# E-government Challenges Faced by Selected District Municipalities in South Africa and Rwanda

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## ABSTRACT

The use of Information Communication Technology (ICT) in the different spheres of government is being seen as a way of widening access to government information and services in developed countries. However, e-government development remains at a very low level in the local sphere of government in both South Africa and in Rwanda. This article addresses the issues of ICT use in the local sphere of government and focuses specifically on the constraints in the successful use of ICT for delivering and utilising online government information and services. This article reflects upon the lessons learned from a comparative case study undertaken in the two district municipalities of Lejweleputswa and Fezile Dabi in South Africa and the two district municipalities of Kicukiro and Kamonyi in Rwanda. To determine and compare the challenges faced in the utilisation of e-government by the four selected district municipalities both in South Africa and Rwanda, two types of respondents have been targeted. The simple random sampling method was used to select 400 respondents who were ordinary citizens living in the townships, while the judgemental sampling method was used to select 40 interviewees who are officials in district municipalities. This article identifies a number of constraining factors surrounding practical use of online government information and services, namely ICT illiteracy; lack or limited access to modern ICT devices due to low income, lack or limited access to ICT infrastructures; low level of general literacy among citizens, English illiteracy and lack of awareness of available

e-government services. To address the identified constraining factors, policies aimed at enhancing access for all to quality education (primary, secondary and tertiary); policies aimed at improving access for all to ICT infrastructure and electricity; policies aimed at enhancing ICT literacy among citizens as well as local government officials, policies aimed at producing low-cost modern ICT devices to enable the vast majority of citizens to have access; and policies aimed at improving GDP per capita; are crucial.

## INTRODUCTION

The provision of government services and information to members of the public 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 ICT 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.

According to Barnard, Cloete and Patel (2003:35), the demand for e-government services in South Africa has arisen from requirements to: (i) Improve the efficiency and quality of government services; (ii) Ensure that government services are delivered to all levels of society anytime and anywhere in South Africa; (iii) Enhance government's portfolio of services; (iv) Consolidate transparency and accountability in the delivery of government services; and (v) 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.

Like the government of South Africa, the government of Rwanda (GoR) also strongly believed that ICT could enable Rwanda to advance the key stages towards industrialisation. The GoR believed that ICT would help to achieve 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).

While the use of ICT by the public sector (especially central government agencies) and the private sector has dramatically improved in the last 15 to 20 years in both South Africa and in Rwanda (Anon 2015:online), the use of ICT by the local sphere of government in both countries is still problematic. However, 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.

As a result, among others, a lack of, or poor utilisation of modern ICTs by the local sphere of government, community protests because of a lack of, or poor service delivery, corruption, misuse of public money and lack of or poor community participation in decision-making; are experienced and reported in the media every day and are increasing year-on-year especially in South Africa (Karamoko and Jain 2011:2) and in Rwanda (Tabaro 2012: online).

## PROBLEM STATEMENT AND RESEARCH OBJECTIVES

Increasing violent community protests throughout the country, because of failure to deliver services or poor service delivery; remain a serious concern for government, especially in South Africa. 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. In addition, 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 opportunities of employment, tenders, bursaries, health care, education and other services. This will probably worsen the existing economic inequalities, digital divide, and will generate more community protests in the future.

Measures aimed at improving utilisation of e-government can only be successful if factors or challenges that impede the utilisation by both supply side (municipality) and demand side (citizens) are fully identified and understood. The main objective of this article is to investigate the important challenges to the utilisation of e-government in the local sphere of government. The specific objectives are (i) to examine if there are significant differences in challenges between the selected district municipalities; (ii) to make recommendations

on how to overcome the identified challenges and promote, therefore, the utilisation of e-government in the local sphere of government.

## LITERATURE REVIEW

Since 1990, attention has been given to e-government which is defined as 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). 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 and Singh 2013:43). In this regard, the government of South Africa has understood that e-government is part of various public service transformations guided by the principle of public service for all (White Paper on Transforming Public Service Delivery1997). The White Paper on Transforming Public Service Delivery1997, also known as the *Batho Pele White Paper* or the *Batho Pele Principles,* is based on eight national service delivery principles (White Paper on Transforming Public Service Delivery1997:1–3).

## E-GOVERNMENT AND BATHO PELE PRINCIPLES

The failure of local municipalities to provide good public services to the citizens implies that they have failed to implement the eight *Batho Pele Principles*. However, the effective utilisation of ICT by the local sphere of government would help to implement the *Batho Pele Principles* such as: (i) ***Consultation***- One of the reasons cited by protesters is a lack of or poor consultation (Karamoko and 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; (ii) ***Access***- There is increasing expectation of citizens for easier access to more public information and public service from anywhere and anytime. The access principle is addressed in the Batho Pele White Paper and in sections 32(1)(a) and 146(2)(c)(v) of the *Constitution of the Republic of South Africa*, 1996. It is also stated that all citizens shall have equal access to services and the services

must be provided impartially, fairly, equitably 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 section 32(1)(a) 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 24-hour basis, seven days a week and at all accessible locations; (iii) ***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 government, thus saving taxpayers money. According to Moon and Norris (2005:51), the use of e-government can 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 online procurement; (iv) **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; and (v) **Value for money**- This principle implies that available resources should be put to good use. Digitising procurement can help to remedy the problems of corruption, irregular and wasteful expenditure in the supply-chain management process in local government. E-government can also simplify the process of tax collection and can help to diminish the level of bureaucracy (Heeks 2002:4).

## CHALLENGES OF E-GOVERNMENT DEVELOPMENT IN BOTH SOUTH AFRICA AND RWANDA

South Africa was a recognised African leader in the use of ICT in 2012 and is ranked among the top performers not only in Africa but also among middle-income countries (UN 2012). In this context, Rwanda was ranked the best performer in terms of online service delivery among the categories of low-income countries according to the UN e-government survey in 2014 (UN 2014: online). Therefore, the aim to compare the two countries through the

selected district municipalities was to determine 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.

## Challenges for e-government development in South Africa

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

- ***Digital divide*** -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 unable to benefit from ICT;
- ***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 (especially Australia and Germany) 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;
- ***Adult literacy*** – Adult literacy which may indirectly reflect levels of computer literacy is estimated at 85.1%, but there are vast differences between rural and urban areas. In rural areas the adult literacy rate is less than 80%. In addition, limited skills in reading and comprehension of English are limiting a significant number of people in rural areas to utilise e-government services (Duff 2014: online); and
- ***Income per capita (GDP per capita)*** - Income remains a key determinant of access to technology. A study in European countries found that low income was the single most important barrier to acquiring basic technology with a high-income household four times more likely to have access to a computer and the internet than a low-income one (UN 2014:online).The 2016 figures estimate South Africa's Average Monthly Gross Wage at R17 422 (Stats SA 2016: online). 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.

## 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% of Rwandans are engaged in subsistence agriculture and live in rural areas. Between 70% and 80% of the population speak 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% of the population had access to electricity in 2010 but this percentage increased to 17% in 2013 and to about 27% in 2015. However, power outages still remain a big challenge (National Institute of Statistics of Rwanda 2014: online);
- ***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 very low, it is less than US$800 per annum (National Institute of Statistics of Rwanda 2014: online). The limited financial capacity of the majority of citizens constrains them to own the necessary ICT devices and to use e-government services;
- ***Inadequate ICT skills*** - Rwanda still lacks sufficient ICT skilled personnel to drive ICT development;
- ***Low ICT awareness and usage*** - Low levels of literacy among the population and, specifically low levels of ICT literacy, limit the majority of Rwandans to be aware of available e-government services and to utilise them. In addition, as most ICT applications and internet content are in foreign languages (especially English), a large number of the population, especially those in rural areas cannot benefit from ICT and the internet in particular (RURA 2015: online); and
- ***Lack or insufficient ICT infrastructures***, ***especially in rural areas***- Rural areas are still struggling to have access to internet connection and adequate mobile phone networks.

**Table 1: 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 South 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 South 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 South Korea | 100% | 82% | 77% | 88% | **86%** |

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

As a result of the challenges mentioned, e-government maturity in both South Africa and Rwanda is still at a low level. Table 1 presents and compares the level of e-government maturity between Rwanda and South Africa.

The data in Table 1 shows that the level of e-government development is still low both in Rwanda and in 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. Furthermore, if compared with the leader in the world (Republic of South Korea) one can see that South Africa and Rwanda are still far behind.

## THEORETICAL FRAMEWORK FOR THE USE OF E-GOVERNMENT SERVICES

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 an 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.

As far as this article is concerned, it is important for the researcher to gain a better understanding of the factors that would promote or hinder the use of an innovation, specifically e-government. A number of models and theories on technology acceptance exist, but only two technology models are briefly discussed in this article, namely Diffusion of Innovation Model (DoI) by Everett Rogers (2003) and Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris and Davis (2003).

According to Rogers's theory of DoI (Rogers 2003:20), the innovation-decision process involves five stages: (i) knowledge or awareness; (ii) persuasion; (iii) decision; (iv) implementation; and (v) confirmation. He further maintains that 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. In this regard, Ton and Spil (2006:2) argue that 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. Therefore, for diffusion of an innovation to be successful a particular type of awareness is needed. In this context, Rogers (2003:21) further argues that the questions (What? How? and Why?), form the following three types of knowledge which

are the preconditions for an individual to decide to adopt an innovation: (i) ***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; (ii) ***How-to-knowledge:*** How-to-knowledge contains information about how to use an innovation correctly. According to Sahin (2006:16), the chances of an innovation being adopted are increased when individuals have a sufficient level of how-to-knowledge.

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 (ICT literacy) 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 awareness- knowledge and how-to-knowledge.

Furthermore, Rogers in his DoI model proposes five attributes of an innovation that determine its rate of adoption, namely relative advantage, compatibility, complexity, trialability and observability. An innovation which has those five attributes will be adopted more rapidly than other innovations. Diffusion scholars have found relative advantage to be one of the best predictors of an innovation's rate of adoption (Chuttur 2009:38). In this regard, 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 greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be. As far as relative advantage is concerned, 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 over the traditional ways of service delivery.

Another attribute of an innovation that determines its rate of adoption is complexity. Complexity is the degree to which an innovation is perceived as relatively difficult to understand and to use (ease of use) The more complicated an innovation is to learn and to use, the lower the rate of adoption (Rogers 2003:242). 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, a multilingual option is very important, especially in South Africa, given the

fact that South Africa has 11 official languages (section 6(1) of the Constitution, 1996). However, the perceived complexity or ease of use is determined among others by the level of education. Less educated people will always perceive an innovation such as e-government as difficult to use and therefore, not useful.

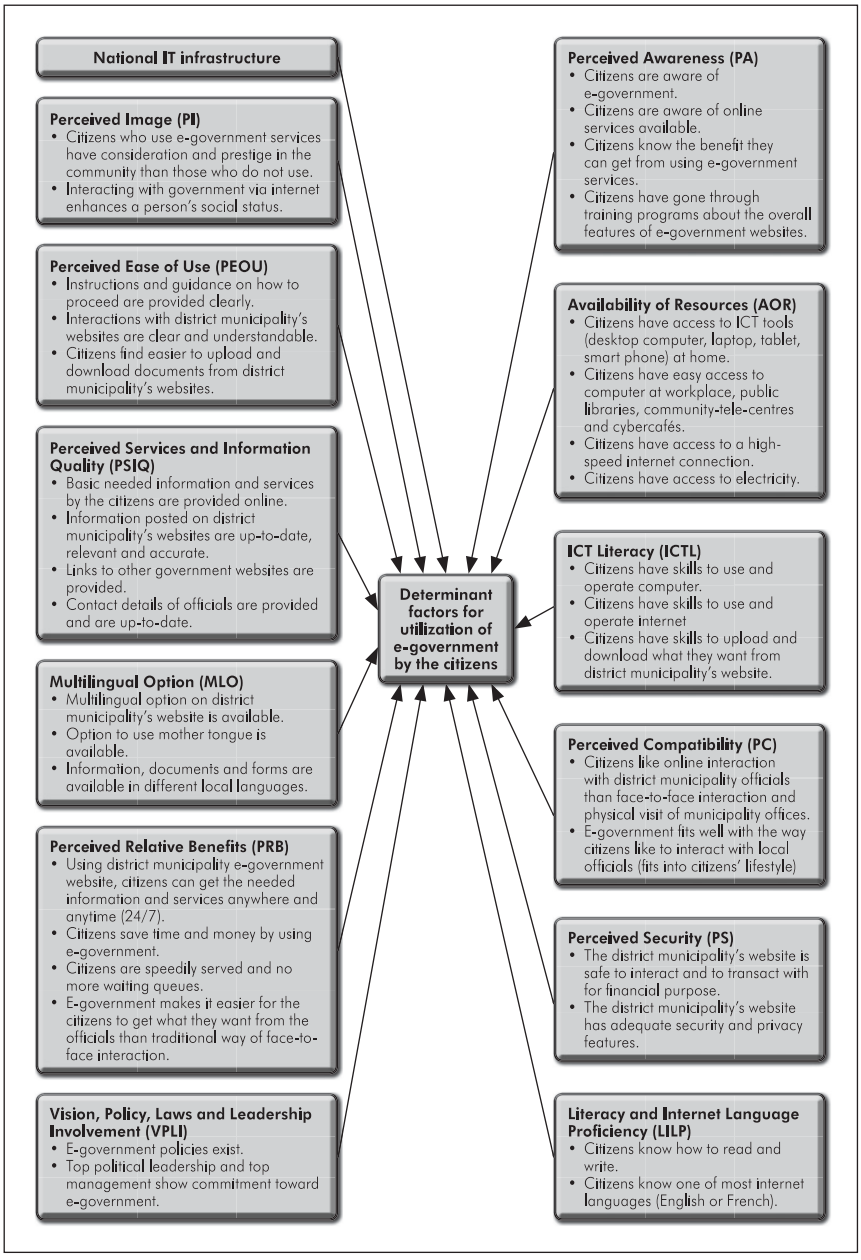
Like Rogers's theory of DoI, UTAUT also provides the factors which can influence the intentions to use an innovation, namely performance expectancy, effort expectancy, social influence and facilitating conditions. The factors in UTAUT are somewhat similar to those described in DoI, but an additional factor, which is "facilitating conditions", is a very important factor that can influence the adoption of e-government by a district municipality and the citizens. 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 and Drew 2012:13). Therefore, the researcher argues that the use of e-government by a district municipality depends among other things on the availability of required resources (funds, ICT devices, ICT infrastructure and 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 ICTs.

## OTHER FACTORS INFLUENCING THE USE OF E-GOVERNMENT SERVICES

The theories and models discussed earlier provided the factors which can promote the use of an innovation in general. However, there are other factors necessary for citizens to adopt e-government services and their absence might impede the use of e-government, namely:

- ***Digital literacy or computer self-efficacy*** - 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;
- ***Availability of resources*** - In the absence of modern ICT devices because of poverty, citizens do not believe that they will receive benefits from using e-government services (Mpehle 2012:111);
- ***Quality of online services*** - Relevant and updated online government information and services are crucial to citizens' use of e-government services (Shareef, Kumar, and Dwivedi 2011:26);
- ***Quality online customer care*** - If citizens and businesses feel that they do not get any customer service in e-government (calls and emails not answered, loss of documents sent online, disclosure of personal information

**Figure 1.1: Research model to assess the utilisation of e-government**




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

to a third party, etc.) they will suspend the use of e-government (Shareef *et al*. 2011:20);

- ***Website design with multilingual option*** - According to Matteson and Jaeger (2009:92), 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;
- ***Trust, security and privacy*** - 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 (Alshawi and Alalwany 2009:201); and
- ***Full involvement and commitment of political leadership*** - Political leadership involvement and commitment affect the success of e-government (Dzidonu 2011:17).

## MODEL TO ASSESS THE UTILISATION OF E-GOVERNMENT BY THE DISTRICT MUNICIPALITY

This research model was drawn from all the discussions presented earlier. According to the model, the adoption and usage of e-government by the district municipality and citizens might be determined by 13 factors presented in Figure1.1 and their absence might impede the utilisation of e-government.

## RESEARCH METHODOLOGY

The research, upon which this article is based, was mainly grounded in the post-positivism or interpretivism paradigm and used a mixed methods approach that assisted the researcher to collect both quantitative and qualitative data. Data used in this article was collected in the four selected district municipalities. Because two categories of respondents were targeted in this analysis, probability and non-probability sampling methods were used, namely purposive sampling (non-probability) and simple random sampling (probability method). Simple random sampling helped to select 400 members of the general public aged 18 years and older. A structured questionnaire covering a number of issues or factors affecting the utilisation of e-government services was used to collect the data and it was translated into Kinyarwanda, the native language spoken in Rwanda, and into Sesotho, the native language spoken by black communities in the Free State. The rating scale ranged from 1=Strongly Agree; 2=Agree;

**Table 2: Educational level of respondents**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| 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 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%** |
| | Bachekor 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%** |

**Source:** (Author's own data)

3=Neither Agree nor Disagree; 4=Disagree; to 5=Strongly Disagree; was used. Field research assistants were used to help collect the data and the respondents in the study were approached at different townships in South Africa and in Rwanda. The data was 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.

Purposive sampling was used to select 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. Therefore, 40 district officials were interviewed; namely 10 interviewees in each district municipality. Personal interviews were carried out in a semi-structured way. The Statistical Package for Social Sciences (SPSS) was used to analyse data collected using the questionnaires.

## FINDINGS AND DISCUSSION

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. 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. Table 2 presents findings relating to the educational level of respondents.

The results in Table 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 or 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. Taking into consideration the educational level of respondents as shown in Table 2 it can be seen that the educational level of the respondents is a big challenge and might affect negatively the use of e-government services. In this regard, Montagnier and Wirthnann (2011quoted in Kumar *et al*. 2007:70) indicate in their research that the probability of an individual using e-government and the

**Table 3: Profession of the respondents**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| Profession of respondents | Self-employed | 18 | 18.0% | 22 | 22% | 51 | 51.0% | 67 | 67% | 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%** |

**Source:** (Author's own data)

internet every day increases 2.4 times in Europe and 3.6 times in the Republic of Korea if they have a university degree and above.

Employment and unemployment may influence the use of the internet and the use e-government services in particular. It is unlikely for an unemployed person to use internet and e-government services as the use of both internet and e-government service requires some money. Table 3 presents findings relating to the profession of the respondents.

The results in Table 3 show that unemployed respondents were predominantly in the Fezile Dabi and Lejweleputswa district municipalities compared to Kicukiro and Kamonyi, while self-employed respondents were predominantly in Kamonyi and Kicukiro. The unemployment rate is low in Rwanda compared to South Africa and this is because Rwanda has an agro-based economy. As more than 80% of Rwandan people are engaged in subsistence farming, the majority (80%) who live from subsistence agriculture are considered as self-employed and contribute a lot to the decrease in the unemployment rate of Rwanda. Overall, unemployment is a big challenge in Rwanda, and in South Africa in particular, and negatively affects access to and use of modern ICT, especially the internet. The researcher argues that those who are engaged in subsistence agriculture and those working in the informal sector (disguised employment) gain a relatively low income and therefore cannot easily access and utilise ICT, especially the internet.

Monthly income may determine access to and use of the internet, and e-government services in particular. According to Kumar, Mukerji and Persaud (2007:69), a high-income household is four times more likely to have access to a computer and the internet than a low-income household. 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). Table 4 presents findings relating to monthly income of the respondents.

The results in Table 4 show that the respondents whose monthly income is less than R1 000 were in Kicukiro and Lejweleputswa rather than Kamonyi and FeziDabi. The explanation can be that Kicukiro and Lejweleputswa are considered urban areas where more unemployment cases are observed. Respondents whose monthly income is R1 000-R3 000 were in Fezile Dabi and Kamonyi rather than Lejweleputswa and Kicukiro, while respondents earning between R12 000 and R15 000 were in Kicukiro and Fezile Dabi. Furthermore, Table 4 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 4 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. With the constant rise in inflation it is difficult for

**Table 4: Monthly income of the respondents**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| Estimated monthly income of respondents | Less than R1 000 | 24 | 24.0% | 13 | 13.0% | 25 | 25.0% | 17 | 17.0% | 79 | 19.8% |
| | R1 000–R3 000 | 44 | 44.0% | 65 | 65.0% | 42 | 42.0% | 51 | 51.0% | 202 | 50.5% |
| | R4 000–R7 000 | 24 | 24.0% | 15 | 15.0% | 18 | 18.0% | 21 | 21.0% | 78 | 19.5% |
| | R8 000–R11 000 | 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 | 0.0% |
| | Total | 100 | 100.0% | 100 | 100.0% | 100 | 100.0% | 100 | 100.0% | 400 | 100.0% |

**Source:** (Author's own data)

average South Africans to make their income cover their monthly expenses and have extra money for the internet. In this regard, Kroukamp (2005:62) argues that 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. Therefore, taking into consideration the monthly income of the majority of the respondents (see Table 4) and their estimated monthly expenses, it can clearly be seen that not much is left for ICT-related expenditure. This state of affairs is likely to affect the use of the internet as the internet is not considered a necessity but a luxury.

Generally, for an individual to use e-government services he or she needs to know how to use a computer and the internet in particular. In addition, he or she 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. Table 5 presents findings relating to the level of English literacy of the respondents.

The results in Table 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, while Kamonyi has the lowest level of English literacy. Overall, the results as shown in Table 5 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 56% of the content on the internet is presented in English (UN 2014: online). 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. It is very unlikely for one to be an internet user if one cannot easily read or write in English, if one is very poor and one is unemployed.

Computer literacy and access to a computer are also factors which may determine use of the internet and therefore use of online services. Computer literacy and access to a computer must go hand in hand, because it makes no sense if computer skills are present but there is no computer access. Table 6 presents findings relating to computer literacy and access to a computer.

The results presented in Table 6 show that a significant number of respondents (41%) do not know anything about a computer and 33% 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 of using a computer. The results in Table 6 on

**Table 5: English literacy level of respondents**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| **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%** |

**Source:** (Author's own data)

**Table 6: Computer literacy and access to a computer**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| **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 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%** |
| | It 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%** |

**Source:** (Author's own data)

**Table 7: Internet literacy and access to the internet**

| | | South Africa | | | | Rwanda | | | | Total frequencies | 3Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| How good is your knowledge of how the 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% |

**Source:** (Author's own data)

access to a 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. Overall, the results in Table 6 show that more than 50% of respondents do not have easy access to a computer and therefore cannot easily use online public information and services.

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' websites. Knowledge of the internet is directly and positively linked to 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 7 presents findings relating to internet literacy and access to the internet by the respondents.

The results in Table 7 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 in Table 7 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.

In addition, the study investigated the tools or devices used to have access to the internet. The research findings show that a number of respondents (37%) have access to the internet via small ordinary mobile phones, 14% utilise smart phones, 13% utilise laptops at the office, while only 3% utilise tablets to access the internet. None of the respondents have a computer with a regular internet connection at home. In addition, the results show that public places such as cyber cafés, Multi-Purpose Community Centres (MPCCs), public libraries and schools are not often frequented by the respondents for internet access. Overall, mobile devices such as mobile phones and smart phones are used for access to the internet. However, they limit users in terms of help, use and access to some e-government services. In this regard, Basu (2004:108) indicates that some websites do not allow mobile or smart phone utilisation; therefore these websites cannot be accessed, or if they are, cannot show all the content.

The utilisation of e-government services depends largely on the level of awareness. It is difficult for an individual to adopt an innovation that he or she is not aware of. However, according to Mpinganjira (2012:104), 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

**Table 8: Level of awareness about e-government**

| | | South Africa | | | | Rwanda | | | | Total frequencies | | Total percentages | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | | | |
| **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 extend 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 | | 23.0% |
| | Agree | 22 | 22.0% | 19 | 19.0% | 24 | 24.0% | 25 | 25.0% | 90 | | | |
| | 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 | | 64.7% |
| | Strongly disaagree | 34 | 34.0% | 31 | 31.0% | 24 | 24.0% | 16 | 16.0% | 105 | | | |
| **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 | | 24.0% |
| | Agree | 13 | 13.0% | 8 | 8.0% | 29 | 29.0% | 24 | 24.0% | 74 | | | |
| | 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 | | 67.4% |
| | Strongly disaagree | 37 | 37.0% | 30 | 30.0% | 22 | 22.0% | 16 | 16.0% | 105 | | | |
| **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 | | 15.8% |
| | Agree | 21 | 21.0% | 9 | 9.0% | 10 | 10.0% | 7 | 7.0% | 47 | | | |
| | 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 | | 75.8% |
| | Strongly disaagree | 31 | 31.0% | 34 | 34.0% | 38 | 38.0% | 33 | 33.0% | 136 | | | |

**Source:** (Author's own data)

awareness of available online services. Lack or low level of awareness about e-government, available online services and steps or procedures involved to have access to them; may limit significantly the use of e-government services. Table 8 presents findings on the level of awareness of the respondents about e-government.

The results in Table 8 show that 26% are very aware and aware of e-government and of the existence of the district municipality's website while 74% are not aware or not informed at all. However, the findings further show that the level of awareness is very limited even for the 26% 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%). Overall, lack or low level of awareness is a common challenge for the respondents in the selected district municipalities and limits the use of e-government services.

From the supply perspective, the utilisation of e-government depends firstly on the level of awareness of e-government (its purpose, advantages and requirements) of the district municipality officials; and secondly on the level of computer and internet literacy of the district municipality officials. A certain level of knowledge and skills on how to manipulate a computer and to utilise the internet is required for local government officials. The lack of, or inadequate skills of municipality officials on how to use both the computer and the internet negatively affect the utilisation of e-government. Table 9 and Table 10 present findings on the level of awareness of e-government, while Table 11 presents findings on the level of computer and internet literacy of the district municipality officials.

Table 9 shows that only 25% are very aware of e-government, 40% fairly aware, while 35% are not aware of e-government. Table 10 shows that only 35% consider e-government very important, while 17% consider e-government not important at all. Overall it can be concluded that awareness of e-government by district officials is a challenge and training in e-government is needed.

The results in Table 11 show that only 30% of interviewees knew very well how to manipulate the computer and the internet, 47% were declared to be well or good, while 23% were not good at all in utilising a 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".*

**Table 9: Level of awareness of e-government of the district municipalities' officials**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| **How aware are you of e-government?** | Very aware | 3 | 30% | 2 | 20% | 4 | 40% | 1 | 10% | 10 | 10.0% |
| | Fairly aware | 4 | 40% | 4 | 40% | 3 | 30% | 5 | 50% | 16 | 50.0% |
| | Not at all | 3 | 30% | 4 | 40% | 3 | 30% | 4 | 40% | 14 | 40.0% |
| | **Total** | 10 | 100.0% | 10 | 100.0% | 10 | 100.0% | 10 | 100.0% | 40 | 100.0% |

**Source:** (Author's own data)

**Table 10: Level of awareness of the role of e-government**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| **How important is the role of e-government?** | Very important | 4 | 40.0% | 3 | 30.0% | 4 | 40.0% | 2 | 20.0% | 14 | 35.0% |
| | Important | 6 | 60.0% | 5 | 50.0% | 4 | 40.0% | 5 | 50.0% | 19 | 47.5% |
| | Not so important | 0 | 0.0% | 2 | 20.0% | 2 | 20.0% | 3 | 30.0% | 7 | 17.5% |
| | **Total** | 10 | 100.0% | 10 | 100.0% | 10 | 100.0% | 10 | 100.0% | 40 | 100.0% |

**Source:** (Author's own data)

**Table 11: Computer and internet literacy level of the district municipalities' officials**

| | | South Africa | | | | Rwanda | | | | Total frequencies | Total percentages |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lejweleputswa | | Fezile Dabi | | Kicukiro | | Kamonyi | | | |
| | | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage | | |
| **How very well can you manipulate a computer and utilise the internet for online service delivery purpose?** | Very well | 3 | 30.0% | 3 | 30.0% | 4 | 40.0% | 2 | 20.0% | **12** | **30.0%** |
| | Well | 5 | 50.0% | 4 | 40.0% | 5 | 50.0% | 5 | 50.0% | **19** | **47.5%** |
| | Not well at all | 2 | 20.0% | 3 | 30.0% | 1 | 10.0% | 3 | 30.0% | **9** | **22.5%** |
| | **Total** | **10** | **100.0%** | **10** | **100.0%** | **10** | **100.0%** | **10** | **100.0%** | **40** | **100.0%** |

**Source:** (Author's own data)

## RECOMMENDATIONS

Based on the factors analysed, namely educational level of respondents, profession of respondents, monthly income of respondents, computer and internet literacy, English literacy and level of awareness of e-government, the district municipality of Kamonyi had higher challenges than Fezile Dabi, Lejweleputswa and Kicukiro.

These findings have wide implications as they can serve as a tool which public policy- or decision-makers can use to set informed policies aimed at ensuring increased utilisation of e-government by municipalities and increased utilisation of online services by the citizens. From the research findings presented in this article, the following recommendations were formulated:

- ***Access to ICT infrastructure*** - access to a computer and internet connection is vital. MPCCs, Internet-cafés, public libraries, schools (primary, secondary and tertiary) equipped with computers connected to high-speed internet connection should be increased, especially in rural areas;
- ***ICT literacy*** - computer and internet self-efficacy is one of the prerequisites necessary for making use of e-government services. People should be provided with training opportunities to ensure that they have adequate skills to use the ICT tools (computer and internet);
- ***Awareness*** - 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 news articles, radio and television is the most effective way as many people can be reached at once. 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;
- ***Increase of GDP per capita or per capita income*** - 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. In addition, entrepreneurship education is recommended;
  Increasing the rate of literacy through access to quality education by all;
- Adult Basic Education (ABE) should be more supported and enforced if possible; and
- Computer and internet literacy is crucial for local government officials.

## CONCLUSION

From the findings of the research on which this article is based, it can be concluded that the selected district municipalities are facing numerous challenges in the utilisation of e-government from both supply side (district municipality) and

demand side (citizens) perspectives. This is evidenced by the low level of education of the respondents whereby more than 75% have completed only primary or high school; 23% were unemployed; and 40% self-employed. Unemployment and disguised employment is the main cause of poverty and the poor cannot use the internet and e-government services. About 70% earn less than R1 000 and between R1 000-R3 000 monthly. With this monthly income it is difficult to cover all necessary expenses and have savings for the internet. 50% did not know the most used internet language which is English. This is a big challenge as more than 56% of internet content is in English. About 50% did not know at all how to manipulate a computer and had no access to a computer. Lack of knowledge and skills to use a computer and the internet was seen as a big challenge. About 75% were not aware of e-government (its purpose and advantages and online services available to them). Finally, some important challenges were also identified from the supply side (municipality); 35% of interviewed municipal officials were not aware of e-government. Only 30% of interviewed municipal officials were very good at manipulating a computer and the internet for online service delivery purposes. Lack of, or inadequate skills of municipal officials in manipulating a computer and the internet, is a very big challenge that needs intervention for the utilisation of e-government.

## NOTE

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