

E-Government Development Review in Africa: an Assessment of Democratic Republic of Congo's Global E-Government UN Ranking

Elias Semajeri Ladislas, Businge Phelix Mbabazi, Muwanga Zaake Wycliff, Kareyo Margaret

School of Mathematic and Computing, Kampala International University, Kampala, Uganda

Abstract— with the potential to support Open Government Data in Africa, E-Government (Electronic government) can be defined as the use of information and communication technologies to enable citizens and businesses to interact and conduct business with government. Today more governments across the world are introducing e-government improving service delivery to its citizens. This research aimed to review e-government development in Africa and in Democratic Republic of Congo (DRC) in particular and review DRC's performance in global e-government surveys, review some causes of the low e-service delivery ranking, and recommend solutions to improving future rankings. . The population of the study comprised 72 staff members selected among Managers of ICT and officers at the operational level. Findings show that there's a need to enhance the government web presence to interact with citizens, to invest more in telecommunication infrastructure and to review the implementation framework of e-government in the Democratic Republic of Congo in order to meet the requirements of e-government

Keywords— Democratic Republic of Congo, E-government Development Index, Open Government Data, ranking, Telecommunication Index, Online Social Index

1. INTRODUCTION

Our daily life, personal and professional, has been changed due to the wide spread of information and communication technologies (ICTs), every urban setting, schools, hospitals, library with internet cafes. In North America, 74.2 percent of the population is using internet [1], while developed countries have exploited the power of the Internet to successfully enable public services, developing countries have been comparatively slow in developing successful e-government strategies [1].

The rapid growth of Information and Communication Technology led to transformations in the method of delivering businesses and governments' services to citizens [2]. The advantage of this digital revolution has been taken by private sectors, for now, many governments has recognized the value of information and communication technologies and are switching to the E-government systems which is seen as a fundamental change in the whole structure of the public services to promote transparency, improve public service delivery, remove corruption, and provide better governance. However, some researchers stipulate that there's a low adoption of this systems [3].

The determinants of E-government adoption must be understand from the citizen's point of view to avoid the rejection of e-governance services[4], however some researchers suggest that it difficult to governments to take in consideration the citizen's opinion while implementing e-government [5] [6] [4].

An in-depth multidimensional analysis and understanding of e-government issues from the citizens' perspective is required for the success of the adoption of e-government in order to face the lack of success from a managerial outlook [7]. In the last decade, many governments wanted to capitalize on the tempting potential of revolutionizing the relationship between governments and citizens through emerging web-based technology, therefore e-government has been identified as one of the top priorities for government across the world [2].

1.1 Definition of E-government

E-Government refers to the use by government agencies of information technology tools, such as Wide Area Networks (WANs), the Internet, and mobile computing, that have the ability to transform relations with citizens, businesses, and other arms of government [8].

E-government is defined as the use of electronic medium in governance, in order to facilitate an efficient, speedy and transparent process of disseminating information to the public, and other agencies, and for performing government administration activities [9].

Moon (2005), broadly defined that, e-government includes the use of all information and communication technologies, from fax machines to wireless palm pilots, to facilitate the daily administration of government.

E-government is frequently in comparison to e-Governance, however [11], states stating that e-governance is based on four processes; namely electronic consultation, electronic controllership, electronic engagement and networked societal guidance; whereas, e-government refers to the structure that is responsible for electronic service delivery, electronic workflow, electronic voting and electronic productivity, e-governance refers to the 'outcomes' as a result of 'effects produced' by public administration, whereas, e-government refers to the 'outputs' as a result of 'efforts expended' by the public administration[12]; and mentions that e-government is perceived to be a sub-set of e-governance

Brief Background of E-government in Democratic Republic of Congo (DRC)

The history of E-government can be localized back in the late 1970s in the United States of America during the New Public Management (NPM) reforms [13]. The appropriate application of e-Government allows for higher levels of effectiveness and efficiency in governmental tasks, improvement of processes and procedures, increases the quality of public services, also improves the use of information in the decision-making processes and allows for better communication among different governmental offices [14]. In the DRC, the E-government is traced back in 2012 with the initiative of the World Bank of the participatory budgeting process [8].

The objective was to harness the power of mobile phone technology to increase citizen participation in governance, particularly in budget accountability initiatives. Therefore, it is important to note that between 2000 and 2017, DRC's internet penetration grew from 0% to 3.9% [15]. This signifies a slow but steady penetration growth of internet in DRC which facilitates the government success.

1.2 ICT Development in Democratic Republic of Congo containing the Integrity of the Specifications

The ICT sector in DRC has made huge development, DRC begun to seriously consider developing a National Information and Communication Infrastructure (NICI) plan. In 2004, DRC teamed up with the United Nations Economic Commission for Africa (UNECA) to develop the plan. So far, this plan has achieved insignificant results in terms of e-government and national backbone infrastructure. UNECA acknowledges the failure of this project.

“Due to political situation, the process was stalled for several months, however with the new government swearing in around December 2006, it is expected that the NICI process will restart early 2007,” [16] notes. Evidently, the consequences of the slow implementation of the NICI plan can be felt throughout the entire country [17]. Universal access and provision of broadband network are some of the challenges faced by DRC with impact on ICT dissemination. Since 2009, DRC has adopted its National ICT Policy (NICT) with specific objectives related to broadband infrastructure; accessibility to telecommunication service; increasing the participation of ICT in economic and social development [18].

At this stage, only the broadband infrastructure is in progress. There were no further commitment from the Congolese government in ICT policies with regards to education, health and agriculture. Recently ICT initiatives have been motivated by the government, international organization and private sector such as United Nation Program Development (UNDP), New Partnership for Africa's Development (NEPAD) and Southern African Development Community (SADC) [19]. Main ICT initiatives taken by DRC government and the above partners are [20] [21] [18]:

- 1) 2002: Telecommunications law no. 013/2002 of 16 October 2002 - is the first legislation that governs ICT sector.
- 2) 2006: Regulatory Authority for Telecommunication and Post (ARPTC in French), created in 2003, signed the broadband protocol with NEPAD, thereby including the DRC in the East African Submarine System project (EASSy project).
- 3) 2009: Under the leadership of the Ministry of Posts, Telephones and Telecommunications (MPTT,) DRC has adopted its national ICT policy.
- 4) 2011: DRC Interconnection to the submarine fiber optic cables (WACS Project) at Muanda coastal city.
- 5) 2015: Planning to connect all DRC's cities to national backbone.

1.3 E-government Categories

The objective of e-government is to establish interaction between government and citizens who are the key government customers [2]. Government's customer base is categorized into four key groups namely; government to Government (G2G), Government to Citizens (G2C) and Government to Business (G2B) (Seifert and Chung, 2008). The interaction of government with its key customers is usually through the use of the internet.

A. Government to Citizen (G2C).

Providing facilities to the citizens is the primary goal of e-government, the Government-to-citizen refers to the government services that are accessed by the familiar people. It helps the ordinary people to reduce the time and cost to conduct a transaction. A citizen can have access to the government information and services anytime from anywhere

B. Government to Government (G2G).

The goal of the G2G is to enable government; department and local governments to easily work together to better serve citizens who are the key customer [22] [23]. To achieve this objective, government must make it easier for departments and local authorities

to effectively collaborate and share information and adopt performance measurements practice [24]. This will help decrease response times for jurisdictions and disciplines to respond to emergency incidents and to reduce the time to verify birth and death entitlement information.

C. Government to Business (G2B).

The main objectives of the G2B category are to reduce the cumbersome processes and procedures on government business [25]. This can be made possible by providing one stop access to information and enable digital communication through websites [26]. Business houses should submit their business details once and not multiple times, but through integration of systems within government, government should be able to access the business details through common database sharing platforms.

For example, when government publishes downloadable business requirement processes forms and business regulation rules, there will be no need to engage layers except only when needed.

According to Heeks [27]. it also increases the ability of citizens and businesses to find, view, and comment on business rules and regulations, it will reduce burden on business by enabling online tax filing, reduce the time to fill out export forms and easily locate and store information and reduce time for businesses to file and comply with regulations.

D. Government to Employees (G2E)

The Government-to-Employee is seems to be like an internal G2G sector which aims to bring employees together and improvise knowledge sharing Government to Employee (G2E) facilitates operations of the civil [28].

Similarly, G2E provides online facilities to the employees. Likewise, applying for leave, reviewing salary payment record. And checking the balance of holiday. The G2E sector provides human resource training and development. So, G2E is also the relationship between employees, government institutions, and their management

1.4 The E-government Development Index

The United Nations Department of Economic and Social Affairs (UNDESA) surveys on the adoption of ICT in government for the delivery of essential public services, The Survey delivers the comparative e-government development rankings of all United Nations member states which is called E-government Development Index [29]

In 2012, [30] noted that, mathematically the e-government index (EGDI) is based on the weighted sum of three different indices, namely the online service index (OSI), the telecommunications infrastructure index (TII) and the human capital index (HCI), according to the following equation:

EDGI =

Decision makers can now assess the acceptance and performance of the telecommunication in their respective countries based on EGDI survey according to the three elements.

1.5 Democratic Republic of Congo E-government Ranking

Democratic Republic of Congo (DRC) is ranked 176 in the world according to the e-government development index report of 2018. Table 1. From 2016 to 2018 DRC has improved its ranking by moving 4 places upwards, but in fact its ranking in 2010 was 158 [31], this could be related to many factors.

Table 1: the DRC’s EGDI

COUNTRY NAME	WORLD RANKING IN 2018	EGDI	WORLD RANKING IN 2016	WORLD AVERAGE INDEX
Democratic Republic of Congo	176	0.2612	180	0.5491

1.5.1 Telecommunication Infrastructure Index (TII)

The Telecommunication Infrastructure Index is an arithmetic average which is used to measure five indicators: estimated Internet users per 100 inhabitants; number of main fixed telephone lines per 100 inhabitants; number of mobile subscribers per 100 inhabitants; number of wireless broadband subscriptions per 100 inhabitants; and (v) number of fixed broadband subscriptions per 100 inhabitants [31]. The TII measures the connectivity of Infrastructure to distribute e-service between G2C, G2B, G2G and G2E. DRC’s Telecommunication Index (TII) at 0.0645.

However, according to the ICT Development Index report of 2017, DRC is ranked number 171 in the world ICT development Index [32].

The DRC is amongst three Least Developed Countries which recorded no fixed-telephone subscriptions whatsoever among others the Guinea, Guinea-Bissau and Democratic Republic of Congo, [32]. Mobile cellular subscription per 100 inhabitants is at 43.3 % in 2018 [33]. Internet subscription is 5.9% [15], household with a computer is at 3.1% with a household using internet access at home of 3.2 [32].

Progress has been made in DRC in terms telecommunication infrastructures, but more still needs to be done to close the digital divide especially in rural areas

1.5.2 Online Services Index (OSI)

The Online Services Index component of the E-Government Development Index is a composite indicator measuring the use of ICTs by governments in delivering public services at the national level [31]. The Survey assesses the technical features of country websites as well as e-country policies an development stages with their meaning descriptions, as follows:

Stage 1 - Emerging Information Services: Government websites provide basic information on public policy, governance, laws, regulations, relevant documentation and types of government services provided.

Stage 2 - Enhanced Information Services: Government websites deliver enhanced one-way or simple two-way ecommunication between government and citizen.

Stage 3 - Transactional Services: Government websites engage in two-way communication and electronic transactions with their citizens.

Stage 4 - Connected Services: Government websites are proactive in communicating with their citizens. Governments have moved from a government-centric to a citizen-centric approach, where e-services are targeted to citizens through life cycle events and segmented groups to provide tailor-made services [34]. d strategies that promote the delivering services process by classifying this online service index into four

Table II shows DRC's Online Service Index (OSI) according to the 2018 U.N. e-Government Survey Report.

COUNTRY NAME	WORLD RANKING IN 2018	OSI REGION AVERAGE
Democratic Republic of Congo	0.2083	0.3633

1.5.3 Human Capital Index (HCI)

As one of the critical indicators e-government acceptance, the Human Capital Index consists of four components: adult literacy rate; the combined primary, secondary and tertiary gross enrolment ratio; expected years of schooling; and average years of schooling. In 2018, DRC's human capital index is at 0.5108 little above the regional averaged index of 0.4602 [31].

2. Methodology

Research Strategy and Approach

Choosing an appropriate research method, strategy and approach is one of the most important stages in research, in this study, both quantitative and qualitative. In order to mitigate research biasness, this approach was recommended because mixed approach provides both descriptive and numerical details to the study.

The research were oriented toward 12 government ministries and 4 local authorities in North Kivu province. We used survey questionnaires. 72 participants successfully responded. The participants were selected among Managers of ICT and officers at operational level. To select these participants, the researcher used purposive sampling and the samples were selected at random. .

Therefore, to gain more understanding and gather adequate information about the study, we also used secondary data from past researchers on e-government development in developing countries. We reviewed literature from previous studies more specifically the United Nations E-government Development Survey of 2018.

Microsoft Excel was useful to analyse data collected, then arranged in four categories: online service, telecommunication infrastructure, human capital, and integration system (Implementation framework).

3. Findings

3.1 Online Services Index

The Figure1 shows that only 21% of government Ministries and Local Authorities have some form of web systems which they can use to communicate with their customers or citizens while 79% do not have web presence. This shows that there is a need to undertake necessary steps to adopt ICT and have online presence to communicate with people using the internet.

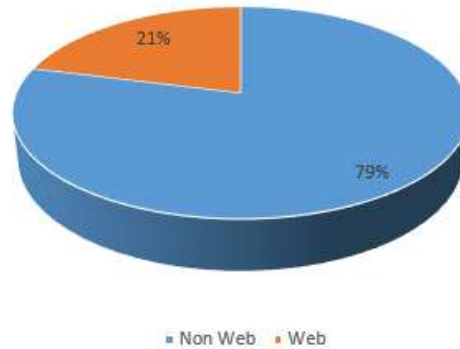


Figure 1: Online Services Index

3.2 Telecommunication infrastructure

The Figure 1 show that 15% of the Telecommunication Infrastructures is adequate to support the distribution and access of electronic services while 85% is inadequate.

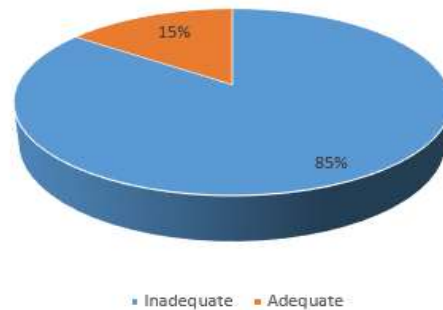


Figure2: Telecommunication Infrastructure

3.3 Human Capital

The Figure 3 shows that 24% of the local skills are available to drive the implementation of e-government while 76% lack specialized skills.

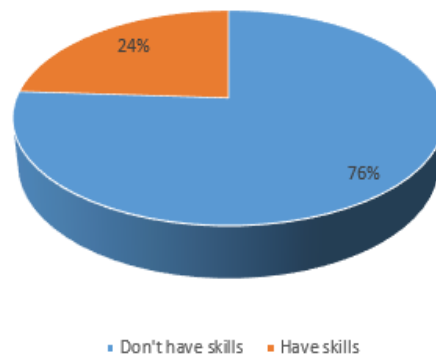
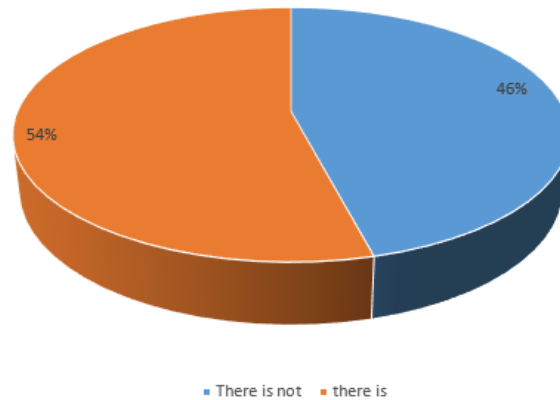


Figure 3: Human Capital

3.4 Implementation Framework

The Figure 4 shows that 54% suggest that there is an implementation framework to guide the deployment of e-government agenda while 46% suggest there is not an implementation framework guiding e-government.



4.0 Conclusion

This research has come out with basic fundamental concepts and theories of e- Government especially on how they contribute to successful implementation of e-Government implementation in developing countries more specifically in Democratic Republic of Congo.

The e-government implementation which is successful requires an enterprise business approach where ICT assets are aligned with the core business model of an organization [13]. When there's a successful e-government implementation then there will be the improvement in the interaction between government and citizens who are the key government customers. E-government supports open government data and makes government information easily accessible for public consumption [13]

5.0 Recommendation

The information and Communication has proved its place in enhancing growing economies like Africa. Sectors such as health, tourism, education and governance totally depend on ICT to effectively operate. Policies on universality need to be reinforced by African governments. It's necessary to encourage more acceptance and use of ICT services in public institutions to effectively deliver services to the people.

Democratic Republic of Congo still has few computerized government services which can be accessed by people online. As it has been seen, there is a more concentrated development of the telecommunication infrastructure in Africa and particularly in Democratic Republic of Congo in densely populated areas for commercial purposes while there's a low development case in rural area. Thus Policies on universal access and services need to be prioritized and reinforced.

The penetration of first level smart phone and use of internet services at household level is still very low in rural areas which explain the ICT Development Index report of 2017 on telecommunication infrastructures in which DRC is ranked number 171 while in 2016 it was ranked 170, day by day it's losing its place and this is a need to investigate why.

Ranked 176 in 2016 while it was ranked 158 in 2010 in the world on the E-government index, the Democratic Republic of Congo has loss values with respect to the E-government development Index, the government should ensure the availability, accessibility and affordability of ICT services for all. The universal access fund collected by regulators should be used to take infrastructure development in rural areas and train people basic ICT skills in order to bridge digital divide and improve the adoption of E-government in Democratic Republic of Congo.

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Authors



Elias Semajeri Ladislas, is a MSc holder in Computer Networks and a Lecturer of IT courses at Université Adventiste de Goma in DRC. He is currently preparing his PhD in Information Systems at School of Mathematics and Computing, Department of Information Technology/ Kampala International University, Uganda.



Dr Phelix Businge is an Information Systems PhD holder from Kampala International University (Uganda). He is currently a Lecturer of IT courses and Computer Science courses at Kampala International University and Muni University (Uganda).



Dr Zake Muwange is a Digital Media in Education PhD holder from University of Greenwich (London). He is currently Associate Professor lecturing IT and Computer Science courses at Kampala International University, Cavendish (Uganda) and University of Greenwich (London).



Dr Kareyo Margaret is an Information Systems PhD holder. She is currently Dean of School Mathematic and Computing at Kampala International University and lecturing IT and Computer Science courses at Kampala International University (Uganda)