ISSN No:-2456-2165

Determining How Network Infrastructure Affect E-government Adoption at Kinondoni Municipal Council

Authors: Gift Robert and Edwin Kwesigabo
Institute of Accountancy, Arusha, Tanzania

Abstract:- There is sufficient evidence that Information Communication Technology (ICT) is the driving force of economic growth, evidenced by its significant contribution to the growth of developing countries through provision of access to government services *via* electronic government i.e. E-government. Culminate, this leads to higher income and a greater quality of services and life to the citizens. Given its value, governments have thrived to ensure that affordable universal access to ICTs is made possible to all people within a country, regardless of geographical location and/or financial capacity. In terms of e-government services, adoption and usage of the network infrastructure at an affordable price is a crucial requirement for accessing various system resources. Considering ICTs role in universal access, Tanzania has concentrated mainly on the growth of the network infrastructures. Despite the ongoing efforts, the Municipal Council of Kinondoni of Dar es Salaam Region in Tanzania still has a low degree of access to e-government services. This study followed a descriptive approach research design and was carried out by clients and public service customers interested in using E-government services by the Municipality of Kinondoni and employees*via* questionnaire tools for collecting data.About 102people responded to questionnaire that was followed by an exhaustive review on the SPSS software package for statistical analysis and Excel sheets of data collected. The findings show thatmajority of the respondents indicates that network security awareness, network infrastructure vandalism as well as networking skills are main reasons for low adoption of electronic government.

Keywords:- *Network Infrastructure, E-Government, ICTs.*

I. INTRODUCTION

The term "electronic government" was first crafted in the US political literature in 1997 and generally it meant reengineering the government through Information Technology (IT). In 1998, the National Institute of Science in the US implemented the first program of electronic government (Kagaari *et. al*., 2010).The program emphasized on government's use of IT, andaimedat materializing the long-term plans and development of knowledge connections *via* Internet only between government agencies and the IT research community.

Many countries worldwide have adopted and implemented E-government services as a technological process which has special ability for providing convenient access to services and government information for citizens, business partners and suppliers; a process that is cost-effective for all users including industries, federal employees and other stakeholders (Mwangi, 2015).

Information Communication Technology (ICT) has the potential to support socio-economic prosperity in developing countries, mainly through providing access to information and through building communication lines between people and government in accessing services (Muraya, 2015). Technological era brought about by ICTs has revolutionized development of government policies and strategies towards accommodating e-government activities (Muraya, 2015). E-government gained popularity in the world as many Governments strived to improve efficiency and effectiveness in service delivery in response to people's requirement for accurate, reliable and timely information in order to carry out their various activities (Chopra and Rajan, 2016). Despite the potentiality of information on national development, some information can be obtained easily; whereas, other information may require extensive searching and is only accessible from multiple sources. According to Komba and Lwoga (2016), in his study of government information, noted that in public administration, e-government acts as a popular event with the ability of covering all the functions like service delivery, efficiency and effectiveness, interactivity, decentralization, transparency and accountability.

The potential of E-government as a tool for development relies much on three fundamental requirements, namely: infrastructure, human capital, and connectivity(Muraya, 2015).These three basic blocks function closely with the necessary channel for the transmission of information. Research conducted by Adeyemo (2011),identified network infrastructure as a key component for implementing and adoption of E-government services in any organizations as it offers people and businesses a broad range of information through the network infrastructure. Infrastructure is the most important enabling agent in provision of many benefits brought about by ICTs to any organizations. In his study, Adeyemo (2011), further showsthe importance of E-government policy for public modernization market, through the identification and improvement of the organizational structure, contact

methods with people and companies, and business process layers reduction.

Public sector organizations can potentially provide hugequantities of information, and guide consumers towards other sources of information through Internet services as they could switch customers from long queues to web-based connections and reduce physical and human resources strains on short period of time (Komba and Lwoga, 2016).

Governments are playing a key role in the development of ICTs, and are taking part in establishment of enabling environment that promotes reasonable and affordable access to basic telecommunication services for all user (Twizeyimana and Andersson, 2019). The act of ensuring global access to e-government services for all residents reaffirms affordability, regardless of geographic location.

The study conducted by Mohammad *et. al*. (2009) shows that among other factors determining the e-government development are cited as ICT infrastructure development, law and public policy, digital divide, e-literacy, accessibility, trust, privacy, security, transparency, interoperability, records management, permanent availability and preservation, education and marketing, public/private competition/collaboration, workforce issues, cost structures and benchmarking.

II. LITERATURE REVIEW

Many people may not have access to electronic government services. The government's familiar imagination is a slow-moving bureaucracy, reluctant and unable to adapt by using emerging technologies i.e. network infrastructure and new business approaches. In their study, Twizeyimana and Andersson (2019),unveiled that e-government means a lot of different things for a lot of different groups. In this regard, they defined e-government as "utilizing the Internet and the World-Wide-Web for delivering government information and services to citizens. In their research, they concluded that availability of network is one way for having electronic services.

According to Mohammad *et. al.*, (2009),in e-government there is a connection between citizens and government which was not imaginable before. This connectivity has the ability to simplify all process of government, causes internal change, and while reorganizing the government strategy, brings lots of benefits such as cost saving, better communication and effective interaction to both parties, government and users.

Twizeyimana and Andersson (2019)in his study for public value of e-government services case of Rwanda State mentions that E-government was introduced as an Internet-based technology to interact the business of government for delivering convenient services on 24 hours a day basis, within seven days a week, also greater accessibility and high capacity of receiving government services without having face-to-face connection. The study conducted by Kagaari*et al*. (2010)concluded that e-government is the most interesting concept which has come out in public administration and forced managers and leaders of government to pay more attention to government performance and to their relationships with their citizens (Ticu, 2019).

E-government range from "the use of information technology to free movement of information to overcome the physical bounds of traditional paper and physical based systems" to "the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees (Tatyana Rumyantseval, 2016).

E-Government has also been defined as the delivery of improved services to citizens, businesses, and other members of the society by drastically changing the way governments manage information (Kagaari *et. al*., 2010). Full utilization of e-government will bring a lot of benefits to the management philosophy of many governments and is going to bridge the interaction gap between ordinary citizens and the government. It implies, people will take part in decision-making/politics together. Governments are considered complex, mammoth bureaucratic entities with a number of information silos that create barriers to the access of information and make it difficult and frustrating to deliver services. It is for the above reasons for nations to remain competitive in a globalized world, are required to fully utilize e-government, and factors influencing e-government adoption be considered relevant in both the government's internal and external environment (MariéHattingh, 2020)

Many developing nations experience the ill effects of the computerized gap since all-inclusive access to the internet is still far away in numerous nations. According to Ticu (2019),the partition between more extravagant nations and developing ones is huge with high-pay economies having around 416 personal computers (PCs) for every 1000 individuals and low pay economies having just 6 for each 1000 individuals. In light of the United Nations e-government study (2016), the majority of the top 20 world e-government development pioneers are high pay nations. It is however important to take note that some developing nations such as Kazakhstan and Chile have started to make up for lost time with some higher salary nations as they show up in the rising heads in e-government organization list.

In as far as implementing e-government is concerned Canadian government has committed to shaping itself as the government mostly connected to its citizens (Tatyana Rumyantseva1, 2016).Advances in networked information and communication technologies (ICT) such as intranets and the applications that run on them, are often promoted as a solution, able to simultaneously improve effectiveness, reduce red tape, and maintain accountability to Canadians. While e-government infrastructures focus on time and cost savings for public administration and users, it has not seen any business decisions by businesses for keeping e-

government strategy in good order (Reddick and Anthopoulos, 2014).

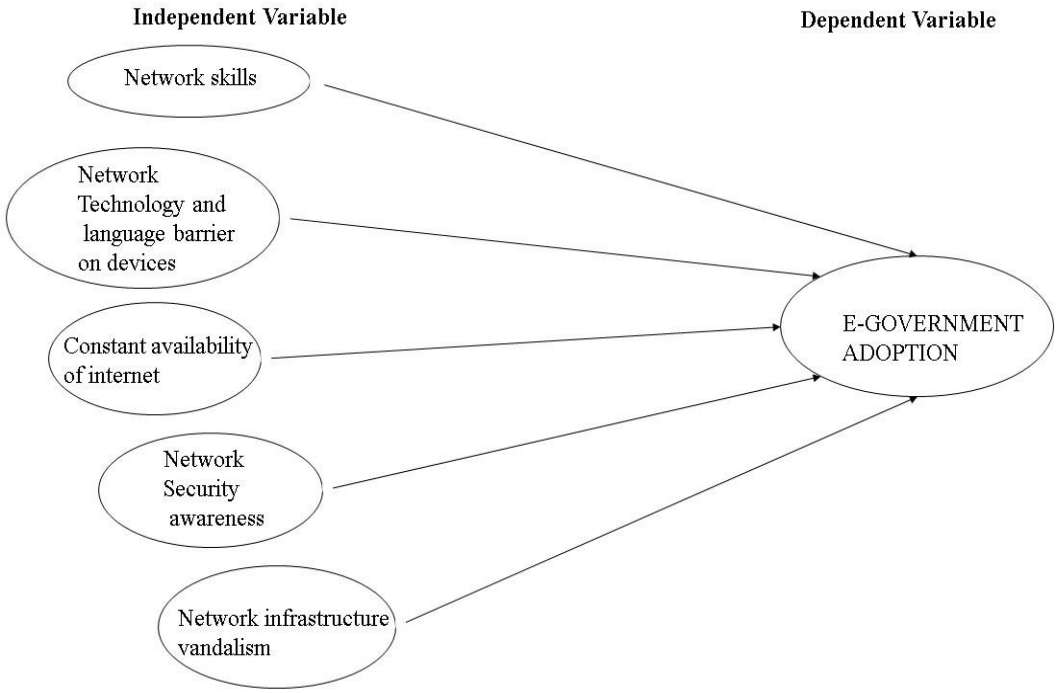
A study carried out by Tripathi and Gupta (2013),shows that most governments in New Zealand and Australia have sought to establish new approaches to the provision of public services using internet and telephony technologies. The use of these innovations to enhance contact with key stakeholder groups to include them in public management choices that shape their lives is one area of enhanced public sector involvement. The adoption of new technologies is, in part, a function of increasing accessibility and affordability. It also reflects a growing recognition of the dynamic and interactive potential of these technologies and their capacity to engage the public (Sang *et. al*., 2010).

Lwoga *et al*., (2010) on hwrstudy notes that Sub Saharan Africa (SSA) faces a lot of challenges when it comes to implementing e-government programs because there is ICT weak infrastructure that is not widely available to all citizens. Expectations of e-Government are the same and also the concept is globally being adopted by countries from all over the world, thus Tanzania is also not left out of this and as per the e-Government strategy 2012, e-Government is expected to help the Tanzania's government to engage and enhance the relationship with its clients through increased and enhanced digital services.

ICT infrastructure is a fundamental test for e-governments implementation, basing on the study conducted by Twizeyimana and Andersson (2019), for empowering, fitting, sharing of information and opening up of new channels for communication just as delivery of services, internetworking is required.Twizeyimana and Andersson (2019)further notes that fundamental IT infrastructure that beholds and avail the advantages of new technologies and communication tools is cardinal. Remote access by cellular telephones and satellite should form part of the very important infrastructural components to benefit all citizens without segregation based on physical location and proximity, as well as and financial capabilities. Absence and/or unreliable supply of power to remote areas hampers access and use of internet (Mwangi, 2015).This is valid for Tanzania as a significant piece of the provincial networks isnot yet associated with the national framework.

III. CONCEPTUAL FRAMEWORK AND CONCEPTUAL MODEL

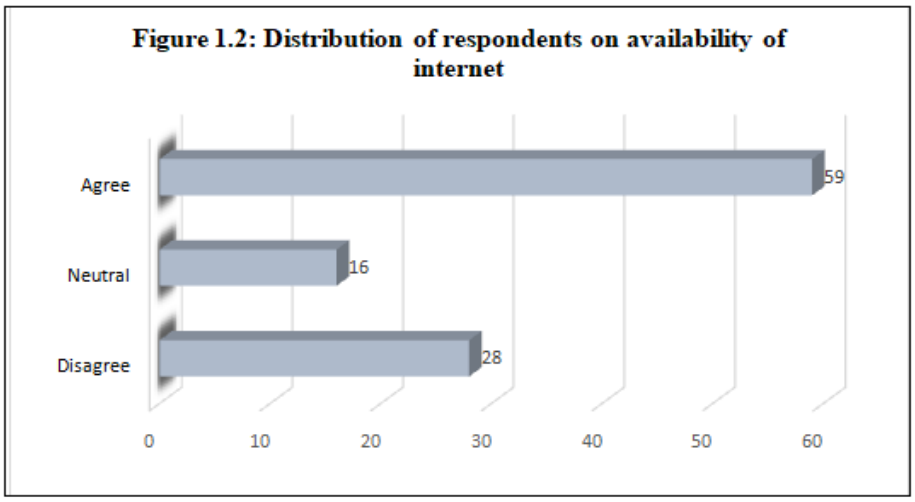
According to Regoniel, (2015), a conceptual framework is written for visual presentation that explains either graphically or in narrative form. Díaz *et al., (*2015) adds that a conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation, Conceptual framework, sometimes is referred to as a theoretical framework, is a type of intermediate theory that attempts to connect to all aspects of inquiry such as problem definition, objectives, literature review, methodology, data collection and analysis. According to the below conceptual framework, the independent variables are internet availability, network security awareness, network infrastructure vandalism, network technology and language as well as network skills while the dependent variables are the effective adoption of e-government in the public sector.



Source: Field data, 2020

IV. PRESENTATION AND DISCUSSION OF THE FINDINGS

4.1 Constant availability of internet

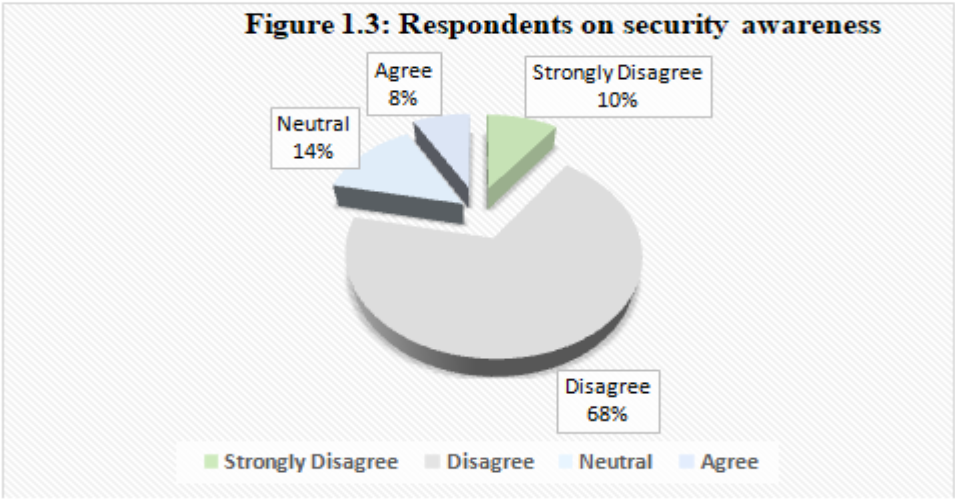


Source: Field data, 2020

The figure above 1.2 shows the distributions of respondents regarding availability of internet in which 59% of all respondents to the questionnaire agree that there is constant availability of internet, 28% of all respondents disagree with the statement while 16% of all respondents remain neutral on the statement. These findings indicate that, Kinondoni Municipal has constant availability of internet services as supported with 59% of the agreeing respondents on the statement. Kinondoni Municipal can therefore be considered to have the least issues for internet availability.

4.2 Network Security awareness

Figure 1.3 below indicates the distribution of respondents on security awareness. The figure shows that 68% of all respondents disagree with the statement regarding security awareness on the internet, 14% of all respondents remain neutral, and 10% strongly disagree with the statement while 8% of all respondents agree with the statement. The results implies that majority of the respondents are not aware on network security in which can be easy for third party to intervene on their network as supported with disagreeing 68% respondentsand 10% strongly disagree with the statement. This means majority of users are not familiar with network security.

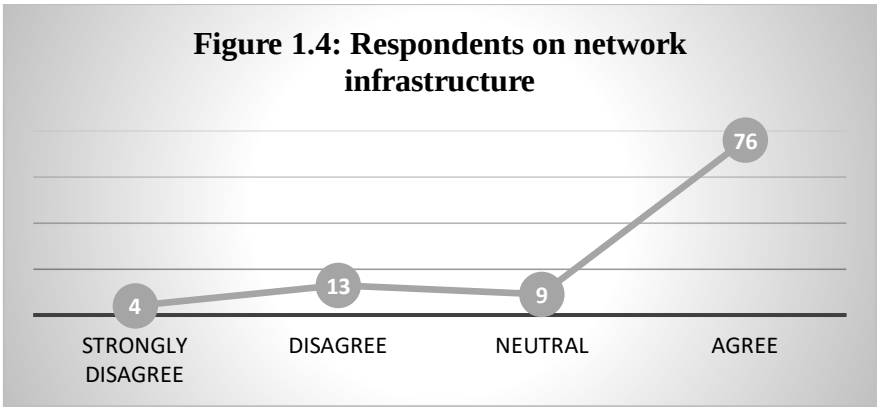


Source: Field data, 2020

4.3 Network infrastructure vandalism

Figure 1.4 below shows distribution of the respondents on network vandalism, with results from the respondents showing that 76% of all the respondents agree with the statement of network infrastructure vandalism, 9% of all the respondents remain neutral on the statement, 13% of all the respondents disagree with the statement while 4% of the respondents strongly disagree with the statement. The results implies that majority of the respondents agree that there is network vandalism which is supported with 76% of all the respondents agree on the statement.

ISSN No:-2456-2165

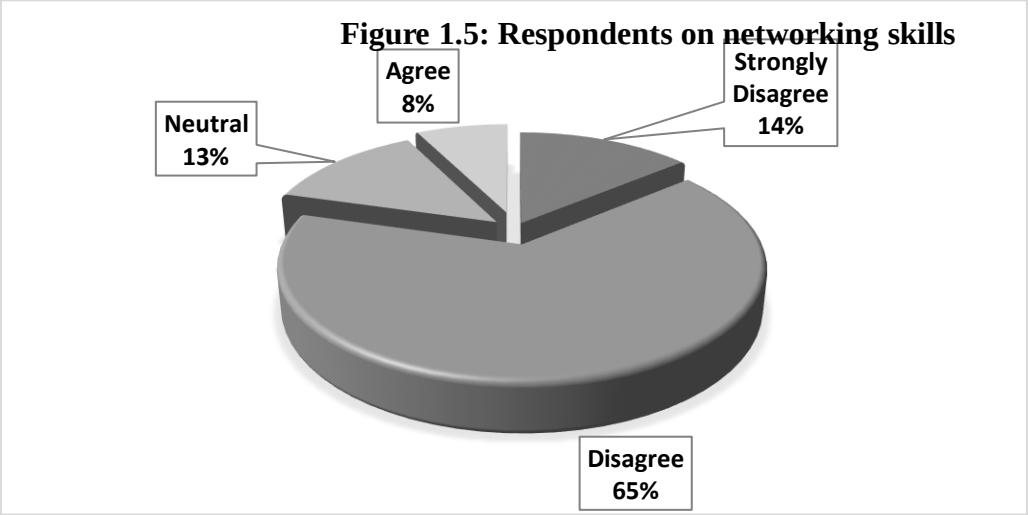


Source: Field Data, 2020

4.4 Networking skills

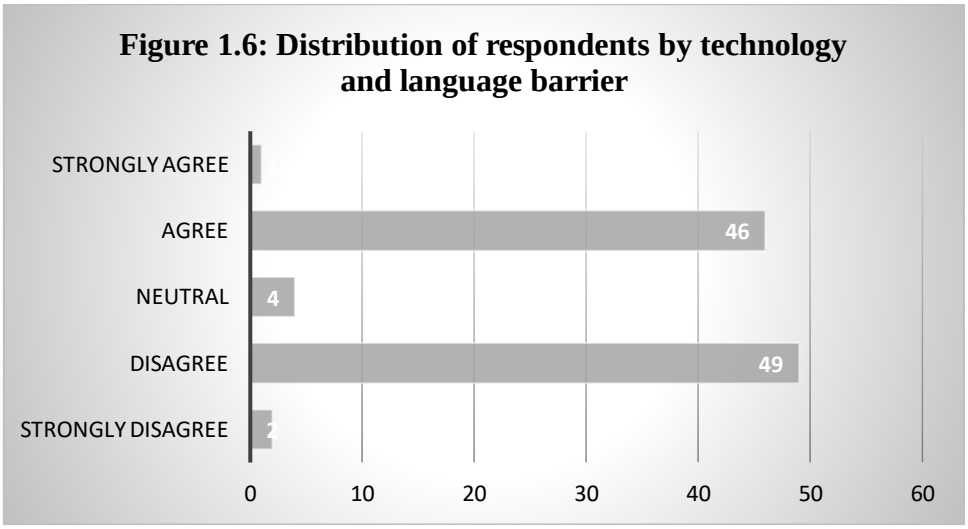
Figure 1.5 below indicates distribution of the respondents on networking skills in which 65% of the respondents disagree with the statement, 14% of the respondents strongly disagree with the statement, and 13% of the respondents remain neutral on the statement while 8% of the respondents agree on the statement.

The results imply that, the majority of the respondents do not have networking skills which supported by 65% of the respondents as figure below demonstrate.



Source: Field Data, 2020

4.5 Network Technology and language barrier on devices



Source: Field data, 2020

Figure 1.6 above indicates the distribution of the respondents regarding technology and language barriers on the network in which 49% of all respondents disagree with the statement, whereas, 46% of all the respondents agree with the statement, 4% of the respondents remain silence regarding the statement, 2% of all the respondents strongly disagree with the statement while 1% of all the respondents strongly agree on the statement.

The results implies that, technology and language used to network infrastructure is not a barrier as the majority of the respondents who agree match with those who disagree with the statement which indicates the technology and language used on network infrastructure is not a huge barrier.

V. CONCLUSIONS AND RECOMMENDATIONS

The findings on how network infrastructure affect the adoption of e-government showed that the availability of internet to Kinondoni Municipal has been good as supported by 59% of the respondents;there is little awareness on security by those n interacting with the network to access electronic government services (68% of respondents disagreed with the statement). Network infrastructure vandalism seems to be high as 76% of the respondents confirmed to the same; whereas, networking skills seem too bad as majority of the respondents disagree on having networking skills; and with regardto networktechnology and language barrier, there was an almost equal agreeing (46%) and disagreeing (49%) by respondents to the statement and can be concluded to be less thorny an issue.

5.1 Recommendations

From the above findings, the recommendations are categorized into three areas.

(i) Security awareness on network usage

The study recommend that, users should be trained on basic networking security as network threats are highly increasing nowadays worldwide. Users should be aware on understanding the purpose of firewall and the use of licensed antivirus for security reasons. This will reinforce security on client primary zone.

(ii) Network Vandalism

Network vandalism is a bit complicated as it needs intensive and complex investigations on all sides of users, vendors, residents near installations, and service providers, Internet service providers should engage the government on the vandalism and its effects to both government and users. Knowledge should be given to all citizens in ensuring network infrastructures are highly maintained and protected.

(iii) Networking skills

Nowadays,technology is changing the way we live and work, as indicated in this study, whereby it showed thatthere was low knowledge of networking skills for e-government stakeholders. Since networking starts with basic logic and connections among others, the study recommended training should be given to the all e-government users. As for technical personnel, computer networkers and security professionals are the ones responsible for smoothly running of computer systems, they should be well versed installations of operating systems, configuring networks, backing up servers, and managing network security. When users have trouble with their systems, these IT professionals are the ones who fix their problems and therefore should be professionally befitting their positions..

REFERENCES

[1]. Adeyemo, A.B., 2011. E-government implementation in Nigeria: An assessment of Nigerias global e-gov ranking. J. Internet Inf. Syst. 2, 11–19.
[2]. Chopra, S., Rajan, P., 2016. Modeling intermediary satisfaction with mandatory adoption of e-government technologies for food distribution. Inf. Technol. Int. Dev. 12, 15.
[3]. Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., Larigauderie, A., Adhikari, J.R., Arico, S., Báldi, A., 2015. The IPBES Conceptual Framework—connecting nature and people. Curr. Opin. Environ. Sustain. 14, 1–16.
[4]. Kagaari, J.R., Munene, J.C., Ntayi, J.M., 2010. Performance management practices, information and communication technology (ICT) adoption and managed performance. Qual. Assur. Educ.
[5]. Komba, M.M., Lwoga, E.T., 2016. Government information seeking behaviour of citizens in selected districts of Tanzania.
[6]. Lwoga, E.T., Ngulube, P., Stilwell, C., 2010. Information needs and information seeking behaviour of small-scale farmers in Tanzania. Innov. J. Appropr. Librariansh. Inf. Work South. Afr. 2010, 82–103.
[7]. Marié Hattingh, 2020 Responsible Design, Implementation and Use of Information and Communication Technology 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, Skukuza, South Africa, April 6–8, 2020, Proceedings, Part I: 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, Skukuza, South Africa, April 6–8, 2020, Proceedings, Part I
[8]. Mohammad, H., Almarabeh, T., Ali, A.A., 2009. E-government in Jordan. Eur. J. Sci. Res. 35, 188–197.
[9]. Muraya, B.M., 2015. Factors affecting successful adoption of e-government in Kenya's Public Sector (PhD Thesis). United States International University-Africa.
[10]. Mwangi, N.M., 2015. e-government adoption by Kenya ministries (PhD Thesis). University of Nairobi.
[11]. Reddick, C., Anthopoulos, L., 2014. Interactions with e-government, new digital media and traditional channel choices: citizen-initiated factors. Transform. Gov. People Process Policy.
[12]. Regoniel, P.A., 2015. Conceptual framework: A step by step guide on how to make one. SimplyEducate Me.
[13]. Sang, S., Lee, J.-D., Lee, J., 2010. E-government adoption in Cambodia: a partial least squares approach. Transform. Gov. People Process Policy.

[14]. Tatyana Rumyantseva1, 2016.E-Government ImplementationJanuary 2016 MATEC Web of Conferences 79:01066
DOI: 10.1051/matecconf/20167901066
[15]. Ticu, D., 2019. E-government elementsin the sectoral public policies: A case study. USV Ann. Econ. Public Adm. 19, 179–183.
[16]. Tripathi, R., Gupta, M.P., 2013. Evolution of E-Government Stage Models in Last One Decade. Public Adm. Reform. Mark. Demand Public Organ. 262.
[17]. Twizeyimana, J.D., Andersson, A., 2019. The public value of E-Government–A literature review. Gov. Inf. Q. 36, 167–178.