a barrier	33	33.0%	28	28.0%	22	22.0%	21	21.0%	104	26.0%
	Important	39	39.0%	50	50.0%	46	46.0%	47	47.0%	182	45.5%
	Very important	28	28.0%	22	22.0%	32	32.0%	32	32.0%	114	28.5%
Inadequate utilisation of available ICT tools	Not a barrier	23	23.0%	15	15.0%	19	19.0%	40	40.0%	97	24.2%
	Important	45	45.0%	61	61.0%	50	50.0%	40	40.0%	196	49.0%
	Very important	32	32.0%	24	24.0%	31	31.0%	20	20.0%	107	26.8%
Resistance and fear of change by district municipality officials	Not a barrier	19	19.0%	14	14.0%	35	35.0%	55	55.0%	123	30.8%
	Important	45	45.0%	39	39.0%	38	38.0%	25	25.0%	147	36.8%
	Very important	36	36.0%	47	47.0%	27	27.0%	20	20.0%	130	32.5%
Inadequate human skills (qualified IT staff)	Not a barrier	18	18.0%	16	16.0%	30	30.0%	44	44.0%	108	27.0%
	Important	40	40.0%	33	33.0%	41	41.0%	31	31.0%	145	36.2%
	Very important	42	42.0%	51	51.0%	29	29.0%	25	25.0%	147	36.8%
High level of turnover of IT professionals who resign from district municipality to	Not a barrier	10	10.0%	2	2.0%	40	40.0%	45	45.0%	97	24.2%
	Important	40	40.0%	44	44.0%	26	26.0%	22	22.0%	132	33.0%
	Very important	50	50.0%	54	54.0%	34	34.0%	33	33.0%	171	42.8%
Low IT literacy among district municipality officials	Not a barrier	8	8.0%	7	7.0%	33	33.0%	24	24.0%	72	18.0%
	Important	29	29.0%	34	34.0%	32	32.0%	34	34.0%	129	32.2%
	Very important	63	63.0%	59	59.0%	35	35.0%	42	42.0%	199	49.8%
Low computer literacy among district municipality officials	Not a barrier	10	10.0%	12	12.0%	39	39.0%	39	39.0%	100	25.0%
	Important	38	38.0%	39	39.0%	27	27.0%	28	28.0%	132	33.0%
	Very important	52	52.0%	49	49.0%	34	34.0%	33	33.0%	168	42.0%
High illiterate rate among citizens	Not a barrier	25	25.0%	13	13.0%	7	7.0%	23	23.0%	68	17.0%
	Important	40	40.0%	33	33.0%	39	39.0%	31	31.0%	143	35.8%
	Very important	35	35.0%	54	54.0%	54	54.0%	46	46.0%	189	47.2%
Reluctance to share information with the citizens and between district	Not a barrier	29	29.0%	31	31.0%	10	10.0%	28	28.0%	98	24.5%
	Important	40	40.0%	35	35.0%	53	53.0%	34	34.0%	162	40.5%
	Very important	31	31.0%	34	34.0%	37	37.0%	38	38.0%	140	35.0%
Lack of culture of openness, transparency and accountability	Not a barrier	14	14.0%	16	16.0%	14	14.0%	35	35.0%	79	19.8%
	Important	45	45.0%	46	46.0%	45	45.0%	21	21.0%	157	39.2%
	Very important	41	41.0%	38	38.0%	41	41.0%	44	44.0%	164	41.0%
Culture of corruption and favouritism	Not a barrier	20	20.0%	22	22.0%	21	21.0%	30	30.0%	93	23.2%
	Important	44	44.0%	37	37.0%	34	34.0%	35	35.0%	150	37.5%
	Very important	36	36.0%	41	41.0%	45	45.0%	35	35.0%	157	39.2%
Shortage of financial resources of the district municipality	Not a barrier	32	32.0%	23	23.0%	33	33.0%	25	25.0%	113	28.2%
	Important	31	31.0%	38	38.0%	31	31.0%	28	28.0%	128	32.0%
	Very important	37	37.0%	39	39.0%	36	36.0%	47	47.0%	159	39.8%
Lack of knowledge by district municipality officials about e-government services	Not a barrier	31	31.0%	39	39.0%	27	27.0%	30	30.0%	127	31.8%
	Important	25	25.0%	25	25.0%	36	36.0%	30	30.0%	116	29.0%
	Very important	44	44.0%	36	36.0%	37	37.0%	40	40.0%	157	39.2%
Availability and reliability of internet connection	Not a barrier	49	49.0%	49	49.0%	18	18.0%	22	22.0%	138	34.5%
	Important	26	26.0%	38	38.0%	42	42.0%	42	42.0%	148	37.0%
	Very important	25	25.0%	13	13.0%	40	40.0%	36	36.0%	114	28.5%
Lack of citizens' interest due to cultural values	Not a barrier	47	47.0%	47	47.0%	17	17.0%	17	17.0%	128	32.0%
	Important	35	35.0%	41	41.0%	43	43.0%	50	50.0%	169	42.2%
	Very important	18	18.0%	12	12.0%	40	40.0%	33	33.0%	103	25.8%
Availability and reliability of electricity	Not a barrier	50	50.0%	44	44.0%	28	28.0%	20	20.0%	142	35.5%
	Important	36	36.0%	42	42.0%	41	41.0%	38	38.0%	157	39.2%
	Very important	14	14.0%	14	14.0%	31	31.0%	42	42.0%	101	25.2%
High cost of internet	Not a barrier	38	38.0%	27	27.0%	16	16.0%	26	26.0%	107	26.8%
	Important	45	45.0%	55	55.0%	43	43.0%	38	38.0%	181	45.2%
	Very important	17	17.0%	18	18.0%	41	41.0%	36	36.0%	112	28.0%
Lack of political support for e-government	Not a barrier	39	39.0%	33	33.0%	37	37.0%	53	53.0%	162	40.5%
	Important	39	39.0%	47	47.0%	30	30.0%	12	12.0%	128	32.0%
	Very important	22	22.0%	20	20.0%	33	33.0%	35	35.0%	110	27.5%
E-government application and system not initiated locally but imported from outside	Not a barrier	16	16.0%	23	23.0%	28	28.0%	55	55.0%	122	30.5%
	Important	40	40.0%	25	25.0%	36	36.0%	13	13.0%	114	28.5%
	Very important	44	44.0%	52	52.0%	36	36.0%	32	32.0%	164	41.0%
Uncertainty about security and privacy of e-government websites	Not a barrier	39	39.0%	24	24.0%	45	45.0%	57	57.0%	165	41.2%
	Important	39	39.0%	53	53.0%	23	23.0%	14	14.0%	129	32.2%
	Very important	22	22.0%	23	23.0%	32	32.0%	29	29.0%	106	26.5%
Donor funding dependency	Not a barrier	36	36.0%	22	22.0%	36	36.0%	58	58.0%	152	38.0%
	Important	38	38.0%	60	60.0%	28	28.0%	14	14.0%	140	35.0%
	Very important	26	26.0%	18	18.0%	36	36.0%	28	28.0%	108	27.0%

Overall, it was found that barriers related to ICT infrastructure and funds such as lack of ICT infrastructure, inadequate ICT infrastructure and shortage of financial resources were considered by the respondents as very important and important barriers in Kamonyi and Kicukiro more so than in Lejweleputswa and Fezile Dabi. However, barriers related to management and moral values such as inadequate utilisation of available ICT tools, ICT literacy among local officials, corruption and favouritism were considered to be very important and important barriers in Lejweleputswa and Fezile Dabi more so than in Kicukiro and Kamonyi



Graph 6.25: Barriers to effective utilisation of e-government by the district municipalities

The results of Graph 6.25 show the barriers which were considered to be very important, namely low computer literacy among district municipality officials; high illiteracy rate of citizens; high turnover of IT specialists who resign from local government to the private sector; and e-government applications and systems not initiated locally but imported from outside. The results also show the barriers which are considered to be important, namely inadequate utilisation of available ICT tools; inadequate ICT infrastructure of district municipalities; high cost of the internet; lack

of citizens' interest and support; and inadequate electricity. In addition, the results show barriers which overall are not considered to be barriers at all, such as lack of ICT infrastructure; lack of political support for e-government; uncertainty about security and privacy of e-government; and donor funding dependency.

6.2.9.2 Barriers to effective utilisation of e-government services by citizens

The utilisation of e-government services by citizens may be hindered by different barriers. The results of Table 6.37 below show those barriers.

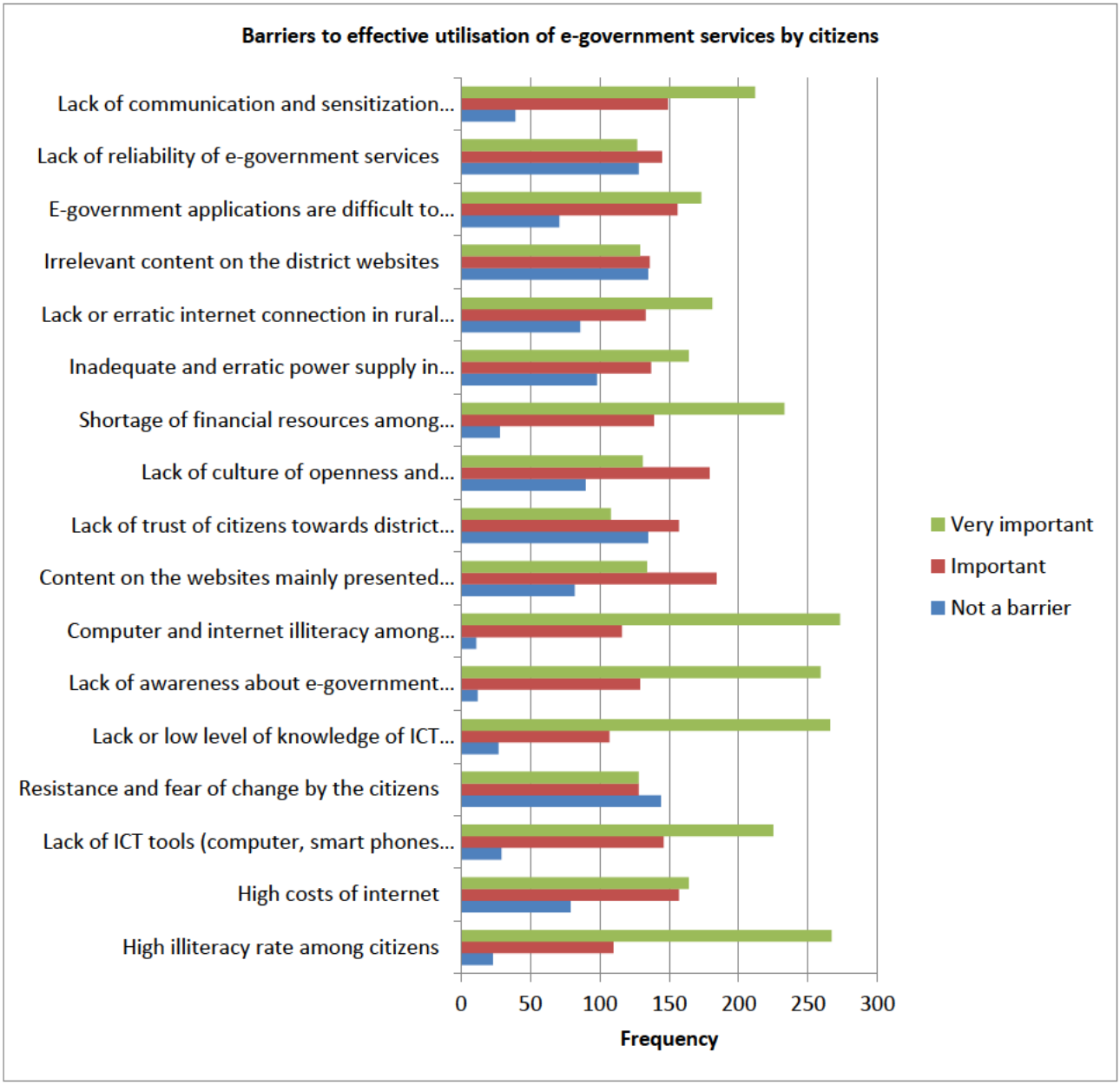
The results of Table 6.37 show the following major findings:

- High illiteracy rate among citizens was declared a very important barrier in Kamonyi and Kicukiro, more so than in Lejweleputswa and Fezile Dabi;
- High cost of the internet was declared a very important barrier in Kamonyi and Kicukiro, more so than in Fezile Dabi and Lejweleputswa;
- Lack of ICT tools such as computers, laptops, smartphones and tablets was declared a very important barrier in Kicukiro and Kamonyi, more so than in Lejweleputswa and Fezile Dabi;
- Lack of culture of openness and participation was considered a very important barrier in Kicukiro and Kamonyi, more so than in Lejweleputswa and Fezile Dabi; and
- Inadequate and erratic power supply in rural areas was declared a very important barrier in Kamonyi and Kicukiro, more so than in Lejweleputswa and Fezile Dabi.

The results of Table 6.37 on barriers to effective utilisation of e-government services by citizens are summarised in Graph 6.26.

Table 6.36: Barriers to effective utilisation of e-government services by the citizens

		South Africa				Rwanda					
		Lejweleputswa		Fezile Dabi		Kicukiro		Kamonyi			
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Total frequencies	Total percentages
High illiteracy rate among citizens	Not a barrier	4	4.0%	7	7.0%	9	9.0%	3	3.0%	23	5.8%
	Important	33	33.0%	26	26.0%	21	21.0%	30	30.0%	110	27.5%
	Very important	63	63.0%	67	67.0%	70	70.0%	67	67.0%	267	66.8%
High costs of internet	Not a barrier	31	31.0%	36	36.0%	9	9.0%	3	3.0%	79	19.8%
	Important	44	44.0%	35	35.0%	38	38.0%	40	40.0%	157	39.2%
	Very important	25	25.0%	29	29.0%	53	53.0%	57	57.0%	164	41.0%
Lack of ICT tools (computer, smart phones etc.) among citizens	Not a barrier	15	15.0%	7	7.0%	4	4.0%	3	3.0%	29	7.2%
	Important	48	48.0%	56	56.0%	17	17.0%	25	25.0%	146	36.5%
	Very important	37	37.0%	37	37.0%	79	79.0%	72	72.0%	225	56.2%
Resistance and fear of change by the citizens	Not a barrier	37	37.0%	35	35.0%	34	34.0%	38	38.0%	144	36.0%
	Important	29	29.0%	36	36.0%	31	31.0%	32	32.0%	128	32.0%
	Very important	34	34.0%	29	29.0%	35	35.0%	30	30.0%	128	32.0%
Lack or low level of knowledge of ICT among citizens	Not a barrier	6	6.0%	7	7.0%	14	14.0%	0	0.0%	27	6.8%
	Important	30	30.0%	39	39.0%	22	22.0%	16	16.0%	107	26.8%
	Very important	64	64.0%	54	54.0%	64	64.0%	84	84.0%	266	66.5%
Lack of awareness about e-government and the benefits of e-government	Not a barrier	5	5.0%	4	4.0%	3	3.0%	0	0.0%	12	3.0%
	Important	27	27.0%	29	29.0%	42	42.0%	31	31.0%	129	32.2%
	Very important	68	68.0%	67	67.0%	55	55.0%	69	69.0%	259	64.8%
Computer and internet illiteracy among citizens	Not a barrier	7	7.0%	4	4.0%	0	0.0%	0	0.0%	11	2.8%
	Important	36	36.0%	35	35.0%	22	22.0%	23	23.0%	116	29.0%
	Very important	57	57.0%	61	61.0%	78	78.0%	77	77.0%	273	68.2%
Content on the websites mainly presented in languages that citizens are	Not a barrier	14	14.0%	10	10.0%	29	29.0%	29	29.0%	82	20.5%
	Important	41	41.0%	52	52.0%	44	44.0%	47	47.0%	184	46.0%
	Very important	45	45.0%	38	38.0%	27	27.0%	24	24.0%	134	33.5%
Lack of trust of citizens towards district officials	Not a barrier	16	16.0%	10	10.0%	49	49.0%	60	60.0%	135	33.8%
	Important	59	59.0%	56	56.0%	19	19.0%	23	23.0%	157	39.2%
	Very important	25	25.0%	34	34.0%	32	32.0%	17	17.0%	108	27.0%
Lack of culture of openness and participation among citizens	Not a barrier	18	18.0%	15	15.0%	23	23.0%	34	34.0%	90	22.5%
	Important	51	51.0%	60	60.0%	36	36.0%	32	32.0%	179	44.8%
	Very important	31	31.0%	25	25.0%	41	41.0%	34	34.0%	131	32.8%
Shortage of financial resources among citizens	Not a barrier	4	4.0%	4	4.0%	15	15.0%	5	5.0%	28	7.0%
	Important	31	31.0%	47	47.0%	28	28.0%	33	33.0%	139	34.8%
	Very important	65	65.0%	49	49.0%	57	57.0%	62	62.0%	233	58.2%
Inadequate and erratic power supply in rural areas	Not a barrier	23	23.2%	43	43.0%	29	29.0%	3	3.0%	98	24.6%
	Important	48	48.5%	34	34.0%	38	38.0%	17	17.0%	137	34.3%
	Very important	28	28.3%	23	23.0%	33	33.0%	80	80.0%	164	41.1%
Lack or erratic internet connection in rural areas	Not a barrier	23	23.0%	43	43.0%	20	20.0%	0	0.0%	86	21.5%
	Important	48	48.0%	33	33.0%	31	31.0%	21	21.0%	133	33.2%
	Very important	29	29.0%	24	24.0%	49	49.0%	79	79.0%	181	45.2%
Irrelevant content on the district municipalities' websites	Not a barrier	17	17.0%	41	41.0%	32	32.0%	45	45.0%	135	33.8%
	Important	60	60.0%	36	36.0%	21	21.0%	19	19.0%	136	34.0%
	Very important	23	23.0%	23	23.0%	47	47.0%	36	36.0%	129	32.2%
E-government applications are difficult to use	Not a barrier	17	17.0%	21	21.0%	21	21.0%	12	12.0%	71	17.8%
	Important	61	61.0%	56	56.0%	29	29.0%	10	10.0%	156	39.0%
	Very important	22	22.0%	23	23.0%	50	50.0%	78	78.0%	173	43.2%
Lack of reliability of e-government services	Not a barrier	15	15.0%	12	12.0%	49	49.0%	52	52.0%	128	32.0%
	Important	58	58.0%	64	64.0%	8	8.0%	15	15.0%	145	36.2%
	Very important	27	27.0%	24	24.0%	43	43.0%	33	33.0%	127	31.8%
Lack of communication and sensitization by the district officials to the citizens about e-	Not a barrier	17	17.0%	7	7.0%	10	10.0%	5	5.0%	39	9.8%
	Important	58	58.0%	50	50.0%	23	23.0%	18	18.0%	149	37.2%
	Very important	25	25.0%	43	43.0%	67	67.0%	77	77.0%	212	53.0%



Graph 6.26: Barriers tor effective utilisation of e-government services by the citizens

The results of Graph 6.26 indicate the barriers which the respondents declared as very important, namely high illiteracy rate among citizens; computer and internet illiteracy among citizens; shortage of financial resources among citizens; lack of awareness about e-government and its benefits; and lack of communication and sensitisation by the district municipality's officials to citizens about e-government. Barriers which were not considered as barriers were: resistance and fear of change by citizens and lack of trust by citizens towards district municipality officials.

Though the results of Tables 6.36 and 6.37 and Graphs 6.25 and 6.26 show the barriers to effective utilisation of e-government by both the districts and the citizens, they do not indicate whether there are statistically significant differences between the selected district municipalities. Therefore in order to determine whether there were any differences between the districts in barriers to the utilisation of e-government for both the district municipalities and citizens, totals were calculated for the Likert scale tables. Scores were recoded so that higher scores were indicative of more barriers or limits. A MANOVA was run through three steps:

a. Testing the assumption of normality

In order to determine whether data were normally distributed within each district municipality, Normal Q-Q Plots were examined. The Normal Q-Q plots showed that there were some minor deviations from normality, although data were mostly approximately normally distributed.

b. MANOVA results

Table 6.37: Multivariate Tests on barriers to utilisation of e-government services

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.976	8009.873[b]	2.000	395.000	0.000	.976
	Wilks' Lambda	.024	8009.873[b]	2.000	395.000	0.000	.976
	Hotelling's Trace	40.556	8009.873[b]	2.000	395.000	0.000	.976
	Roy's Largest Root	40.556	8009.873[b]	2.000	395.000	0.000	.976
District	Pillai's Trace	.236	17.700	6.000	792.000	.000	.118
	Wilks' Lambda	.766	18.781[b]	6.000	790.000	.000	.125
	Hotelling's Trace	.302	19.864	6.000	788.000	.000	.131
	Roy's Largest Root	.292	38.514[c]	3.000	396.000	.000	.226

a. Design: Intercept + District

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

From the row highlighted in yellow, it can be seen that there was a statistically significant difference in mean scores between the districts on the combined dependent variable (barriers for district municipalities and citizens combined), F(6,

790) = 18.781, p < .0005; Wilks' Λ = 0.766. In order to determine which of the dependent variables contributed to the significant result, the tests of the between-subjects effects table (Table 6.39) are inspected.

Table 6.39: Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Total Limits/Barriers for District	2391.500[a]	3	797.167	6.188	.000	.045
	Total Limits/Barriers for Citizens	2103.900[b]	3	701.300	16.266	.000	.110
Intercept	Total Limits/Barriers for District	889249.000	1	889249.000	6902.388	.000	.946
	Total Limits/Barriers for Citizens	666182.440	1	666182.440	15451.183	0.000	.975
District	Total Limits/Barriers for District	2391.500	3	797.167	6.188	.000	.045
	Total Limits/Barriers for Citizens	2103.900	3	701.300	16.266	.000	.110
Error	Total Limits/Barriers for District	51017.500	396	128.832			
	Total Limits/Barriers for Citizens	17073.660	396	43.115			
Total	Total Limits/ Barriers for District	942658.000	400				
	Total Limits/ Barriers for Citizens	685360.000	400				
Corrected Total	Total Limits Barriers for District	53409.000	399				
	Total Limits/Barriers for Citizens	19177.560	399				

a. R Squared = .045 (Adjusted R Squared = .038)

b. R Squared = .110 (Adjusted R Squared = .103)

As can be seen from the rows highlighted in green, there was a statistically significant difference in mean scores for limits and barriers for the district municipalities (F(3,396)= 6.188, p < 0.005)), as well as for limits and barriers for the

citizens (F(3, 396)=16.266, p < 0.005)), between different district municipalities. To determine between which of the districts these differences lay, the multiple comparisons table (Table 6.40) is consulted.

Table 6.40: Multiple comparisons of barriers to the utilisation of e-government

Dependent Variable				Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Total_Limits_Barriers_District	Games-Howell		FezileDAbi	-0.71	1.17596	0.931	-3.7587	2.3387
		Lejweleputswa	Kicukiro	3.22	1.63168	0.202	-1 0119	7.4519
			Kamonyi	5.3300*	1.68981	0.01	0 9461	9.7139
		FezileDAbi	Lejweleputswa	0.71	1.17596	0.931	-2.3387	3.7587
			Kicukiro	3.93	1.51586	0.051	-0.008	7.868
			Kamonyi	6 0400*	1.57826	0.001	1 9385	10.1415
		Kicukiro	Lejweleputswa	-3.22	1.63168	0.202	-7.4519	1.0119
			FezileDAbi	-3.93	1.51586	0.051	-7.868	0.008
			Kamonyi	2.11	1.94175	0.698	-2 9212	7.1412
		Kamonyi	Lejweleputswa	-5.3300*	1.68981	0.01	-9.7139	-0.9461
			FezileDAbi	-6 0400*	1.57826	0.001	-10.1415	-1.9385
			Kicukiro	-2.11	1.94175	0.698	-7.1412	2.9212
Total_Limits_Barriers_Citizens	Games-Howell		FezileDAbi	0.39	0 9857	0.979	-2.164	2.944
		Lejweleputswa	Kicukiro	0.48	0.96579	0.96	-2 0225	2.9825
			Kamonyi	-4 9900*	0.90982	0	-7.3483	-2.6317
		FezileDAbi	Lejweleputswa	-0.39	0 9857	0.979	-2.944	2.164
			Kicukiro	0.09	0.94702	1	-2.3638	2.5438
			Kamonyi	-5.3800*	0.88987	0	-7.6863	-3.0737
		Kicukiro	Lejweleputswa	-0.48	0.96579	0.96	-2 9825	2.0225
			FezileDAbi	-0.09	0.94702	1	-2 5438	2.3638
			Kamonyi	-5.4700*	0.86776	0	-7.7187	-3.2213
		Kamonyi	Lejweleputswa	4 9900*	0.90982	0	2.6317	7.3483
			FezileDAbi	5.3800*	0.88987	0	3 0737	7.6863
			Kicukiro	5.4700*	0.86776	0	3 2213	7.7187

Based on observed means.

The error term is Mean Square(Error) = 43.115.

*. The mean difference is significant at the .05 level.

Barriers for the district municipalities

From the section highlighted in green in Table 6.40, it can be seen that there was a significant difference in barriers for the district municipalities; between Kamonyi and Lejweleputswa (p=0.010), as well as between Kamonyi and Fezile Dabi (p=0.001). From the descriptive statistics table (Table 6.41) it can be seen that for Kamonyi there were fewer perceived limits or barriers (mean = 43.780) than for both Lejweleputswa (mean = 49.110) and Fezile Dabi (mean = 49.820).

Table 6.41: Comparison of mean on barriers to utilisation of e-government by the district municipalities

Descriptive Statistics

Residence of respondent		Mean	Std. Deviation	N
Total Limits/ Barriers-District	Lejweleputswa	49.1100	9.34728	100
	Fezile Dabi	49.8200	7.13560	100
	Kicukiro	45.8900	13.37410	100
	Kamonyi	43.7800	14.07741	100
	Total	47.1500	11.56966	400

Barriers for the citizens

From the section highlighted in purple in Table 6.40, it can be seen that there were significant differences in perceived limits or barriers for the citizens between Kamonyi and Lejweleputswa (p=0.000), Kamonyi and FezileDabi (p=0.000) and Kamonyi and Kicukiro (p=0.000). From the descriptive table (Table 6.42) it can be seen that Kamonyi had higher perceived barriers to utilisation of online services by citizens (mean = 44.770) than Lejweleputswa (mean=39.780), Fezile Dabi (mean=39.390) and Kicukiro (mean = 39.300).

Table 6.42: Comparison of mean on constraints on utilisation of e-government services by citizens

Descriptive Statistics

Residence of respondent		Mean	Std. Deviation	N
Total Limits/Barriers-Citizens	Lejweleputswa	39.7800	7.09756	100
	Fezile Dabi	39.3900	6.84001	100
	Kicukiro	39.3000	6.54973	100
	Kamonyi	44.7700	5.69220	100
	Total	40.8100	6.93282	400

6.3 RESULTS OBTAINED FROM THE INTERVIEW SCHEDULE

According to Salking (200:195), interviews contain two general types of questions, namely structured (closed-ended) and unstructured (open-ended) questions. In this study, the semi-structured interview schedule was used to conduct interviews with the selected district municipality. The aim was to determine their level of awareness of the purpose, opportunities and requirements of e-government.

According to Rogers (2003:20), an individual is aware of an innovation if he or she can provide enough information on the questions What? Why? and How? about an innovation. Therefore, the questions used in the interview schedule were divided into two main sections as follows:

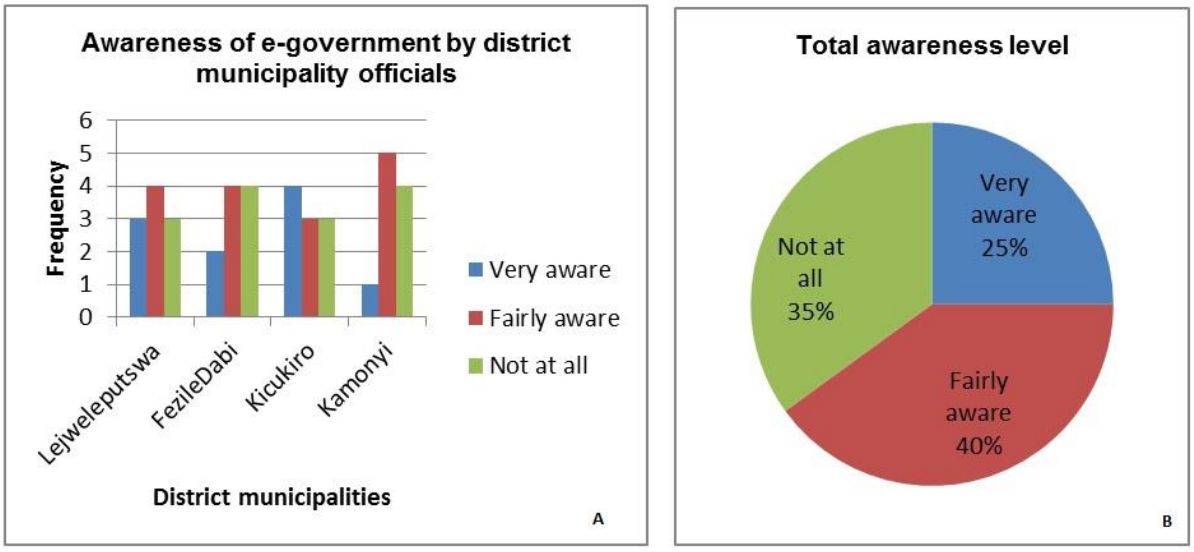
Section A: Awareness of e-government (What and Why-questions)

As is said "*you cannot give what you don't have*", district municipality officials must first be very aware of e-government, its purpose, advantages and requirements, before they sensitise and encourage citizens to utilise e-government services.

Section B: Computer and internet literacy (How-questions)

A certain level of knowledge and skills on how to manipulate a computer and to utilise the internet is required for local government officials. Lack or inadequate skills of municipality officials on how to use both the computer and the internet negatively affect the utilisation of e-government.

The question whether the interviewees (district municipality officials) are aware of e-government produced the following results:

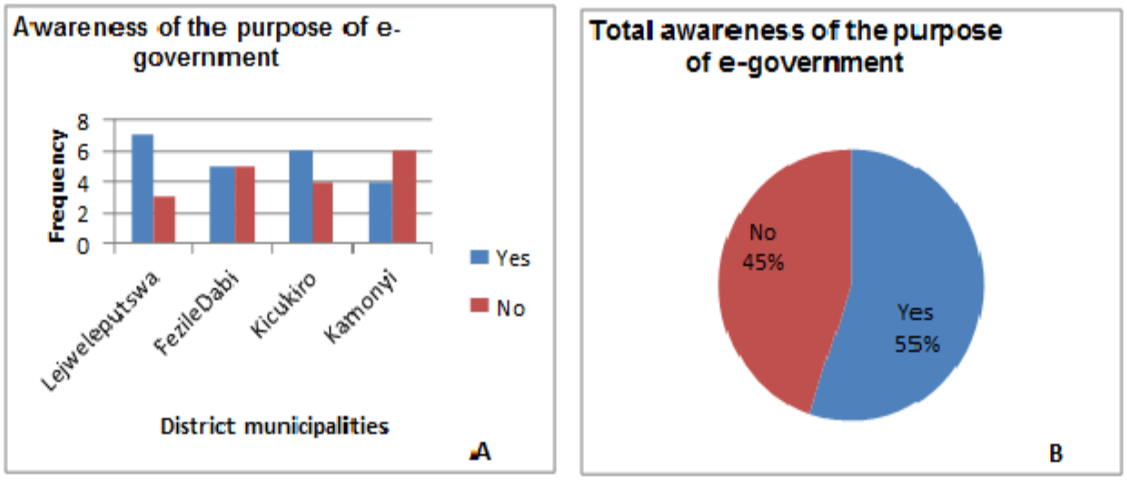


Graph 6.27: Awareness of e-government by interviewees (A- Awareness of e-government by interviewees per district municipalities; B- Total awareness of e-government by interviewees

Graph 6.27 shows that only 25 percent are very aware of e-government, 40 percent fairly aware, while 35 percent are not aware of e-government. Overall it can be concluded that awareness of e-government by district officials is a challenge and training in e-government is needed.

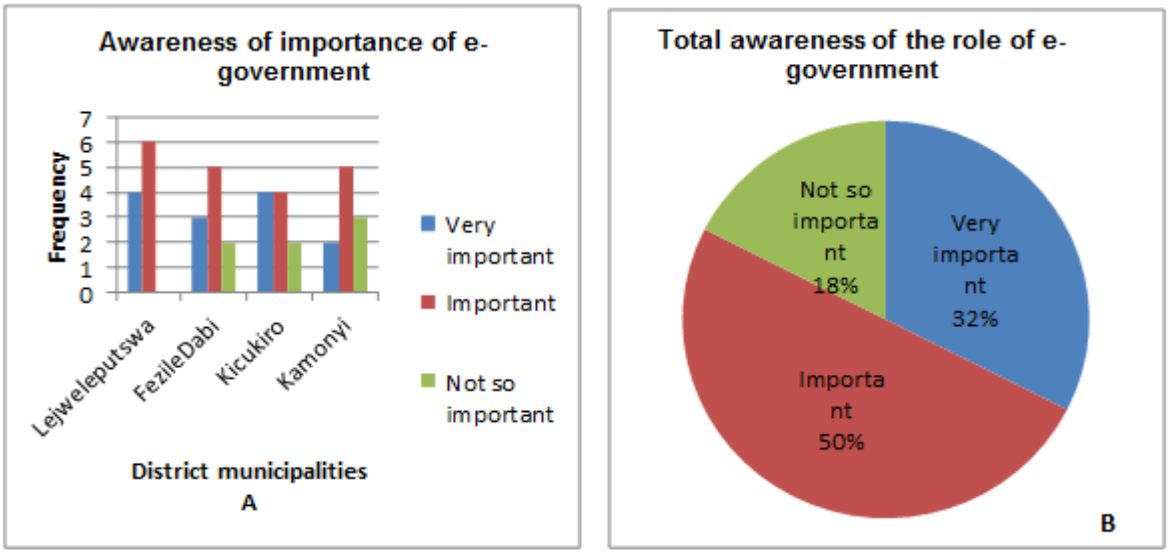
The question whether the interviewees know the reason (s) why their district municipalities decided to utilise e-government provided the following results:

The results of Graph 6.28 show that 55 percent admit that they know the reason why the district municipality introduced e-government whilst 45 percent acknowledge that they do not know the reason why e-government was implemented. Forty-five percent are not a negligible percentage and that is a big challenge if the fact is considered that these interviewees are the providers of e-government services. District municipality officials at all levels need to be informed about why e-government as the new system of public service delivery was introduced and implemented. During interviews in the field, one interviewee commented: "*We as employees we are not consulted and sometimes not informed. We sometimes see people (IT Technicians) coming and install systems or software and we are asked then, to utilise them. But, the principle or reason behind is not often explained to us*".



Graph 6.28: Awareness of the purpose of e-government by interviewees (A-Awareness of the purpose of e-government by interviewees per district municipalities; B-Total awareness of the purpose of e-government by interviewees).

The question whether interviewees are aware of the advantages or benefits of e-government produced the following results:

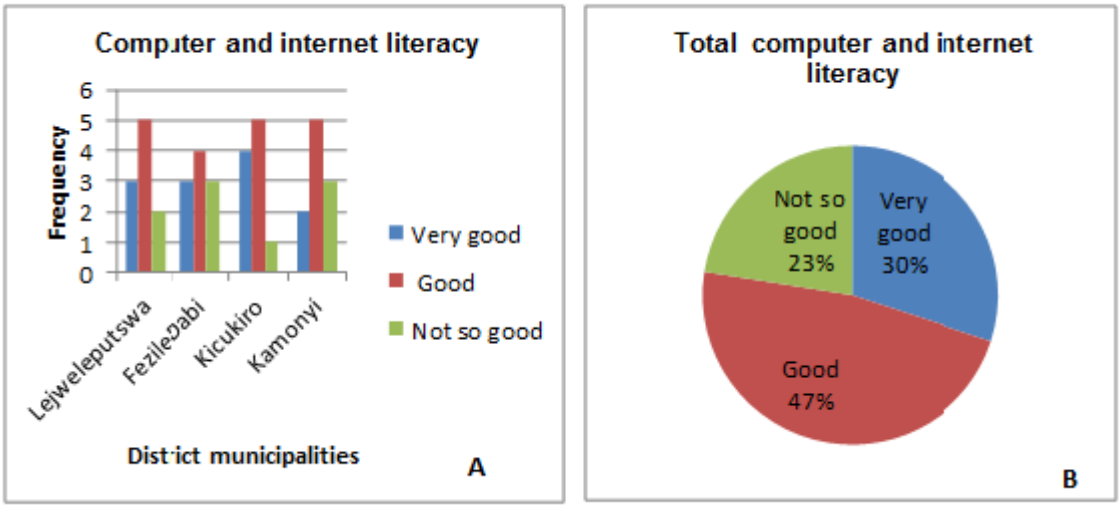


Graph 6.29: Awareness of the role of e-government by interviewees (A-Awareness of the role of e-government by interviewees per district municipalities; B-Total awareness of the role of e-government by interviewees).

The results of Graph 6.29 show that 32 percent of the interviewees declare that e-government is very important, 50 percent admit that e-government is important, while 18 percent affirm that e-government is not so important. Considering the fact that the

public officials are the providers of e-government services they should fully understand the role of e-government. However, the required level of understanding of the role of e-government is lacking. During interviews in the field, one interviewee commented: "*The fact that the district municipality does not have a clear ICT policies and e-government policy in particular, it is a clear indication that e-government is not taken as of high priority. Up until today, I didn't see people complaining that internet is not there or is slow etc. but people are complaining about water, houses, health facilities and roads etc. Therefore, because of pressing demands for services earlier mentioned and the limited budget, e-government is of a lower priority for most of local government*".

The question whether the interviewees have the necessary computer and internet skills produced the following results:



Graph 6.30: Computer and internet skills of interviewees (A-Computer and internet skills of interviewees per district municipalities; B-Total computer and internet skills of interviewees)

The results of Graph 6.30 show that only 30 percent of interviewees were very good at manipulating the computer and the internet, 47 percent declared to be good, while 23 percent were not so good in utilising the computer and the internet. From these figures, it can be concluded that there is a need for computer and internet training in order to ensure the smooth provision of online services. During interviews in the field one interviewee who was in charge of ICT in the district said: "*The level of computer and internet skills of district officials is a matter of concern here. I am always called in*

their offices to intervene or to fix small things that any person who attended the university should be capable of. And, I am only one in the district - Imagine! In addition, because the budget allocated for ICT and e-government in particular, is not enough I can't propose and organize ICT training sessions for employees. It is very difficult"

6.4 SUMMARY

The study targeted 400 respondents who were adult citizens above 18 years of age. They were selected randomly from four district municipalities with 100 respondents from each. All 400 questionnaires were fully completed and returned. Fifty-three percent of respondents were females and this figure reflects the general population characteristics of both Rwanda and South Africa. Sixty-nine percent of respondents were young (aged 18-39 years) and that also reflects the national distribution of population per age in both countries. It is argued that young people tend to embrace ICT more than old people. Therefore, both South Africa and Rwanda can count on their well-educated young population for future socio-economic development through ICT innovations.

According to the empirical findings, the educational level of respondents was generally low, whereby 7.5 percent were not formally educated and more than 74 percent had primary and high school certificates. As indicated in the literature, the educational level influences the utilisation of e-government services, whereby people with a low level of education find e-government services difficult to use or not useful at all. Per capita income also influences the utilisation of e-government services. The empirical findings showed that more than 70 percent of respondents were earning either less than R1 000 or between R1 000 and R3 000 monthly. With this monthly earning or income, it was argued that respondents in this category cannot cover all expenses (housing, food, transport, etc.) and reserve some money for the internet. In such a situation, the use of the internet becomes a luxury.

The utilisation of e-government services requires one to have access to a computer and the internet, but also to have minimum skills to manipulate them. In addition, one must know the most commonly used internet languages. However, the research findings showed that 50 percent did not have access to the computer (either at

home, cybercafé or elsewhere) and only 27 percent had access to the computer. About 70 percent did not know how to manipulate a computer. Only 20 percent were excellent at using the internet and more than 60 percent did not even know what the internet is. Fifty percent did not know English and 68 percent did not know French. Bearing in mind these figures, it is unlikely that e-government services would have been effectively requested and utilised.

According to the research findings, the level of awareness by respondents of the district municipality websites was of critical concern. Seventy-three percent were not informed at all or were not so aware. Only 26 percent were well aware or aware of the existence of the district websites. However, among the 26 percent who declared to be aware of the district website, 75 percent were not aware of online information or services which can be obtained from the district municipality website. A significant percentage (above 75%) declared not receiving any awareness campaign information about e-government, the benefits of e-government, available online services and on how to access them.

In order to establish whether there is any difference in the awareness level between the four district municipalities, the Kruskall-Wallis H test was done. The test revealed a statistically significant difference in the level of awareness between district municipalities. Lejweleputswa scored a higher level on awareness than other district municipalities.

The level of request and utilisation of e-government services by respondents was also of great concern. The empirical findings showed that 71 percent never requested or utilised online services provided through the district municipality website. The Kruskall-Wallis H test revealed a statistically significant difference between district municipalities. Lejweleputswa had a higher number of respondents who requested and utilised e-government services, followed by Kicukiro, Kamonyi and lastly Fezile Dabi. In addition, it was shown that the level of request and utilisation of online services was influenced by such factors as the level of education, level of income, level of computer and internet literacy, level of English and French literacy, availability of ICT tools or devices, perceived quality of available online information and services, additional access facilities and perceived online customer care.

Concerning the availability of online services on the district municipality websites, a significant percentage of respondents (above 50 percent) could not appreciate it as they had never visited the district municipality websites. However, those few respondents who visited the website admitted that some government information such as policies, laws, council deliberations can be obtained from the websites. Some contact details of district municipality officials can also be obtained as well as advertisements for jobs and tenders. However, the respondents declared that some information was irrelevant and outdated. In addition, they admitted that some government forms were available and were downloadable, but could not be uploaded. Online transactions (online payment) and online consultation (sharing views, giving comments on policies) were practically not possible, especially in Rwanda.

As a result of the low level of awareness, limited quantity and quality of available online information and services, and the low level of request and utilisation of available e-government services by respondents, the impact of e-government was not yet highly appreciated. It was still perceived as minor. However, small degrees of impacts were observed as 53 percent of respondents agreed that the utilisation of ICT has minimised bureaucracy and paperwork and therefore long queues waiting for government information and services have been reduced.

Barriers to the effective utilisation of e-government were investigated. The empirical findings revealed that barriers, such as the low-level computer and internet literacy among local government officials, a culture of corruption and favouritism and shortage of financial resources were declared very important constraints on the effective utilisation of e-government by the district municipality. Barriers such as computer and internet illiteracy, low level of income, high illiteracy rate, lack of modern ICT devices were revealed as very important barriers to the utilisation of e-government services by the citizens. The Kruskall-Wallis H test revealed that Kamonyi had higher constraints than other district municipalities.

Finally, the level of awareness of e-government among the district municipality officials was investigated. The findings from interviews showed that awareness of e-government and computer and internet skills are also a matter of concern for district municipality officials.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

Government exists primarily to serve the citizens and make their lives better. Ensuring that available resources are adequately used for the good of the citizens and enhancing the quality of service delivery were among others the major objectives of the new governments of South Africa and Rwanda when they came in to power in 1994. In this endeavour of making lives better, local governments have to play a critical role. As the spheres of government which are closest to the community, local governments are considered a channel through which central government ensures the satisfactory provision of services to citizens. However, because of a lack of services or poor service delivery, strikes and community protests are among others indications that local spheres of government are not performing well in delivering public information and services to citizens.

In today's era of the knowledge economy and information society, the needs and expectations of citizens are changing and are increasing year-on-year. Citizens are demanding more participation, more open, transparent, accountable and efficient government and, most importantly, better service delivery. There are also increasing expectations of easier access to more public information and services from anywhere and at anytime (24/7 days).

To address the increasing needs and expectations of the citizens of today's era, a local government does not only need to be developmental, but also modernised through the utilisation of new ICTs. The effective utilisation of new ICTs by local governments in developed countries, for instance France, revealed that ICT is an enabler tool to streamline local government administration, to promote citizen participation, to enhance efficiency, transparency and accountability in local government, and most importantly, to enhance service delivery to citizens.

As stated in earlier chapters, the research's main hypothesis was that ICT and e-government in particular, are underutilised by local spheres of government in both Rwanda and South Africa, which in turn negatively affects public services delivery. The main objective of the research was to conduct a comparative study on the

utilisation of e-government by the two district municipalities of Fezile Dabi and Lejweleputswa in South Africa and the two district municipalities of Kicukiro and Kamonyi in Rwanda. In addition, a model for effective online service delivery at the local sphere of government was to be developed from the empirical findings.

Emerging from the main objective, the research sought to attain co-objectives to:

- Determine through extensive literature searches (journal articles and legislative frameworks) the purpose and role of local spheres of government in Rwanda and South Africa and the role of e-government as an effective enabling tool to streamline public administration activities and better service delivery to citizens;
- Ascertain the level of awareness of district municipality officials of the purpose, opportunities and requirements of e-government;
- Ascertain the level of awareness of the customers (citizens) of e-government services in South Africa and Rwanda;
- Determine the type of online services offered by each of the selected district municipalities in Rwanda and South Africa;
- Determine the level of request and utilisation of online services by the customers of each of the selected district municipalities in Rwanda and South Africa;
- Determine the factors influencing the utilisation of online services by the customers;
- Determine the contribution of e-government to improving public service delivery in the selected district municipalities in Rwanda and South Africa;
- Determine the constraints on the use of e-government at the local spheres of government in Rwanda and South Africa; and
- Develop a model for effective and efficient online service delivery at the local sphere of government.

The study was articulated along 7 chapters. Chapter 1 introduced the study by presenting the background to the study, the problem statement, underlining research objectives, research methodology, ethical considerations, limitations of the study and clarifying key concepts used in the study. Chapter 2, which focused on literature review, presented an extensive review of literature related to ICT and e-government

in particular. It outlined the status of e-government in Africa compared with other regions of the world. It highlighted the challenges faced by countries in Africa in implementing e-government and the conditions for effective utilisation of e-government by governments in Africa. Chapter 3 provided an overview of ICT and e-government development in both South Africa and Rwanda. The main aspects discussed in this chapter included the motivations for e-government development, the achievements made so far in the domain of ICT and e-government and the challenges faced. Also, a comparative analysis between Rwanda and South Africa was done based on e-government development indices provided by ITU and UN. Chapter 4 presented and discussed a theoretical model for better understanding the factors influencing the adoption, diffusion and utilisation of an innovation such as e-government. It offered insights into the better understanding of factors which can positively or negatively influence the use of e-government services by citizens. Chapter 5 presented in details the research methodology used for the study. Research paradigm, research approach, sampling methods, data collection techniques and data analysis methods, reliability and validity were all discussed in this chapter. Chapter 6 presented the empirical findings. The empirical findings were presented and discussed and the purpose was to answer the research questions and to attain the research objectives. Chapter 7 concluded the study. The aspects discussed included the conclusions drawn from the literature review and the empirical study, recommendations and the implications and suggestions for further research.

7.2. CONCLUSIONS BASED ON THE LITERATURE REVIEW

The literature study leads to important conclusions. Modern governments are working in an environment characterised by a high complexity of citizens' needs and expectations and other multi-faceted challenges ahead, but many opportunities are also offered by the rapid advancements in technological innovations. The demands for quantity and quality of public services are increasing, as well as the demands for easier access to public information and services from anywhere and at anytime (24/7days). Today, government in general and local spheres of government in particular, are under pressure to address the changing and increasing needs and expectations of citizens. Therefore, the focus should not only be on the kinds of services to be provided, but also on how their provision can be improved.

It is largely clear from the literature that the utilisation of new ICTs by the public sector has transformed the traditional ways of public service delivery and helped to solve the problems of a public administration that was too big, inefficient and expensive and therefore unable to serve citizens as it was supposed to. E-government was seen as an enabler tool to enhance the quality of service delivery. This view was shared by different authors. According to UN (2014:32), e-government is increasingly seen as an enabler tool to reduce costs while providing better services to citizens and businesses. Heeks (2002:66) maintains that through e-government, public administrations around the world can be more efficient, provide better services and respond to demands for transparency and accountability. Furthermore, Kroukamp (2005:60) argues that the use of new ICT in the public sector helps to reduce administrative procedures and bureaucracy. It enables the government to increase transparency, and thus decrease the possibility of maladministration and corruption.

Though the opportunities offered by ICT are enormous, countries in Africa failed and are still failing to seize those opportunities. Countries in Africa still face many challenges in catching up with the rest of the world in terms of the utilisation of e-government due to many socio-economic and political factors. For instance, while almost 40 percent of the world's population was using the internet by the end of 2013, only 16 percent of people were using the internet in Africa (UN, 2014:96). The E-Government Development Index (EGDI) average in Africa is 0.2661 below the world average of 0.4712, placing Africa the last among other continents. Based on this state of affairs it was recommended that multi-level changes, namely technological, political, socio-cultural, economic, and legal and regulatory changes are critical for countries in Africa to be able to seize the opportunities offered by new ICTs.

7.2.1 Digital divide

The digital divide refers to the ability to have access to new ICTs, especially the internet and the capability to use it. The digital divide arises from broad socio-economic inequality and at the root of both are economic and social disparities between countries, communities within the country and between individuals. The

digital divide is correlated with demographic and socio-economic characteristics such as income, gender, level of education and age.

The digital divide is observed in one form or another in developing countries, including Rwanda and South Africa. For instance, it was observed that in South Africa as well as in Rwanda ICT infrastructure is more concentrated in urban areas while it is lacking in rural areas. This obviously creates a digital divide between urban and rural areas. According to De Beer and Mokhele (2004), South Africa is ranked the 3rd country in the world where the gap between the rich and the poor is large. This in turn creates a digital divide among the members of communities. As the disparities in terms of income, quality of education of individuals and members of different ethnic groups increase, the digital divide follows that path and increases as well. The digital divide increases as the gap between the rich and the poor increases.

In the era of knowledge economy and information society, the digital divide will have disastrous consequences and will make the poor in rural areas more and more vulnerable and disadvantaged. In this regard, Dzidonu (2011:21) argues that as more government information and services are moved online, there is an increasing concern that a significant portion of the population, especially the poor and rural population, will be shut off from government information and services and, therefore, shut off from jobs, tenders, health care, education and other government services. With increasing online opportunities for employment, tenders, jobs, bursaries, etc. large poor populations and populations in rural areas will be deprived of these opportunities because of the lack of basic access to technology and basic skills to use the technologies. It is recommended therefore that the government of South Africa and the government of Rwanda should make multi-level changes and reforms to minimise the digital divide.

7.2.2 Rate of failure of e-government projects in Africa, causes and consequences

According to Heeks (2003:2), the estimates of e-government failures in developing countries, including Rwanda and South Africa, are as follows: 35 percent of e-government initiatives were estimated total failures. It means that 35 percent of initiated e-government projects were never implemented or were implemented but

immediately abandoned. Fifty percent of e-government initiatives were estimated partial failures. It means that 50 percent of the major goals for the initiated e-government projects were not achieved and/ or there were significant undesirable outcomes. Fifteen percent of initiated e-government projects were estimated successful. It means that only 15 percent of initiated e-government projects attained their major and expected goals and did not experience undesirable outcomes. The causes of this rate of failures are many and complex.

According to Okemwa and Majanja (2009:20), the success or failure of an e-government project depends, among others, on the size of the gap that exists between current realities and the design of the e-government project. The larger this design-reality gap, the greater the risk of e-government failure. In Africa the failure is caused by the large gaps that exist between project design and African public sector realities. The gaps arise specifically because e-government concepts and designs have their origins in the West, origins that are significantly different from African realities.

The failure can also result from private-public gaps. According to Heeks (2003:5), there is a difference between the public sector and the private sector. However, some government officials forget this reality. They make the mistake by taking an information system designed for the private sector and then trying to transfer or install it into a very different public sector reality. This ignorance of the difference between the private and the public sector creates large design-reality gap which ultimately leads to failure. Illustrated by the above, it is recommended that the best e-government practices from Western developed countries or from the private sector can be implemented only if they are appropriate and adapted to South African as well as Rwandan public sector realities.

The failure of e-government can also result from other factors, such as lack of commitment or vision for e-government by top political leadership, insufficient budget for the country, donor funding dependence, low income of citizens, high rate of illiteracy, lack of ICT infrastructure, lack or inadequate electricity supply, lack of skilled human capital, lack or incapacity of government bodies in charge of implementation and coordination, and inadequate policies and regulatory frameworks.

The costs in connection with these failures are high and negatively affect the development of the country and the lives of citizens, because a huge amount of money is lost which should have been invested in projects that benefit citizens. Also, citizens may lose confidence and trust in the government, authorities and organisations involved in failure. It is recommended therefore that when they are proposing and implementing e-government projects, the governments of South Africa and Rwanda should make sure that they are responding to the citizens' expectations who expect a government that works better, costs less and spends less. Adapting the software and other e-government systems to the specific local realities is critical.

7.2.3 Conditions for effective implementation of e-government

According to the literature review, the successful implementation of e-government depends on certain conditions, such as:

- Full involvement and commitment of top-level political and economic leadership. The involvement of the top leadership of the country and other key stakeholders affects the success of e-government.
- Commitment of senior administrative, managerial and technical personnel within government agencies in charge of implementation and coordination of e-government. In this context, the role of (SITA) in South Africa and the role of (RDB-IT) in Rwanda are critical for the success of e-government. Therefore, thorough selection and recruitment of managers and employees for the two government bodies are recommended.
- Availability of critical technical expertise corps. E-government development requires critical technical skills and expertise. Therefore, it is recommended that the governments should support and invest more money in institutions of higher- learning, especially those with science and engineering programmes.
- An information literate citizenry. E-government is unlikely to be fully implemented in a country where people are illiterate. Investing and promoting quality education for all is critical.
- ICT infrastructure. Adequate ICT infrastructure, especially internet connection is critical. Access to electricity and to the internet with high-speed connection is recommended not only in urban but also in rural areas. Solar and wind

generated electricity should be encouraged, especially in rural areas to supplement other sources of electricity, such as hydro-power electricity.

7.2.4 E-government development in South Africa and in Rwanda

The Republic of South Africa was the leader in terms of e-government development in Africa for a very long time. However, it lost this place and has occupied the third place after Mauritius and Seychelles since 2012. According to the World e-government development ranking, South Africa has gradually lost its place since 2005 when it was at 58th position in 2005, at 61st position in 2008, at 97th position in 2010, at 101st position in 2012 and at 93rd position in 2014. This shows that efforts and focus put on ICT and e-government development in particular have decreased since 2005. However, the number of internet users has gradually increased in South Africa from 2.400.000 in 2000 to 26.841.126 in 2015. The internet penetration is now at 49 percent. This indicates that 51 percent of the total population of South Africa are not internet users and therefore cannot utilise e-government services. This is still a big challenge for the government of South Africa.

Rwanda is not among the top ten e-government development champions in Africa. However, it has shown positive progress in the last 15 years. According to the World e-government development ranking, Rwanda was ranked at 143rd position in 2005, at 141st position in 2008, at 148th position in 2010, at 140th position in 2012 and at 125th position in 2014. The number of internet users has dramatically increased from only 5000 in 2000 to 3.216.080 in 2015. The internet penetration is now at 25.4 percent. This indicates that a majority of about 74 percent are not internet users and cannot utilise e-government services. From the above figures it is clear that the journey is still long and much more needs to be done.

As indicated in Chapter 4, access to the internet, which is a precondition for the utilisation of e-government services, depends largely on three things: availability of ICT infrastructure, level of income and educational level of citizens. It is recommended that both governments of South Africa and Rwanda should focus on and invest in ICT infrastructure, electricity (especially in Rwanda), and quality education for all and most importantly on poverty alleviation through job creation.

7.3 CONCLUSIONS BASED ON THE EMPIRICAL FINDINGS

In this section, the results of the survey and semi-structured interviews conducted in order to answer the research questions and to achieve the research objectives are presented. All the nine co-objectives that emanated from the main research objective were achieved as follows:

7.3.1 Objective 1: To determine through extensive literature searches (journal articles and legislative frameworks), the purpose and role of local spheres of government in Rwanda and South Africa and the role of e-government as an effective enabling tool to streamline public administration activities and better service delivery to citizens

In Chapter 2 of the study an extensive review of literature on e-government and other related literature was conducted. To investigate the role of e-government, a literature review was conducted and involved the use of secondary sources such as journal articles, books, conference papers, theses and internet sources. The literature review also involved primary sources such as government reports and legislative frameworks. In Chapter 3 of the study, the role of the local sphere of government was investigated through the literature review that involved the use of primary sources such as government reports and legislative frameworks. The secondary sources such as books, journal articles, theses and internet sources were also used.

7.3.2 Objective 2: To determine the level of awareness of the district municipality officials about the purpose, opportunities and requirements of e-government

The findings from interviews shown in Graphs 6.27, 6.28, 6.29 and 6.30 illustrate that only 25 percent of officials interviewed were aware of e-government, 55 percent were aware of the purpose of e-government, only 32 percent considered e-government as very important and only 30 percent were very good in manipulating a computer and using the internet for online service delivery purposes. It is concluded from the figures that awareness of e-government is not only a matter of concern for the customers (citizens) of e-government services, but also for the providers (district municipality officials). The officials at local spheres of government need training to be

able to better understand e-government, the purpose of and benefits derived from its implementation. In addition, computer and internet skills for district municipality officials need to be upgraded.

7.3.3 Objective 3: To determine the level of awareness of the customers of e-government services in South Africa and Rwanda

The findings shown in Table 6.13 and Graph 6.12 in Chapter 6 illustrate that the majority of respondents (73 percent) were not aware of the district municipality website, 65 percent were not aware of the benefits of using e-government services, 67 percent were not aware of the purpose of e-government and 75 percent were not aware of online information and services available on the district municipality website. In addition, Table 6.14 and Graph 6.13 indicate that 77 percent have not received an awareness programme or campaign about e-government. The source of information for those few who were informed was personal search (39 percent) and friends (21 percent). The well-known and more appropriate awareness channels such as meetings with district officials, workshops, newspapers, radio and television programmes were not mentioned by the respondents. Furthermore, the Kruskall-Wallis H test revealed a significant difference between selected district municipalities, where Lejweleputswa had a higher level of awareness compared to other district municipalities. From the findings on the level of awareness of citizens it is concluded that the level of awareness of e-government is very low and that affects the utilisation of e-government services.

7.3.4 Objective 4: To determine the type of online services offered by each of the selected district municipalities in Rwanda and South Africa

The findings in Table 6.30 and Graph 6.23 in Chapter 6 show that a majority of about 40 percent did not know what can be done and obtained from the district municipalities' websites. This emphasises again the challenge of lack of awareness. 55 percent agreed that their district has a website. 32 percent agreed that contact details of some district municipality officials are found on the websites. The researcher agreed with them, because by browsing the websites of the selected district municipalities it was found that the contact details of only senior district officials are posted. It is recommended that the contact details of all employees should be posted. 31 percent agreed that policies and regulations are available

online. 37 percent agreed that tender announcements are posted, while 41 percent agreed that job vacancies announcements are available online. The researcher agreed with them, because by browsing the websites of the selected district municipalities it was found that job and tender announcements are posted, but some were out of date. In addition, 31 percent agreed that official forms can be found and downloaded. The researcher agreed with them, but only a few forms were available and were downloadable. 51 percent disagreed that citizens can share views and give comments on policies or programmes of the municipality *via* the district municipalities' websites. 51 percent disagreed that citizens can lodge complaints against misconduct of officials and corrupt practices via the district municipalities' websites. 31 percent disagreed that citizens can upload the completed forms when demanding online service via the district municipalities' websites. 33 percent disagreed that citizens can do online transactions such as online payment via district municipalities' websites. The researcher agreed with the respondents, because by browsing the websites of the selected district municipalities it was found that all kinds of online interactions and transactions were almost impossible. From the findings on available online services it is concluded that online services provided *via* the district municipalities' websites were at 95 percent informational (stage 1 of e-government maturity) rather than interactive and transactional. It is recommended therefore that the district municipalities should invest more money and make more effort so that full online services of stages 2, 3 and 4 are available for utilisation by citizens and businesses.

7.3.5 Objective 5: To determine the level of request and utilisation of online services by the customers of each of the selected district municipalities in Rwanda and South Africa

The findings in Table 6.15 and Graph 6.14 in Chapter 6 show that 71 percent have never requested and utilised online information and services provided by the district municipality website. Only 5 percent admitted that they have requested and utilised online information and services. A Kruskall-Wallis H test revealed that there were statistically significant differences between district municipalities. Lejweleputswa was found to have a higher number of people who requested and utilised online services from its website. It is followed by Kicukiro, Kamonyi and lastly by Fezile Dabi.

From the findings it is clear that the level of utilisation of online services by citizens is very low. It is recommended that the district municipalities should conduct a survey to establish the reason why citizens are not motivated to utilise the online information and services offered to them. However, the findings of Objective 6 can assist district municipalities to identify those factors and therefore make improvements in order to raise the level of request and utilisation of e-government services.

7.3.6 Objective 6: To determine the factors influencing the utilisation of online government information and services by customers

Different factors might negatively have influenced the level of request and utilisation of online services.

7.3.6.1 Availability of ICT tools or devices

The findings in Table 6.16 and Graph 6.15 indicate that a majority of about 75 percent declared not having a computer (desktop or laptop) either at home or at the workplace. Sixty percent declared not having access to a computer with high-speed internet connection when they visit or go to a cybercafé or to MPCCs. Overall, 40 percent declared that the internet connection is often disconnected and slow. In addition, Graph 6.16 shows that the majority of respondents declared that the purchasing costs of smartphones, tablets and laptops are very high and therefore not affordable. It can be concluded from the findings that the availability of ICT tools and devices for citizens are a challenge and that fact influenced negatively the level of request and utilisation of online services. Furthermore, a one-way ANOVA test revealed no significant differences between district municipalities. This challenge of lack of modern ICT tools or devices for citizens was common.

7.3.6.2 Perceived usefulness of online services

The findings in Table 6.18 and Graph 6.17 in Chapter 6 show that a majority of about 60 percent had positive perceptions about e-government. They appreciated what e-government can do if well implemented. Therefore, it can be concluded that perceived usefulness of e-government was not the cause of the low level of request and utilisation of e-government services. A one-way ANOVA revealed no significant differences between district municipalities.

7.3.6.3 User-friendliness, quality of online services and online customer care

- ***Perceived user-friendliness***

The findings in Graph 6.18 in Chapter 6 indicate that a large number of respondents could not appreciate the user-friendliness of the websites, because they had not visited the websites. However, another significant percentage had a negative perception of the user-friendliness of the district municipalities' websites, judging them as difficult to use. But the researcher argued that this negative perception by the respondents was not due to the fact that the district websites are difficult to use, but because of limited skills. When someone has limited skills in using something, he or she will always perceive it as difficult to use. It can be concluded therefore that, because of limited skills, citizens perceive the district websites as difficult to learn and use and that affected the level of request and utilisation of online services. It is recommended to increase the awareness programmes on how to use the district municipalities' websites. A MANOVA test revealed no statistically significant differences between district municipalities.

- ***Perceived quality of online services***

The findings in Graph 6.19 in Chapter 6 indicate that a significant percentage of respondents had a negative perception of the quality of online services provided *via* the district municipalities' websites. They declared that they find them irrelevant and that they are often out-dated. This might be one of the major causes of the low level of utilisation of online services provided by district websites. It is recommended therefore that district municipalities should consult citizens and other stakeholders to establish what kind of online information and services they require. Furthermore, a MANOVA test revealed significant differences between district municipalities. Kicukiro had a higher perceived quality of online services, while Lejweleputswa had a lower perceived quality of online services.

- ***Online customer care***

The findings in Graph 6.20 indicate that a significant percentage of respondents were concerned about online customer care. They declared that e-mails are not answered and no feedback is given when they communicate with officials online. It is concluded therefore that negative perceptions of online customer care might have limited the respondents to request and utilise online services. It is recommended that

district municipalities should put measures in place to enhance online customer care to citizens. The MANOVA test revealed some statistically significant differences between district municipalities, whereby Fezile Dabi and Kamonyi district municipalities had higher online customer care than other district municipalities.

7.3.6.4 Additional access facilities

The findings in Graph 6.22 in Chapter 6 show that a significant percentage of respondents were concerned about additional access facilities provided by the district municipalities' websites. For instance, they declared that the content on the websites is predominantly presented in English and French (in the case of Rwanda) and no translation mechanisms are put in place. Other content is only in local or mother tongue, therefore making access difficult for people from other communities. It is concluded that the lack of additional access facilities such as multi-lingual options might have limited the level of request and utilisation of online services. It is recommended that district municipalities' websites should provide multi-lingual options that will allow everyone easy access and easy use. A one-way ANOVA revealed statistically significant differences between district municipalities, whereby Fezile Dabi had lower additional access facilities than both Kicukiro and Kamonyi.

As far as factors that might have influenced the low level of utilisation of e-government services were concerned, Table 6.8 and Graph 6.5 show that the literacy level of respondents in both English and French was low. Overall, 60 percent knew neither English nor French. The level of education was also a concern whereby 75 percent have completed primary or secondary school (see Graph 6.2). Again, Graph 6.3 in Chapter 6 shows that a significant number (63%) of respondents were either self-employed or unemployed. Graph 6.4 shows that a majority of about 70 percent were earning less than R1 000 and between R1 000 and R3 000. It is therefore concluded that unemployment and disguised employment are the cause of the low level of income and that might negatively have influenced the level of request and utilisation of online services by the respondents.

7.3.7 Objective 7: To determine the contribution of e-government to improving public service delivery in the selected district municipalities in Rwanda and South Africa

The findings in Table 6.34 and Graph 6.23 in Chapter 6 show that 58 percent declared that the long queues waiting for public information and services (for instance to complete official forms) have been reduced. 61 percent declared that access to government information has become easier and 53 percent declared that bureaucracy and paperwork have minimised. However, 51 percent disagreed that the misuse of public money has been reduced. 46 percent disagreed that favouritism and corruption in service delivery have been reduced. 49 percent disagreed that district municipality officials are more transparent and accountable. It can be concluded from the findings that the contribution of e-government to improving public service delivery is still minimal and not yet visible. This is because the quantity and quality of online services provided to citizens and businesses by district municipalities' websites are still limited and again the level of utilisation of available online services is very low. Furthermore, it was observed that the contribution of the internet is less appreciated while the contribution of mobile phones in facilitating communication is emphasised by the respondents. It is recommended therefore that awareness about the utilisation of the internet should be increased as well as awareness campaigns on the benefits of the utilisation of available online services. A one-way ANOVA revealed no statistically significant difference between district municipalities.

7.3.8 Objective 8: To determine the constraints on the use of e-government at the local spheres of government in Rwanda and South Africa

-The constraints for the district municipalities

The findings in Table 6.36 and Graph 6.24 in Chapter 6 show that the important barriers to the implementation of e-government by district municipalities are: low computer literacy among district municipality officials, high illiteracy rate of citizens, lack or insufficient number of IT specialists because of high turnover of IT specialists who resign from local government to either central government institutions or to the private sector. Lack or inadequate ICT infrastructure and insufficient funds were also declared as important constraints. A MANOVA test revealed significant differences

between district municipalities, whereby Kamonyi had fewer barriers than both Lejweleputswa and Fezile Dabi.

-The constraints for the citizens

Table 6.37 and Graph 6.25 in Chapter 6 show that the important barriers to the utilisation of e-government services are: high illiteracy rate, lack of modern ICT devices, computer and internet illiteracy, shortage of financial resources and high cost of the internet. A one-way ANOVA revealed significant differences between district municipalities, whereby Kamonyi had higher constraints for its citizens to utilise online services than Lejweleputswa, Fezile Dabi and Kicukiro.

From the findings it can be concluded that the main constraints for both district municipalities and citizens were related to two issues, namely education and income (money). It is recommended therefore that government should empower both district municipality officials and citizens through access to quality education for citizens and regular training sessions for local government officials. Financial empowerment should be done through job creation for citizens and also by instigating the culture of entrepreneurship so that people can create jobs for themselves instead of expecting everything from government. District municipalities should be supported to maximise local tax collection.

7.3.9 Objective 9: To develop a model for effective and efficient online service delivery at the local sphere of government

The main objective of the study was to develop a model aimed at promoting the utilisation of e-government by local spheres of government. Based on the literature study and empirical findings, a model was developed and presented in section 7.5.3.

7.4 IMPLICATIONS AND RECOMMENDATIONS OF THE STUDY

7.4.1 Implications

The findings of the study have wide-ranging implications for government and other stakeholders' efforts aimed at promoting the utilisation of e-government. The fact that district municipalities are still at stage 1 of e-government development despite the huge amounts of money invested by government to promote the utilisation of e-government should be a matter of concern for government authorities. In addition, if urban and semi-urban district municipalities, as in the case of this study, are still at

stage 1 of e-government development, it can be presumed that the situation is worse in purely rural district municipalities. This should also be a matter of concern for government leadership and other stakeholders. Furthermore, the fact that there are many people who are not aware of the online services at their disposal and the large number of people who are not making use of the available e-government services provided by the district municipalities should be a matter of concern for top government officials and district municipality officials in particular. Finally, as the research tried to identify the areas of weakness and challenges in the utilisation of e-government, this study serves as a tool for decision- or policy-makers. It can be a tool to guide future e-government policies and strategies.

7.4.2 Recommendations

- ***Access to ICT infrastructure***

Though the Republic of South Africa has a relatively well developed and advanced communication sector compared to many countries in Africa, including Rwanda, the country suffers from enormous imbalances when it comes to access to computers and the internet, a phenomenon commonly called the “digital divide”. The wide disparities in access to ICTs in both South Africa and Rwanda need to be addressed through the equitable distribution of ICT infrastructure in the country, including rural areas. Some measures have been taken, including the establishment of MPCCs. These MPCCs helped people living in previously disadvantaged communities as well as in rural areas to freely access computers and internet services. However, the established MPCCs are relatively very few compared with the number of people who need to use them. It is recommended therefore that the MPCCs should be increased and maintained on a regular basis. In addition, internet-cafés, public libraries, primary, secondary and tertiary academic institutions equipped with computers connected to high-speed internet connection should be increased, especially in rural areas.

- ***ICT literacy***

Ensuring that people have access to computers and the internet does not guarantee that people will make better use of them and benefit from e-government. Computer and internet self-efficacy is one of the prerequisites necessary for making use of e-government services. As the research indicated, people are lacking in these skills. It

is recommended therefore that people should be provided with training opportunities to ensure that they have adequate skills to use the ICT tools (computer and internet) and thus to enable them to make use of available e-government services. In addition, district municipalities' websites should be designed in such a way so as to be as easy as possible to use to meet the needs of the cultural diversity in terms of education, languages and internet experience.

- ***Awareness***

The research findings showed that lack of awareness is a major challenge which negatively affects the utilisation of e-government services because citizens are unlikely to use e-government services that they are not aware of. It is recommended therefore that efforts and money spent by government on promoting e-government should equal the efforts and money spent on promoting awareness, because it is senseless and a waste of money and time to provide online services which are not used. The awareness campaigns should focus on available online services, the benefits associated with the use of online services, the details of the steps involved and the precautions with regard to security and privacy. Furthermore, awareness campaigns should be conducted through interpersonal channels such as meetings between district municipality officials and citizens, workshops and seminars. However, the use of the mass media such as newspapers, radio and television is the most effective way as many people can be reached at once.

- ***Quality of online services***

The quality of information and services provided online by district municipalities' websites was also of critical concern. As information searches (jobs, tenders) on government websites, reading government news, downloading official forms and applying for public services are the most-used e-government services, comprehensiveness, reliability and, most importantly, up-to-datedness of online information are critically recommended. No one can expect people to use online services which are of poor quality. Furthermore, improving quality should go hand in hand with increasing the quantity of online services. District municipalities need to ensure that customers (citizens and businesses) are getting a wide range of information and services online so as to reduce the time and money spent to physically visit district municipality offices for public service. District municipalities

should make progress in moving to the more advanced stages of e-government development, including the provision of more online services, online payment and online consultation and participation.

- ***Smartphones, tablets and laptops penetration***

The research findings showed that most people have access to online information and services using their simple or ordinary cellphones because they cannot afford the high costs of smartphones, tablets, and laptops. However, previous research revealed the limits of ordinary cellphones concerning access and utilisation of e-government services. It is recommended therefore that the importation or manufacturing of those modern ICT devices by local companies should be subsidised in order to increase the affordability, especially for the poor and rural people. The use of these modern devices will allow faster, easier and more convenient use of available online information and services, especially accessing forms and doing online transactions.

- ***Skilled IT personnel***

The successful utilisation of e-government by local spheres of government needs a reasonable number of highly skilled IT personnel. However, the findings showed that the deficient number of highly skilled IT personnel in district municipalities is of critical concern. It is recommended therefore that measures and policies be put in place to attract and retain highly skilled IT personnel. The policies should guarantee a clear career development path for IT personnel as well as competitive remuneration packages. In addition, partnership with IT companies and reputable universities with IT programmes may help local spheres of government to acquire highly skilled IT personnel.

- ***Online customer care***

The findings indicated that online customer care is a challenge as e-mails are not answered and phone calls not answered correctly. It is recommended therefore that government employees, and district municipality employees in particular, need to be trained about online customer care and how to handle customers online. An automated e-mail system informing citizens about the status of their online

applications is recommended. The Department of Home Affairs in South Africa can be a benchmark for district municipalities in this regard.

- ***Monitoring of usage and evaluation of results***

The monitoring of usage and evaluation of results is critical for the sustainability of any government project, including e-government. Most of the time when government projects are implemented it is a great challenge to go back and investigate whether the expected results are being achieved. Even if e-government maturity is still at a low level in the district municipalities surveyed, some online information and services are at present provided *via* district municipality websites. However, none of the selected district municipalities conducted any monitoring of usage and evaluation of results. With proper monitoring and evaluation of results, district municipalities will be able to maximise the impacts of government's huge investment in promoting e-government. Evidence-based decisions from monitoring and evaluation will help to improve the quality and quantity of online services that meet the needs of users and this will improve the usability of online services.

- ***Increase of GDP per capita or per capita income***

Income remains a key determinant of access to technology. The findings of the study showed that a large number of respondents do not utilise the internet because for the majority the internet is considered a luxury and not a necessity. One of the reasons is insufficient income which cannot cover all the expenses. Based on this evidence the following is recommended:

- Government in general, and district municipalities in particular, should find strategies to increase the GDP per capita for their citizens;
- More jobs should be created for young people;
- Entrepreneurship education is recommended and entrepreneurship culture should be inculcated in the young generation as well as in the adult population so that they become job creators rather than job seekers;
- The SMMEs should be supported, especially those initiated by the previously disadvantaged citizens (women for instance);and
- Policies and incentives to promote both domestic and external investments should be designed and implemented. This will boost the creation of more jobs.

Other recommendations

- District municipalities should have a clear and comprehensive e-government policy. The adopted e-government policy will inform e-government strategies and programmes;
- District municipalities should ensure that adequate provisions are made in their annual budgets for renewal, repair, replacement of essential ICT tools and infrastructure in order to guarantee smooth, quick and improved online service delivery;
- All problems identified, such as disconnection of internet, network attacks and virus must be reported to the technical department for follow-up. Reports of disconnection, fraud, cyber-attacks must be reviewed on a monthly basis for follow-up and rectification;
- Selected district municipalities should learn from the best practices of both developed and developing countries and customise them to improve online service delivery;
- District municipalities should set the target in terms of e-government services. For instance, set a target that 60 percent of the services will be available online and 70 percent of the adult population will be using e-government services by 2020. Follow-up should be done and reports made about the number of citizens who are utilising online public services and the challenges faced in order to take corrective measures; and
- Though online services and interactions are recommended, they cannot totally replace traditional ways of service delivery and communication. For example, an ID book or birth certificate can be delivered online, but personal or face-to-face interaction might be necessary for identity authentication. Also, some people (older persons and the illiterate) may for a specific reason prefer to speak to a person rather than to send an SMS or e-mail message. Therefore, multiple channel service delivery mechanisms, such as online channel, traditional channel, SMS text service, social media usage, communication over the phone or *via* mobile phone, communication *via* television and radio should supplement one another and this will expand the choices of access to public information and service, especially among the disadvantaged and vulnerable citizens in rural areas.

7.4.3 A model for promoting utilisation of e-government by local sphere of government

As part of the recommendations based on literature study and empirical findings, a model aimed at promoting the utilisation of e-government was developed. Efforts and policies aimed at promoting e-government should consider and focus on two sides. *Firstly*, there is the supply side which can be government, a government agency and local government as is the case in this study. *Secondly*, there is the demand or consumer side which can be citizens, businesses and other institutions. The effective utilisation of e-government requires the supply side to provide quantity and quality e-government services, but it requires also the demand or consumer side to request and utilise online services provided, because it will be a waste of time and money if the demand side does not request and utilise online services provided by the supply side. Therefore, the recommended factors in the model focused on both demand and supply sides.

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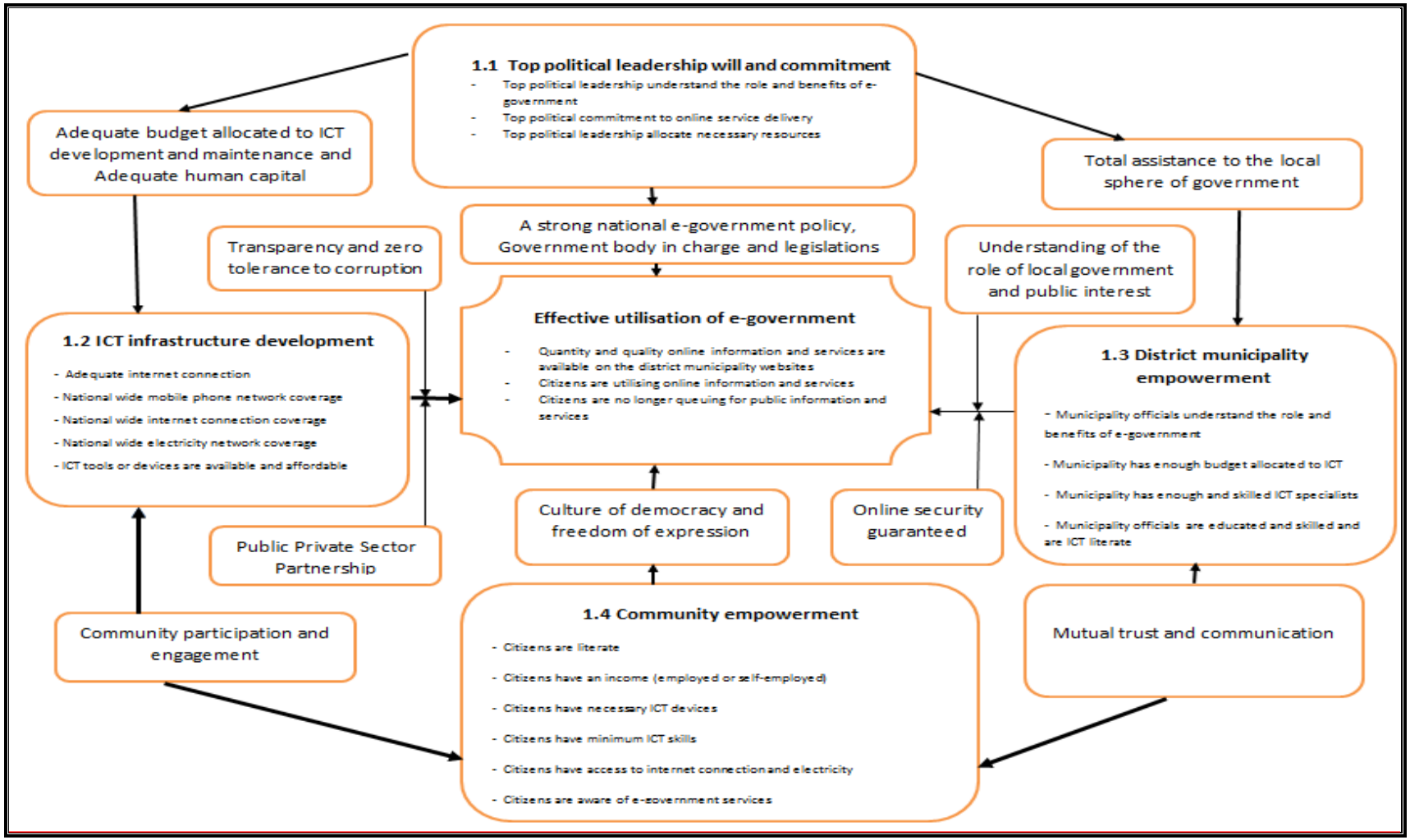
Figure 7.1: A model to enhance the utilisation of e-government services



Source: Researcher's own interpretation

The model proposed in Figure 7.1 attempts to present the key areas and factors which impact on the utilisation of e-government and which policy-makers, academics and other stakeholders in the e-government domain should take into consideration when attempting to promote the utilisation of e-government.

- ***Top political leadership will and commitment to e-government***

The active and total engagement of the top leadership of the country to e-government largely affects the success of e-government. As top leadership authorities are playing a leading championing role in moving forward the nation's e-government agenda, an adequate budget for ICT in general and e-government development in particular will be allocated. Adequate human capital will be made available and will continuously be developed. In addition, because of top leadership involvement, strong national policies and regulatory frameworks will be put in place and the government body or bodies in charge of e-government implementation and coordination will be more empowered. Furthermore, because of the commitment of top leadership to e-government, the local spheres of government will be assisted and accompanied in their e-government development agenda. Without top leadership understanding of the role of e-government and without their commitment to it, success is unlikely to be reached.

- ***ICT infrastructure development***

The lack of ICT infrastructure and access to modern technologies are among the major challenges facing developing countries (Rwanda and South Africa included). Establishing or putting in place modern ICT infrastructure with nation-wide access will boost e-government development. For instance, developed telecommunication infrastructure and nationwide access was one of the strategies which helped the Republic of Korea to reach a fully digitalised public administration with advanced e-government applications, namely Government to Citizens (G2C), Government to Business (G2B) and Government to Government (G2G) and thus to be the top performer in the world since 2012.

In addition, the establishment of modern ICT infrastructure and nation-wide access will require two things, namely discipline and partnership. Since the establishment of modern ICT infrastructure demands a huge amount of money, the procurement

process in this domain tends to be an important area where corruption and embezzlement take place. Therefore, transparency and zero corruption are critical conditions. Furthermore, as stated earlier, the establishment of modern ICT infrastructure demands not only a huge amount of money but also high expertise. Therefore, partnering with the private sector will help to boost ICT infrastructure and will help also the government to save money and that money can be invested elsewhere. In addition, the government will gain from the high expertise of private companies.

Finally, as the established modern ICT infrastructure will need to be protected and maintained, community participation and engagement are critical in this regard.

- ***District municipality empowerment***

The top political leadership commitment to e-government development, adequate allocation of the budget to modern ICT infrastructure, adequate human capital deployment, strong national IT policies and the establishment of modern ICT infrastructure countrywide are not enough *per se* and cannot guarantee that the district municipalities will effectively utilise e-government. The utilisation of e-government by district municipalities requires the empowerment of district municipalities, which involves the following:

- District municipalities need to have an adequate number of highly skilled IT personnel;
- District municipalities need to have sufficient budgets so that an adequate budget is allocated to ICT and e-government development in particular. Because of financial challenges facing many district municipalities it was shown that e-government does not top the list of the district municipality development agenda;
- District municipalities need to have officials or employees who understand the role and benefits of e-government because a lack of minimum understanding results in a lack of interest and bad implementation; and
- District municipalities need to have officials or employees who are ICT literate. Training and upgrading of ICT skills of district municipality officials are critically required.

In addition, an understanding by local officials of the role of developmental local government and the meaning and ways to safeguard public interest are critical. Furthermore, the effective utilisation of e-government requires mutual trust and two-way communication between the district municipality officials and citizens. Through two-way communication, district municipality officials, citizens, businesses and civil society will work together to identify priorities in terms of online services to be provided and the best way to provide them. By clearly articulating and understanding the needs and expectations of each partner, the quantity and quality of online services will be improved and that will positively influence the level of utilisation of e-government services by customers.

- ***Community empowerment***

Ensuring that modern ICT infrastructures are in place and e-government services are provided to citizens is one important issue, but ensuring that people are making use of e-government services is another. All investments and efforts made to promote e-government are senseless and useless unless the customers (citizens) utilise the e-government services provided. The utilisation of e-government requires the empowerment of customers. Community empowerment consists of the two most important factors, namely education and financial empowerment. The empirical findings showed that the low level of literacy, low level of ICT literacy, lack of necessary modern ICT tools because of a low income level are among the major constraints to the utilisation of e-government services by citizens. As stated earlier, an individual is highly unlikely to be an internet user if he or she cannot easily read or write English, if he or she is very poor and if he or she is unemployed. On the other hand, an individual is very likely to be an internet user, if he or she can easily read and write English, if he or she is employed and paid. From this evidence, the community should be empowered through the following:

- Increasing the rate of literacy through access to quality (primary, secondary and tertiary) education by all. The policy already in place with regard to education for all in both South Africa and Rwanda would help to increase the literacy rate. However, it was revealed that everybody's access to poor-quality education cannot contribute to anything good. For instance, if 90 percent of people have completed high or secondary school, but cannot read, write or understand

English or French, this does nothing towards helping the empowerment of people. Access for all to quality education will not only help to increase the rate of literacy *per se*, but also the rate of English or French literacy and that can promote the use of the internet as well as the use of e-government services. According to UN (2012: online), even small improvements in the quality of education will have a substantial, positive long-term impact on innovation and creativity and on countries' overall development;

- Adult Basic Education (ABE) should be more supported and enforced if possible;
- In service ICT training;
- Increasing the GDP per capita or income per capita. Because the poor cannot use the internet and online services, income increase is imperative. According to Stats SA (in Agbobli 2013:52), unemployment as well as underemployment are the most direct causes of poverty. Therefore, jobs should be created so that people are employed and that they have the maximum income to cover their expenses, including internet expenses. In addition, people should be empowered with entrepreneurship skills through training sessions in order to become job creators instead of job seekers;
- Increasing the affordability of modern ICT devices (smartphones, tablets, laptops) by citizens, especially the poor and the disadvantaged, is vital. Furthermore, providing free computers and free internet access at the community level in public places, especially in areas where less advantaged people are found, is also vital. This would help to ensure that the largest possible number of people is making use of e-government services;
- Increasing the ICT literacy rate. People should be trained on how to use a computer and the internet; and
- Increasing the level of awareness. People should be made aware of the benefits of e-government.

Finally, the model suggests the enhanced culture of democracy and freedom of speech and expression. In a country where the culture of democracy and freedom of speech and expression is lacking, e-government is unlikely to mature and allow people to fully benefit from it.

7.5 LIMITATIONS OF THE STUDY

Cooper and Schindler (2011:235) state that all research studies have limitations and this study is not an exception. *Firstly*, the fact that the study was based on a sample of respondents from two district municipalities in South Africa, namely Lejweleputswa and Fezile Dabi and two district municipalities in Rwanda, namely Kicukiro and Kamonyi the conclusions and recommendations are generally limited to these four district municipalities, and can therefore not be generalised. Future research on the topic can take this limit into consideration and therefore target respondents from other district municipalities. *Secondly*, the use of research field assistants who did not have sufficient knowledge about the topic of research may have weakened the quality of information collected. The translation of the questionnaire from English to the language spoken and understood by the respondents may have reduced the quantity and quality of information that would have been collected if the questionnaire had not been translated.

Thirdly, though structured interviews were used to collect qualitative information from interviewees, there was too much and interesting information collected from the discussions with interviewees that should have been voice recorded if the researcher had had voice recorder equipment, but this was not done because of the lack of such equipment. *Fourthly*, the use of the simple random sampling technique showed its limit whereby the randomly selected respondent had no information about the topic of research and that limited his or her interest in answering the questionnaire.

Lastly, though the number was very limited, some respondents were dominated by sentiments when they were answering some of the questions in the questionnaire. Some of the respondents were very positive and everything was appreciated positively (cases were found more in Rwanda) while others were negative and critical and everything was appreciated negatively (cases were found more in South Africa) and that may have reduced the quality and reliability of some of the information, but that cannot jeopardise the total quality, validity and reliability of the research findings.

Despite all these shortcomings, the main objective and co-objectives of the study have been successfully achieved and sound recommendations to promote the utilisation e-government have been formulated.

7.6 FURTHER RESEARCH IMPLICATIONS AND RECOMMENDATIONS

Firstly, it is recommended that further investigation be conducted on how members of the four ethnic groups, namely Whites or Caucasians, Indians, Blacks and Coloureds utilise e-government services.

Secondly, further research is recommended to investigate the nature of the digital divide both in Rwanda and in South Africa and the model to address it.

Thirdly, it is recommended that further investigation be carried out to determine the level of functionality of MPCCs established by the government, their impacts and the level of utilisation by citizens.

Fourthly, public policy-makers, IT companies and other stakeholders from the private sector should investigate the possibility (feasibility and viability) of free access to the internet and the donation of smartphones, tablets and laptops to the poor in order to boost both internet and modern ICT devices penetration.

Fifthly, further investigation is needed to determine the ICT skills gap and ICT training needs for local government officials.

Lastly, as there is a policy of education for all, further research is recommended to investigate the possibility of a policy of ICT skills for all.

7.7 CONCLUDING REMARKS

In today's information age and knowledge society, local spheres of government have to be at the forefront of making use of modern ICTs in order to effectively and efficiently address the changing and increasing needs and expectations of citizens. Local government, being the centre and cornerstone of service delivery and the channel which government uses to improve people's lives, needs to be developmental and modernised through new ICTs. The utilisation of e-government by local spheres of government in the developed countries, such as France, South Korea and England, has played an important role not only in streamlining public administration but also in enabling and enhancing the quality of service delivery to citizens. However, despite huge investments in ICT by the government, the local spheres of government in both South Africa and Rwanda are still struggling to utilise ICT in order to deliver better services to citizens. Citizens express their

dissatisfaction with service delivery through strikes and community protests which are often reported in the media.

The aim of the study was to determine and compare the level of utilisation of e-government by the selected district municipalities in South Africa and Rwanda. In addition, from the research findings a model for the effective utilisation of e-government by the selected district municipalities was developed. The main objective and nine co-objectives of the study were attained through the data collected by using the three main data collection techniques, namely documentary, survey and structured interviews. The simple random sampling method was used to select 400 respondents and all participated in answering the questionnaire. In addition, the judgemental sampling method was also used to select 40 interviewees who were officials from the four selected district municipalities.

The main research findings were:

- Level of e-government maturity for the selected district municipalities was still very low, whereby the online services provided were limited and 95 percent of the available online services were at stage 1 of e-government development.

- Based on the research findings, the low level of utilisation of e-government by the selected district municipalities was found to be due to three major factors, namely the low level of ICT literacy of local government officials; an insufficient budget which is the reason that e-government is not among the top priorities on the agenda of district municipalities; and a shortage of skilled IT personnel.

- Level of request and utilisation of available online services by citizens was very low and this situation was common to all district municipalities surveyed.
- From the research findings, the very low level of utilisation of e-government services by citizens was found to be due to five major factors, namely low level of literacy, especially English and French; very low level of income (poverty); lack of awareness; ICT illiteracy; and lack of modern ICT devices.

Finally, based on the research findings the recommendations were formulated and all focused on three important domains, namely access for all to quality education, access for all to modern ICT infrastructure and devices and access for all to income generating activities, such as permanent employment.

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Appendices

See questionnaire on next page.

QUESTIONNAIRE FOR THE SURVEY

Purpose

The purpose of this questionnaire is to determine and compare the level of utilisation of e-government by selected district municipalities in South Africa and in Rwanda.

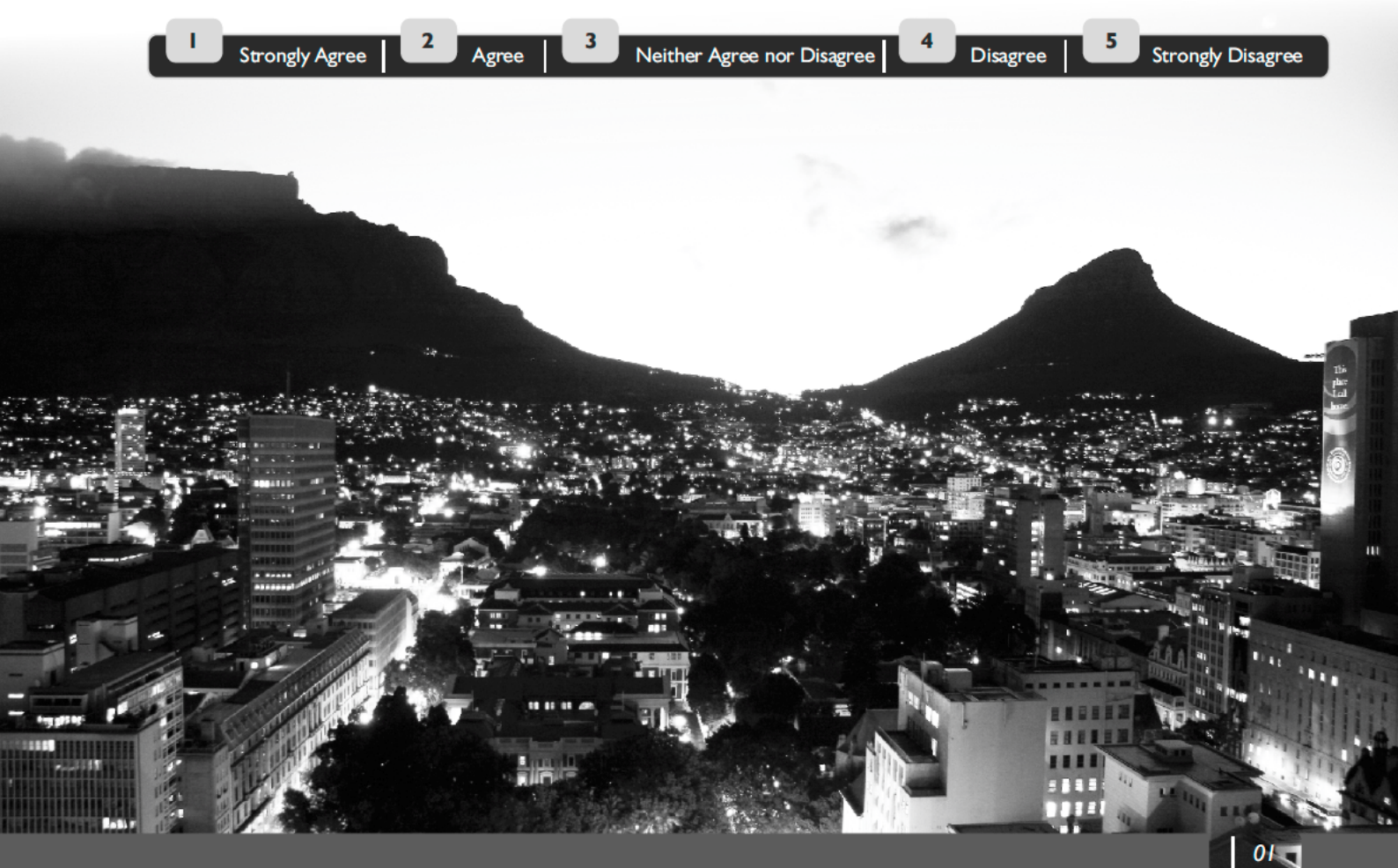
You are requested to provide accurate responses, so as to enable the researcher to determine the gaps/challenges in the selected district municipalities and subsequently provide suitable solutions.

Instructions

- For each of the following questions please mark the answer that comes closest to the way you feel about the issue.
- There are no "right" or "wrong" answers. Please answer the questions as honestly as possible.
- Mark your responses by placing a cross (X) in the appropriate box.
- If you wish to make additional comments on any of the specific question(s), use the space provided at the end of the questionnaire.
- If you do not understand any of the questions or how to complete the questionnaire the researcher will assist you.

Rating Scale used

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree



1. BIOGRAPHICAL INFORMATION

Central University of Technology, Free State

1.1 Residence (District municipality): .....

1.2 Gender ☐ Male ☐ Female

1.3 Age group ☐ 18-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ Other

1.4 Education level

☐ Not educated in formal school ☐ Primary ☐ Secondary or High school
☐ Bachelor Degree ☐ Master's degree ☐ Doctorate
☐ Other

1.5 Profession

☐ Self-employed ☐ Student ☐ Employee in public sector
☐ Employee in private sector ☐ Unemployed

1.6 Estimated monthly income

☐ R1000 - R3000 ☐ R4000 - R7000 ☐ R8000 - R11000 ☐ R12000 - R15000 ☐ R16000 +

2. COMPUTER AND INTERNET LITERACY

Category 1: Computer and internet languages (English and French) literacy

2.1.1 English:	1. Not at all	2. Fair	3. Good	4. Excellent
Speak	☐	☐	☐	☐
Read	☐	☐	☐	☐
Write	☐	☐	☐	☐

2.1.2 French:	1. Not at all	2. Fair	3. Good	4. Excellent
Speak	☐	☐	☐	☐
Read	☐	☐	☐	☐
Write	☐	☐	☐	☐

Category 2: Computer and internet literacy and level of access

2.2.1 How well can you operate and use the computer (desktop or laptop)?

☐ Very well ☐ Fairly well ☐ Not at all

2.2.2 Do you have access to the computer (desktop or laptop) whenever you need it?

☐ Yes, always ☐ Sometimes ☐ Never
☐ It is difficult to access a computer

2.2.3 How good are your internet skills?

☐ I don't know what the internet is ☐ Poor ☐ Satisfactory
☐ Good ☐ Excellent

2.2.4 How do you access the internet when y

Please indicate your answer by marking the appropriate box with an X

- ☐ I don't need the internet
- ☐ I use my mobile phone
- ☐ I use my smartphone
- ☐ I use my tablet
- ☐ I use my laptop at home or at the office
- ☐ I use the desktop at home
- ☐ I use the desktop at the office
- ☐ I use the desktop at school
- ☐ I go to the cyber-café
- ☐ I go to the Multi-Purpose Community Centre (MPCC) or Tele-centre

Category 3: Skills to use a computer and internet for e-government services

(In the absence of computer skills and minimum experience in the use of internet, the ordinary citizen will not arrive at an intention to use e government services. The following questions aim to determine whether respondents have minimum skills to use a computer and internet for e government services)

1 Strongly Agree | 2 Agree | 3 Neither Agree nor Disagree | 4 Disagree | 5 Strongly Disagree

2.3.1. I have gone through formal training programs about how to use a computer and the internet	1	2	3	4	5
2.3.2 I have maximum knowledge and skills to use a computer and the internet	1	2	3	4	5
2.3.3 I know how to apply for online services	1	2	3	4	5
2.3.4 I know how to download the information and government form(s) that I may need from the district municipality website(s).	1	2	3	4	5

3. LEVEL OF AWARENESS OF E-GOVERNMENT

3.1 How aware are you of e-government and of the website(s) of your district municipality?

- ☐ Very aware
- ☐ Aware
- ☐ Not very aware
- ☐ Not informed at all

3.2 If you are aware of the above, to what extent do you agree or disagree with the following statements?

1 Strongly Agree | 2 Agree | 3 Neither Agree nor Disagree | 4 Disagree | 5 Strongly Disagree

3.2.1 I know the benefits of using the district municipality e-government website(s)	1	2	3	4	5
3.2.2 I am aware of the reason(s) why the district municipality decided to use e-government	1	2	3	4	5
3.2.3 I am aware of online information and services available on the district municipality's website(s)	1	2	3	4	5

3.3 If you are aware, how have you been informed?

3.3.1 I have gone through an awareness program(s) about e-government.	1	2	3	4	5
3.3.2 I have come across awareness campaign(s) on how to use and benefit from e-government.	1	2	3	4	5

3.4 Other sources of information about the di cipality website(s)

(Please indicate your answer by marking the appropriate box with an X)

3.4.1 Through my personal search ☐

3.4.2 Through my friend who visited the website ☐

3.4.3 Through my neighbour who used the website ☐

3.4.4 Through radio or television ☐

3.4.5 Through local newspaper(s) ☐

3.4.6 Through meetings with district municipality officials ☐

3.4.7 Through seminars or workshops organised by the district municipality ☐

4. LEVEL OF ACCESS AND UTILISATION OF E-GOVERNMENT SERVICES

4.1 To what extent do you request and utilize online information and services provided by the district municipality's website(s)?

☐ Most of time ☐ Sometimes ☐ Rarely

☐ I have never requested such services

4.2 If you have requested and utilised online services, give an example of the online service requested and utilised.

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5. FACTORS THAT DETERMINE THE UTILISATION OF E-GOVERNMENT SERVICES

5.1 Availability of ICT devices and other infrastructure necessary for the use of e- government services

(Lack of ICT tools or devices such as computer, laptop, smart phone etc. and other infrastructure such as internet connection and electricity might limit the use of e government services. The following questions aim to evaluate whether the respondents own modern ICT devices and have access to infrastructure necessary for the use of e government services).

Please indicate your level of agreement with the following statements:

1 Strongly Agree | 2 Agree | 3 Neither Agree nor Disagree | 4 Disagree | 5 Strongly Disagree

5.1.1 I have a personal computer (desktop) at home	1	2	3	4	5
5.1.2 I have a personal laptop	1	2	3	4	5
5.1.3 I have easy access to a computer with high- speed internet connection at my workplace	1	2	3	4	5
5.1.4 I have easy access to a computer (desktop or laptop) with high-speed internet connection at home	1	2	3	4	5
5.1.5 I can have easy access to a computer with high- speed internet connection at a cyber-café	1	2	3	4	5
5.1.6 I can have easy access to a computer with high- speed internet connection at MPCC or community tele-centre	1	2	3	4	5
5.1.7 I have electricity at home all the time	1	2	3	4	5
5.1.8 The electricity is often disrupted and it is unreliable	1	2	3	4	5
5.1.9 Internet connection is often disconnected and it is slow	1	2	3	4	5

5.2 Affordability of ICT devices

5.2.1 How would you rate the purchasing price of a computer or laptop?

☐ Very expensive	☐ Expensive	☐ Cheap	☐ Very cheap

5.2.2 How would you rate the purchasing price of a smartphone or a tablet?

☐ Very expensive	☐ Expensive	☐ Cheap	☐ Very cheap

5.3 Affordability of infrastructure such as internet and electricity

5.3.1 How would you rate the costs of internet connectivity?

☐ Very expensive	☐ Expensive	☐ Cheap	☐ Very cheap

5.3.2 How would you rate the costs of electricity?

☐ Very expensive	☐ Expensive	☐ Cheap	☐ Very cheap

5.4 Perceived usefulness of e-government services

(Unless e government is perceived as more beneficial and advantageous compared to traditional service delivery channels or systems, citizens are unlikely to use e government services. The following questions aim to determine whether respondents perceive e government as useful or not)

Please indicate your level of agreement with the following statements:

1 Strongly Agree	2 Agree	3 Neither Agree nor Disagree	4 Disagree	5 Strongly Disagree

5.4.1	Using e-government services (online services) would consume too much of my time and money.	1	2	3	4	5
5.4.2	Electronic service delivery is useful to me because I have access to government information and services from anywhere and at any time (24/7) convenient to me.	1	2	3	4	5
5.4.3	Using e-governmentservicesismorecostly than using traditional service delivery methods (physical visit to local government offices).	1	2	3	4	5
5.4.4	Using e-government services is beneficial because it limits opportunities for favouritism and corruption.	1	2	3	4	5
5.4.5	Interacting face-to-face with district municipality officials is preferable to interacting with them online.	1	2	3	4	5
5.4.6	Public money spent on e-government websites should have been used for other activities such as construction of houses, provision of the water, electricity etc.	1	2	3	4	5
5.4.7	Using e-government would promote democratic practices through public participation and consultation.	1	2	3	4	5
5.4.8	The utilization of e-government services would facilitate the implementation of Batho Pele principles.	1	2	3	4	5
5.4.9	The utilization of e-government services would reduce bureaucracy and paper-based work and therefore reduce long queues in municipality offices and result in better and quicker service delivery.	1	2	3	4	5

5.5 Perceived difficulties in the use of e-gov[illegible]vices

(Perceived usefulness of e-government by the citizens is not enough per se, but the e-government service should be perceived as easier to learn and to utilise. The following questions aim to determine whether the e-government website of the district municipality is perceived by the respondents as easy to learn and to use)

Please indicate your level of agreement with the following statements:

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

5.5.1	It is easy to navigate the district municipality website(s) without any difficulties.	1	2	3	4	5
5.5.2	The procedures to follow to request and receive online government services and information from the district municipality website are easy to learn and apply.	1	2	3	4	5
5.5.3	It is easy to download forms, fill in forms and download reports and other necessary documents from the municipality website(s).	1	2	3	4	5
5.5.4	It is easy for citizens to post comments, questions and complaints regarding on poor online service delivery provided by the district municipality.	1	2	3	4	5

5.6 Perceived quality of online information and services provided by the district municipality's website

(Content, presentation, accuracy and relevancy of e government services are the determinant factors of users' satisfaction that eventually leads to the utilisation of e government services. The following questions aim to determine whether online information and services posted on the district websites are of quality or not and inspire the citizens to use them or not)

Please indicate your level of agreement with the following statements:

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

5.6.1	Up-to-date contact details of district municipality officials and employees are clearly provided on the district municipality website.	1	2	3	4	5
5.6.2	District municipality publications (annual report, budget report) and other information are regularly posted on the website and are up-to-date.	1	2	3	4	5
5.6.3	The website of the district municipality provides all relevant information and online services that users (citizens) need.	1	2	3	4	5
5.6.4	Online information and services available on the district municipality website are outdated and irrelevant for users (citizens).	1	2	3	4	5

5.7 Perceived online customer care

(Unless the citizens receive a higher level of online customer care when utilising e government services, they will prefer and go back to traditional government service delivery channels (physical visits to district offices). The following questions aim to evaluate whether respondents who use e government services from the district municipality website receive adequate online customer care)

Please indicate your level of agreement with the following statements:

1	2	3	4	5
Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

5.7.1	District officials and employees are easily accessible online	1	2	3	4	5
5.7.2	Citizens' online requests and/or complaints are quickly received, processed and answers are quickly provided.	1	2	3	4	5
5.7.3	Online requests are not processed until someone physically visits the district offices.	1	2	3	4	5
5.7.4	No feedback or notice message to indicate whether online requests were received.	1	2	3	4	5
5.7.5	District officials are courteous and friendly when dealing with citizens online.	1	2	3	4	5

5.8 Perceived security and privacy

(Unless the users (citizens) are ensured of privacy and security when using e government services, they are unlikely to use online services. The following questions aim to determine whether respondents perceive online interaction and transactions via the district municipality website as secure and trustworthy or not).

Please indicate your level of agreement with the following statements:

1 Strongly Agree	2 Agree	3 Neither Agree nor Disagree	4 Disagree	5 Strongly Disagree

5.8.1	I trust district municipality officials and IT technicians with regard to their credibility and integrity.	1	2	3	4	5
5.8.2	I would hesitate to disclose personal information on the district municipality website.	1	2	3	4	5
5.8.3	There are cases of hackers, identity theft, disclosure, sharing or abuse of personal information of users of e-government services.	1	2	3	4	5
5.8.4	Issues of security and privacy of the e-government website of the district municipality is something to doubt for.	1	2	3	4	5

5.9 Additional access facilities

(The utilisation of e government services by the citizens requires some extra facilities for individuals with different levels of education and ethnic backgrounds to feel comfortable to use the services. The following questions aim to evaluate whether thee government website of the district municipality provides extra facilities for different category of citizens).

Please indicate your level of agreement with the following statements:

1 Strongly Agree	2 Agree	3 Neither Agree nor Disagree	4 Disagree	5 Strongly Disagree

5.9.1	The website of the district municipality provides necessary links to other government websites for further searches and additional information.	1	2	3	4	5
5.9.2	The district municipality website provides options for persons with disabilities (for instance persons with impaired vision) to benefit from e-government services.	1	2	3	4	5
5.9.3	The content on the website is only presented in the local vernacular.	1	2	3	4	5
5.9.4	The district municipality website provides an option to use other mother tongues.	1	2	3	4	5
5.9.5	The content posted on the district municipality website is only presented in a foreign language such as English, French or other foreign languages.	1	2	3	4	5

6. ONLINE INFORMATION AND SERVICES AVAILABLE ON E-GOVERNMENT WEBSITE OF THE DISTRICT MUNICIPALITY

(Availability of online services starts from the creation of the district website (online presence) to the possibility of the website allowing online interactions and online transactions. The following questions aim to determine the types of online information and services provided to the citizens so far by the district municipality website(s).

Please indicate your level of agreement with the following statements:

1 Strongly Agree	2 Agree	3 Neither Agree nor Disagree	4 Disagree	5 Strongly Disagree

6.1	Your district municipality is currently online (has a website(s)).	1	2	3	4	5
6.2	Contact details of district municipality officials and employees are well posted on the district municipality website.	1	2	3	4	5
6.3	Policies and regulations are available online.	1	2	3	4	5

6.4	Citizens can find and read about all decisior				listrict municipality organs on the district municipality website.
6.5	Citizens can find and read about updated news and events related to their district municipality on the district website.				
6.6	Procurement announcements are available online.				
6.7	Job vacancies are posted on the district municipality website and are regularly updated.				
6.8	Citizens can download official forms from the municipality website.				
6.9	Citizens can upload completed forms.				
6.10	Citizens can contact officials via the internet and can electronically interact with them.				
6.11	Citizens can do online payments and other online transactions through the district municipality website.				
6.12	Citizens can share views, discuss and give comments on the district municipality's policies, programmes on the district municipality website.				
6.13	Citizens can lodge complaints against misconduct of officials, corrupt practices and mismanagement via the district municipality website.				
6.14	The website of the district municipality provides educational information on drug abuse, gender equality, HIV/AIDS, child abuse or family violence.				
6.15	Citizens can access and play videos (official ceremonies and other official events) on the district municipality website.				

7. IMPACT OF UTILISATION OF E-GOVERNMENT ON SERVICE DELIVERY

(The impact of effective utilisation of e government on service delivery are numerous. The following questions aim to determine whether the utilisation of e government by the district municipality has had positive impact on service delivery or not).

Please indicate your level of agreement with the following statements:

1 Strongly Agree | 2 Agree | 3 Neither Agree nor Disagree | 4 Disagree | 5 Strongly Disagree

7.1	Citizens' participation in decision making has improved.				
7.2	Access to government information and services has improved.				
7.3	Bureaucracy and paper work have minimized.				
7.4	Favouritism and corruption in service delivery have reduced.				
7.5	Time and money spent to obtain government information and services have reduced.				
7.6	District municipality officials and employees are more transparent and more accountable.				
7.7	Communication and interaction between citizens and municipality's officials have improved.				
7.8	Long queues waiting for information and services have reduced.				
7.9	Misuse/waste of public money has reduced.				

8. CONSTRAINTS FOR EFFECTIVE UTILISATIO[Central University of Technology, Free State]VERNMENT BY BOTH SUPPLY AND DEMAND SIDES

(The effective utilisation of e government might be impeded by different barriers. The following questions aim to determine the barriers).

8.1 Constraints for effective utilisation of e-government by the selected district municipalities (supply side).

Note: *If you are an ordinary citizen, do not answer this question, but rather proceed to question 8.2. However, if you are an official at local government, you are requested to answer this question.*

Considering the level of utilization of e government by your district municipality, please indicate your rating on the following barriers

1	Not a barrier	2	Important barrier	3	Very important barrier

Barriers			
8.1.1 Lack of ICT infrastructure at the district municipality level.	1	2	3
8.1.2 Inadequate ICT infrastructure of the district municipality.	1	2	3
8.1.3 Inadequate utilisation of available ICT tools.	1	2	3
8.1.4 Resistance and fear of change by district municipality officials.	1	2	3
8.1.5 Shortage or inadequate human skills (qualified IT staff).	1	2	3
8.1.6 High level of turnover of IT professionals who resign from municipalities to go to the private sector.	1	2	3
8.1.7 Low IT literacy among district municipality officials.	1	2	3
8.1.8 Low computer literacy among district municipality officials	1	2	3
8.1.9 High illiterate rate among citizens.	1	2	3
8.1.10 Reluctance to share information with the citizens and between district municipality officials.	1	2	3
8.1.11 Lack of culture of openness, transparency and accountability.	1	2	3
8.1.12 Culture of corruption and favouritism.	1	2	3
8.1.13 Shortage of financial resources at the district municipality.	1	2	3
8.1.14 Lack of knowledge by the district municipality officials about e-government.	1	2	3
8.1.15 Availability and reliability of internet connectivity.	1	2	3
8.1.16 Availability and reliability of electricity.	1	2	3
8.1.17 High cost of internet connectivity.	1	2	3
8.1.18 Lack of political support for e-government.	1	2	3
8.1.19 E-government application and system not initiated locally but imported from outside.	1	2	3
8.1.20 Uncertainty about security and privacy of e-government websites.	1	2	3
8.1.21 Donor funding dependency.	1	2	3

8.2 Constraints for effective utilisation of e-g services by the citizens (demand side).

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Considering the level of utilization of e government services by the citizens, please indicate your rating on the following barriers

1 Not a barrier | 2 Important barrier | 3 Very important barrier

Barriers

8.2.1	High illiteracy rate among citizens.	1	2	3
8.2.2	High costs of internet.	1	2	3
8.2.3	Lack of ICT tools (computer, smart phones etc.) among citizens.	1	2	3
8.2.4	Resistance and fear of change by the citizens.	1	2	3
8.2.5	Lack or low level of knowledge of ICT among citizens.	1	2	3
8.2.6	Lack of awareness about e-government and the benefits of e-government services.	1	2	3
8.2.7	Computer and internet illiteracy among citizens.	1	2	3
8.2.8	Content on the websites mainly presented in languages that citizens do not understand very well.	1	2	3
8.2.9	Lack of trust of citizens towards district officials (their competencies, honesty and integrity).	1	2	3
8.2.10	Lack of culture of openness and participation among citizens.	1	2	3
8.2.11	Shortage of financial resources among citizens.	1	2	3
8.2.12	Inadequate and erratic power supply in rural areas.	1	2	3
8.2.13	Lack or erratic internet connection in rural areas.	1	2	3
8.2.14	Irrelevant content on the district municipality websites.	1	2	3
8.2.15	E-government applications are difficult to use.	1	2	3
8.2.16	Lack of reliability of e-government services.	1	2	3
8.2.17	Lack of communication and sensitization by the district municipality officials to the citizens about the existence of district municipality websites and online services available.	1	2	3
8.2.18	Lack of citizens' trust and confidence towards using e-government services.	1	2	3
8.2.19	Lack of citizens' interest due to cultural values/ customs/ traditions.	1	2	3

Thank you very much for taking part in this survey. Your time and contributions are highly appreciated.

STRUCTURED INTERVIEW SCHEDULE FOR LOCAL GOVERNMENT OFFICIALS

Purpose of the structured interview

The main purpose of the interview is to determine the level of awareness of the district municipality officials about e-government.

Note to the respondent

- Your participation in this interview is highly appreciated.
- Your contributions to the interview will remain private and confidential.
- Your responses will be used for the purpose of the thesis only.
- You are requested to feel comfortable to provide enough and accurate information.

Instructions

- Read each question carefully.
- If you wish to make additional comments on any of the questions, use the space at the end of the page.
- If you do not understand any of the questions the researcher will assist you.

SECTION A: AWARENESS OF E-GOVERNME

1.1 How aware are you of e-government?

- ☐ Very aware
- ☐ Fairly aware
- ☐ Not at all

1.2 How important is the role of e-government in the improvement of public service delivery?

- ☐ Very important
- ☐ Important
- ☐ Not so important

1.3 Do you know the reason(s) why your district municipality decided to utilise e-government?

- ☐ Yes
- ☐ No

1.4 Considering the current level of the utilisation of e-government in your district municipality, what do you think are the main constraints for effective utilisation of e-government by the local sphere of government?

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SECTION B: COMPUTER AND INTERNET LITERACY

2.1 How well can you operate a computer and utilise the internet for online service delivery purposes?

- ☐ Very well
- ☐ Well
- ☐ Not well at all

2.2 What do you think about the ICT literacy level of the officials at the local sphere of government?

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2.3 Do you want to improve your computer and internet skills?

- ☐ **Yes**
- ☐ **No**

Thank you very much for taking part in this interview.