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To what extent have ICTs contributed to e-Governance in Uganda?

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Abstract

Information and communication technologies (ICTs) continue to receive unprecedented attention because of their pervasive influence on society. One such sphere of influence is their role in empowering the citizenry in tackling the fundamental facets of governance which, according to the World Bank, include: graft, rule of law, government effectiveness, voice and accountability, political instability and violence, and regulatory burden – a role giving rise to the concept of e-Governance. Uganda has variously attempted to promote e-Governance; huge sums of financial resources and other factor inputs have been sunk in ICT initiatives. The question which arises is, to what extent has the objective (e-Governance) been achieved; what are the gaps and setbacks, if any? Based on literature review, this paper attempts to answer these questions.

Keywords: E-governance, ICTs-Uganda, Electronic services Provision

1. Introduction and Background

UNESCO describes e-Governance as the use by the public sector of ICTs to improve delivery of information and services, encourage participatory decision making among citizens, “and make the government more accountable, transparent and effective”. Thus when citing cases and e-Governance projects in a community, UNESCO categorises them a long three fronts: those championing informing of the citizenry, those spearheading improved service delivery, and those leveraging citizen participation (UNESCO, 2005). From what may be seen as the more technical perspective, e-Governance is categorised into four dimensions (Baguma, 2006):

e-Administration which entails e-Governance relying on networked management information systems in form of wide area networks, local area networks and the web, to spur information exchange and service delivery; e-Citizen in which government and citizens consult one another online to effect service delivery and accountability; e-Services, through which (say) employment information is relayed to the masses, and voting, legislation, and application for visas among others are done electronically; and e-Society where nearly all the above, including e-learning, are fully deployed in a given society.

1.1 Purpose

The purpose of this paper thus is to establish the extent to which the Ugandan citizenry uses ICTs to accesses public services, including determination of the e-Governance dimension that dominates. The paper is motivated by the high premium discourse places on investment in ICTs for e-Governance with potential benefits ranging from efficient public management, empowering citizen to participation in decision making through access to vital or necessary information, enabling government to deliver services to the people more conveniently, among others (UNESCO; Baguma, 2006; Magara, 2009; World Bank and African Development Bank, 2012).

2. Methodology

This paper is based on literature review. The review prioritised scholarly publications. However, owing to the fact that recent publications on the subject with specific reference to Uganda featured less in scholarly journals at the time of writing, other credible sources were used. These included: publications by the United Nations (UN) and its affiliates; World Bank reports and publications and those of its affiliates; and Uganda Government legislations, reports, publications, and policy documents. For the latter sizeable content was sourced from

The New Vision Printing and Publishing Corporation, a Uganda government-owned printing and publishing company. Publications by global research and development organisations, especially those focusing on ICTs and development, such as the International Institute for Communication and Development (IICD), were reviewed, too, among others.

3. Findings

For convenience, the findings are presented on sectoral basis. However, prior to the sector by sector analysis, it was deemed necessary to highlight what literature presents as far as the status of efforts to promote eGovernance in Uganda is concerned. Hence the status of the country's policy and regulatory framework, and the state of infrastructure for eGovernance are presented first.

3.1.1. E-Governance promotion in Uganda: policy and regulatory environment

Government of Uganda (GOU) and her development partners such as DFID (Department for International Development of the United Kingdom) and IICD (International Institute for Communication and Development of the Netherlands), etc, have been channelling a lot of resources in capacity building for e-Governance. Hence a number of policies, laws, and frameworks have been designed to enhance and promote the use of ICT in service delivery; and to regulate it so as to stem abuse and exploitation. Security issues have also been a crucial aspect warranting regulation. Thus Uganda's key notable strategic moves along this line include the following:

First, a fully fledged Ministry of Information and Communications Technology (MoICT) was formed in 2006, to, among others: provide leadership at the strategic level, overall coordination, advocacy, and support on matters of ICT (Ministry of ICT, n.d.). This move was envisioned to be critical in breeding e-Governance.

Secondly, the National Information Technology Authority Uganda (NITA-U) was formed in 2009 courtesy of an Act of Parliament – The National Information Technology Authority, Uganda Act of 2009 (NITA Uganda, 2009) – with “provision of technical guidance for the establishment of e-Governance in the country” as one of the body's core mandates. To strengthen the operations of NITA-U, the National ICT Policy was formulated and approved in 2011 (Uganda, 2011). Other crucial operational policies include: e-Government Policy Framework, Postal Policy, and Analogue to Digital Migration Policy (Tentena, 2012); Telecommunications policy, Rural Communication and Development Policy 2009 (Uganda Communications Commission, 2009), among others.

Besides, a number of laws exist to enable and regulate ICT investments and usage. Some of them are: The Cyber laws (Tentena, 2012) which include the Electronic Transactions Act (Act 8) (Uganda, 2011); The Electronic Signatures Act (Act 7) (Uganda, 2011), and The Computer Misuse Act (Act 2) of 2011 (Uganda, 2011). Others include, The Regulation of Interception of Communications Act 2010, which the President assented to on August 5, 2010 (Vision Reporter, 2011), a law intended to bar users of ICTs from repeatedly abusing those they communicate to, or using Internet and telephones in a manner that threatens national security or the security of individuals. Unfortunately this law has a significant weakness: the fine or penalty of UGSh1.4 million or three year's imprisonment or UGSh200000 daily in case of serious cases, sounds lenient especially where hardcore offenders are involved. The other law which I find to be equally vital if e-governance operations are to run smoothly, is the Access to Information Act 2005 which was gazetted in 2011 (Uganda, 2005). This is because the World Bank and African Development Bank

(2012) stress that ICTs have the potential to transform Africa not because of the computer or the mobile phone but the applications and the information they deliver.

3.1.2 Infrastructural development initiatives for e-Governance

To actualise e-Governance, mega and small infrastructural development projects have been undertaken. For example Government of Uganda (GOU) with support from the Chinese government embarked on laying the National Data Transmission Backbone Infrastructure (a fibre optic cable network). By the end of 2011 (i.e. completion of Phase II), a total of 1,548km of fibre optic cable had been laid in the country (Business Vision, 2011).

At regional level, an e-Governance project named the DistrictNet was implemented in four districts (one from each of the regions) of the country; these include Lira, Mbarara, Mbale, and Kayunga, representing North, West, East and Central regions, respectively (de Jager & Van Reijswoud, 2006; Kazooba, 2009; van Reijswoud & de Jager, 2009; IICD, 2010). In addition, the District Administrative Network programme of the Ministry of Local Government was designed and implemented (IICD, 2010). The latter represents a critical boost to the sector given the fact that earlier studies about ICT usage in the sector especially in Local Governments had revealed a grim picture (e.g. Wasukira & Naigambi, 2002).

And finally but most important, protection and promotion of the mobile phone has taken centre stage. The World Bank and African Development Bank (2012) observe that the mobile phone takes a lead role among the ICTs that have revolutionised Africa; it (mobile phone) is the lead internet, voice, and government services platform – a situation clearly evidenced in Uganda where, by 2012, there were 850,200 mobile internet subscribers compared to 84,558 on fixed internet subscription, thanks to a 99% telephone network coverage and a tele-density of 45% (APC & CIPESA, 2012; Kalemera, Nalwoga, & Wakabi, 2012). In line with this observation, Government of Uganda through the Uganda Communications Commission embarked on protecting this vital e-Governance infrastructure on two fronts: first, compulsory registration of mobile phone SIM cards was initiated to ensure that use of the device is not only controlled but also harnessed. Secondly, the Commission also embarked on streamlining mechanisms to stem the hitherto high prevalence of counterfeit mobile devices on the networks which had been linked to poor quality service.

3.2 SECTORAL ICT DEVELOPMENTS FOR E-GOVERNANCE

Literature reveals that different sectors of the Ugandan economy have registered varying developments in ICTs for e-Governance. This paper reviewed the following sectors: Health, Education, Agriculture, Financial services, and Public Administration.

3.2.1 ICT in financial services

Here, government parastatals, banks, and other financial institutions have tried to do what they can to embrace ICTs in public service delivery. The following deserve attention:

3.2.1.1 Uganda Revenue Authority's eTAX system

Tax management and administration is a pervasive activity which affects every citizen, businessman or woman, the corporate world, government, among others. Hence any effort or innovation that simplifies this activity by bringing services closer to stakeholders is pivotal in society and may take centre stage. It is against this background and by all standards that URA's eTAX system represents one of greatest eGovernance breakthroughs Uganda has registered. Kajubi Moses, the then URA Commissioner for Domestic Taxes, reports that in

July 2011 eTAX had oriented the Authority's tax administration into the 21st century, characterized by ever more demanding service expectations (The CEO Magazine, 2011).

eTAX is a web portal which permits Uganda Revenue Authority (URA) to provide taxation and related services to clients locally and internationally. Many processes and services hitherto handled physically at the parastatal's premises are now done online from anywhere in the world. Such services include: registration for taxes, filling in tax returns, registration for payments, validation of motor vehicle details, registration of new motor vehicles, transfer of motor vehicle ownership, among others (Uganda Revenue Authority, n.d). For each of these, users just need to visit URA's web portal (<http://ura.go.ug/>), read the guidelines (for new users), complete the appropriate forms online and submit the form online. Some of the services require login while others (i.e. the majority) don't.

To extend the corporation's interventions aimed at simplifying tax administration and management, Herbert Ssemugo of URA's Public and Corporate Affairs division reports that they rolled out the e-Stamp services to all Domestic Taxes offices countrywide (Ssemugo, 2013). Hence electronic stamp certificates can now be obtained on payment of stamp duty so that documents are legalised.

The system has registered enormous payoffs for URA and government in general. For instance The CEO Magazine (2011) reports that by 2011, URA had noted many multinationals that were filing returns and other tax transactions from their parent countries hence registering over 1000 users of the platform from cities and locations around the globe. The firm is now able to provide customised responses to taxpayers based on the latter's observed nature of management of tax affairs. Conversely, now that taxpayers can assess themselves with minimum intervention (if any) from URA, there is time saving for both parties, and URA has the liberty to channel manpower and other resources to alternative activities or even downsize labour, and drop some functions hitherto manned by people. For the e-Stamp service, Stamp Duty payers no longer travel to Kampala. This saves their time and money, and increases compliance.

3.2.1.2 National Social Security Fund's e-Statements

Prior to the integration of ICTs in managing workers' savings, it was difficult for the savers to monitor the trend of their deposits on a regular basis. However, for close to three years now, a social security contributor has few things to do online once and they will be able to start getting their statement online any time, anywhere henceforth. According to National Social Security Fund (NSSF) web portal (<http://www.nssfug.org/17/Information>), the client sends his or her email to customerservice@nssfug.org requesting for a password. The following details are also required when sending one's email: the 13-digit NSSF Number, the client's full names (used during registration with NSSF), date of birth, father's full names, mother's full names, the saver's employer (at the time of registration with NSSF).

On receiving the above details, NSSF automated system sends a password to the saver's submitted email address within 24 hours. The customer then opens the NSSF website (www.nssfug.org), enters their 13-digit NSSF number and the password on the e-statement feature on the left-hand side of the screen / web page. On clicking log in, the customer views his/her e-statement which can also be printed. Hence clients are able to monitor their savings online whenever they want. This appears to be a key contributing factor to the recent increase in compliance rate by employers in remitting workers' savings to the fund.

3.2.1.3 e-Water at National Water and Sewerage Corporation

Billing consumers for domestic utilities (especially water and electricity) had remained a discontentment issue among consumers for decades; utility company staff would come to the premises (if at all they did so), take meter readings, only to bring bills several weeks later and most often with contentious figures/sums of money stated largely due to reliance on estimates instead of actual meter readings. As a result, non-compliance, default, constant disconnection, hatred, and illegal connections or consumption became commonplace.

However, when the corporation (National Water and Sewerage Corporation) deployed the eWater ICT solution in the billing and collection of user fees about four years ago, all hitherto woes were thwarted. This development made the company win the eGovernance category of the 2nd edition of the 2012 Annual Communications Innovation Awards (ACIA), for using ICT in the billing and payment transactions with the firm's customers (e-Water). The annual event, organised by the Uganda Communications Commission (UCC) is geared towards recognising excellence in ICT innovations (Nkwasiabwe, 2012).

e-Water is a real time bill payment system adopted by National Water and Sewerage Corporation, aimed at eliminating delays in updating customer accounts plus saving customers from both of physically going to payment centres to queue so as to pay their bills. NWSC officials simply go to the water consumer's premises with handheld gadgets, take customers' water meter readings and print out the bills from the gadgets on spot. On receiving the bill, the customer has the choice to pay using mobile money Pay Bill service (now operational on MTN, Warid, Airtel, and UTL's Mango mobile telecommunication platforms), or to go to the nearest bank which has NWSC e-Water interface to pay, in which case a short message service (SMS) alert will be delivered to the paying customer's mobile handset when the transaction is done (National Water and Sewerage Corporation, 2013). Most of the partnering banks have a large branch network covering the entire country hence making e-Water a typical e-Governance product; hence service delivery is brought nearer to the people through ICTs.

Since the on-spot bill shows the date and time of taking the meter reading and billing, and previous payments made, among others; consumer confidence is guaranteed. For instance, by getting the outstanding bill without the NWSC official first taking away the readings and coming back later; and the customer having the opportunity to corroborate the particulars on the printed bill with the water meter reading on that very day, there is nothing else required to win the hearts and minds of such water consumers. Logically I can conclude that this wonder ICT initiative, which illustrate a typical e-Governance service, significantly accounts for NWSC's current rating as (according to Baietti, Kingdom, & van Ginneken, 2006; Public Utility Research Center, Warrington College of Business Administration, University of Florida, 2011) one of the best performing utilities in Africa.

3.2.1.4 Umeme TouchPay and eBill

Umeme Limited, a utility company now listed on the Uganda Stock Exchange, with the monopoly of distributing electric power in Uganda, had for long had challenges in collecting revenue from power consumers. Even when the company partnered with many commercial banks as a way of decentralising or spreading points of revenue collection, the then lack of real-time bank reconciliations made consumers who had paid to be disconnected for non-

payment (Umeme, 2012). This severed customer resentment and public relations; hence power theft and increased default increased. The company had therefore become a perpetually loss making entity. However, with adoption of ICTs in billing and revenue collection, a turnaround was registered. The company launched a bill payments service on July 11, 2012, codenamed “Touchpay Solutions”. The ICT solution permits customers to use mobile money service to clear their bills, and effects real-time bank reconciliation. Initially payments were possible through only two mobile telecom companies: MTN Uganda and Airtel Uganda; and nine partner banks: Bank of Africa, Barclays, Centenary, Citibank, Stanbic, Crane, DFCU, Post Bank, and Standard Chartered Bank (Umeme, 2012). However, other telecom companies (Warid Uganda, Orange Uganda, and UTL) as well as banks (Housing Finance Bank among others) were brought on board. Therefore, customers, whether from upcountry or in urban areas where Umeme offices or branches exist, are able to pay instantly from the comfort of their homes thereby improving compliance.

The major observation here is that the above revolutions in electronic payments and financial services are rooted in the emergence and rapid growth of mobile telephony and subsequent introduction of mobile money service; and of recent, Internet Banking in Uganda. Wray (2008) stresses the pivotal role mobile banking has played in revolutionalising the financial services in Africa:

“...to people in the developing world, the arrival of mobile banking - or m-banking - is potentially revolutionary. If money is an economy's lifeblood, improving its circulation plays a critical role. Many Africans living in rural areas, for instance, rely on money sent home by members of their family who work in towns and cities. But getting that cash to a village that could be hundreds of miles away is a tricky business...even to those with bank accounts because of the dearth of bank branches in rural areas...But the dramatic growth in mobile phone use in Africa...is paving the way for a new set of services that turn the humble handset into a banking tool with the potential to transform Africa's economy” (Wray, 2008).

Ssonko (n.d) of Bank of Uganda’s Research Department; and Dermish, Kneiding, Leishman, and Mas (2012) observe that the growth of mobile money services has promoted financial inclusion which is crucial in achieving sustainable development. Financial inclusion emanates from the fact that there has been a proliferation of mobile phones amongst low income earners coupled with the ubiquitous nature of mobile phone networks, and associated benefits such as (McLeod, 2013) low charges compared to deposit taking institutions, and reduced risk. This, according to Charles Abuka, Director for financial stability at the Bank of Uganda, contributed to an increase in the number of mobile money transactions from 87.5 million in 2011 to 242 million at the end of 2012, reflecting a growth in the value of the transactions from Ush3.8 trillion (\$1.46 billion) to Ush11.7 trillion (\$4.5 billion) (McLeod, 2013). This eGovernance development has also led to a 36.7% liquidity variance in Ugandan Commercial Banks (Kamukama & Tumwiine, 2012).

3.2.2 ICTs in public administration and local governance

This is supposed to be the core of eGovernance. Unfortunately, I can best describe it as a limping sector as far as eGovernance in Uganda is concerned. However, there are some projects that have taken shape. The following feature prominently in literature:

3.2.2.1 Electronic fund transfer (EFT)

The use of EFT marked the implementation of ICTs in the banking industry (Bank of Uganda, 2013). Bank of Uganda (BOU) implemented this payment instrument in August 2003 as a means of payment for both credit transfers and direct debits. Since then it has established itself as a speedy, safe, and convenient means of payment, hence the most widely used system for funds transfer between banks and corporate clients and vice versa, government and corporations, central government and local governments, etc. Hence it has eased service delivery. Since 2007, many schools adopted EFT for payment of school fees or tuition (Bank of Uganda, 2013). Its popularity gained prominence when Government instituted a regulation in 2007 requiring that a payment of UGX20,000,000 (twenty million) and above to its suppliers or employees must be routed through EFT.

3.2.2.2 The Integrated Financial Management System (IFMS)

The Ugandan Government adopted the IFMS in order to improve efficiency in budget preparation, execution, and financial reporting (Semakula & Muwanga, 2012). The authors report that the system is now operational across 22 ministries, 25 central government agencies, and eight (08) local governments. There are plans of extending it to another six local governments as the first step in the planned coverage of all local governments in the long run (when enabling ICTs are rolled out throughout the country). The key payoffs of this eGovernance tool include: greater expenditure control and discipline in the management of government budgets arising from improved oversight and enforcement of internal controls, shorter payments processing times, improved account reconciliation, and more accurate and reliable financial reporting (Semakula & Muwanga, 2012).

3.2.2.3 Online availability of information for public administration and governance

Taking Baguma's (2006) classification of eGovernance, this falls under eAdministration. In the editorial article titled "challenging times for public administration" in the Public Administration journal, the editor crucially comments that problems that public administrators confront nowadays are increasingly trans-boundary in nature since they do not recognize geographic or policy borders. Hence they demand a trans-boundary response (Boin, 2013). Citizenry information requirements fit in this dimension. Ugandans, whether in the Diaspora or in the country, foreign nationals or governments, are constantly in need of accessing information on government services. To respond adequately to this trans-boundary demand, provision of citizenry services and outreach over the Internet is imperative.

Luckily, the country has not completely faltered on this logical direction; all the country's 24 ministries and 16 parastatals have operational websites (Ministry of Information and Communications Technology, 2013). The websites provide non-classified government information online hence it is accessible from anywhere and anytime. Through the many websites, a number of services are offered to the public away from the Ministries and parastatals' premises to enable government implement public policy and governance. The most notable online services that have gradually taken shape so far are: Registration of current and prospective suppliers of goods and services to public organisations – done online through the Public Procurement and Disposal of Public Assets Authority (PPDA) website; reporting of suspected corruption, misuse, and abuse of office by public officials to the Inspector General of Government (IGG); immigration and citizenship issues including

how to secure passports and work permits, how to renew passports or replace damaged or lost ones (plus obtaining forms to use for these services), security issues, electioneering, education and scholarship, tourism and travel information, among others.

Two new developments occurred in the eGovernance arena in 2013; first, a modern Land Information System (LIS) that had been undergoing design and development was declared ready for use by the public. Developed by the Private Sector Foundation Uganda (PSFU) in collaboration with the Ministry of Lands, Housing and Urban Development with support from the World Bank, the computer based LIS permits users to search and verify land registration records. When fully operational, it is expected to reduce corruption that had been associated with records checking and verification, increase security in land registration and deliver services closer to the people (Private Sector Foundation Uganda, 2013). Therefore, besides solving the inefficiencies which had bedevilled land administration in Uganda, the Ugandan public will no longer travel long distances and queue at the land registry offices for every service they need; online service delivery will solve most of the issues.

The second development is that in July 2013, Government of Uganda started issuing national identity cards to registered Ugandans. The inaugural period witnessed a lot of crowding and long queues at issuance centres that are manned by staff from the Ministry of Internal Affairs. Annoyingly, many people turned up and queued hoping to get their cards only to be told that theirs were not ready or had errors hence they could not receive them. Handy as ICTs are always in mitigating challenges, the Ministry introduced an SMS platform for those who registered with the Electoral Commission in 2010 and thereafter, seeking to know the status of their national identity cards (Sekanjako & Agaba, 2013). To use the service, the desirous individual types 'Uganda' followed by a space, followed by his or her Electoral Commission Registration Number; and sends the SMS to 8888 at a cost of UGSh220 (about US\$0.08). The sender receives a feedback telling him or her the status of the identity card.

3.2.3 eGovernance in the health sector

The use of ICTs in healthcare provision has witnessed the emergence of many innovations and terminologies in the developing world, the most popular one being mHealth and eHealth. Of these, mHealth is more popular in Uganda. In its simplest form mHealth means *mobile for health* (Kelly & Minges, 2012); broadly, it is the "...use of mobile technology to address healthcare challenges such as access, quality, affordability, matching of resources, and behavioural norms [via exchange of information]" (Qiang et al. 2012 as cited in Friederici, Hullin, & Yamamichi, 2012). The innovation is lauded for its pivotal role in preventative and curative care although identification, selection, and integration of the right m-Health tools remain a challenge (IICD Annual Report, 2012). Some of the ongoing and planned mHealth and web applications in healthcare delivery in Uganda are highlighted below.

3.2.3.1 mTrac (Mobile Tracking)

This is a mobile phone based innovation launched by Uganda's Ministry of Health on 9th December 2011 in Jinja Municipality near the source of River Nile. The government ICT initiative consists of a toll free mTrac SMS (short message service) Hotline (8200) that is used by any community member to report health service-related issues such as stock-outs of

essential drugs (especially malaria drugs) in hospitals directly to Ministry of Health officials (Atef, n.d; New Vision, 2012). The innovation had registered success especially in Health Centre IVs. For instance Yusuf Atef (*ibid*) of UNICEF Uganda reports that mTrac had standardised drug management and operations because “replenishment of depleted drug stocks is only a click away”. An example is Mukono Health Centre IV where hospital management acknowledged that they no longer had to spend money on fuel to drive to National Medical Stores to just inquire about drugs; an SMS to 8200 triggers an immediate response, culminating in delivery of the required medicines to the healthy facility, hence greatly improving the tracking and monitoring of especially malaria death rates.

Research also indicates that the integration of mobile phone usage in family planning programmes registered good results. For instance IICD Annual Report (2012) singles out increased uptake of family planning methods in Busoga Region of Uganda thanks to Jinja Diocese Village Health Teams’ use of text messages to communicate and sensitize current and prospective mothers.

3.2.3.2 Registration of births and deaths

In 2011, UNICEF and Uganda Telecom in partnership with Mulago Hospital and the Uganda Registration Services Bureau (URSB) developed and launched a digital platform, the first of its kind in Sub-Saharan Africa (Makuma, 2011). Launched under the flagship title of Mobile VRS Project, the system uses a web application to capture birth and death records that take place in hospitals and within communities (Uganda Registration Services Bureau, 2013). It was first tested in the districts of Kaberamaido, Kiboga, and Kyenjojo in Eastern, Central, and Western Uganda, respectively; Mulago Hospital, Uganda’s largest and main referral hospital also participated in the pilot tests. The overall aim of the initiative was to increase the percentage of children below five years of age whose births are registered and birth certificates issued nationwide from 21% to 80% by end of 2014. On the other hand, the specific objectives of the ICT innovation were to: improve management of information related to birth and death registration; increase the number of birth and death registrations recorded; strengthen the accuracy of birth and death registration documents, reduce the lead time in the issuance of such documents, and to improve the management and use of national data (URSB, 2013).

The results so far indicate that the innovation has recorded 1,168,717 births records of which 66% are child births; the Uganda Registration Services Bureau has been empowered to monitor progress of timely registration in terms of time and location, and transmission of birth records in real-time from districts and hard-to-reach areas to the organisation’s central databases (URSB, 2013). Unfortunately, lack of knowledge and skills, coupled with general illiteracy, present a serious challenge to eHealth and mHealth in Uganda (Friederici, Hullin, & Yamamichi, 2012).

3.2.4 ICTs in the Agricultural Sector

There is documented evidence that institutional frameworks like the National Agricultural Advisory Services (NAADS) designed to offer agricultural extension services to farmers are performing dismally. For example Makerere University Economic Policy Research Centre (2011) indicates that by 2011, only 13 percent of farmers in Uganda were accessing NAADS services. This implies that adoption of ICTs in the operations of the sector would be a plausible alternative, given ICTs’ potential in circumventing bureaucratic and corruption

traps. Unfortunately, literature paints a grim picture, too, with only two or three initiatives in the sector meriting presentation here:

The first is the use of *adapted call centres* to access agricultural information: Miller, Saroja, and Linder (2013) report that in some parts of rural Uganda, farmers use Question Box, a simple technology which relies on phone boxes. Started in 2009, the initiative entails a trained operator with internet access taking calls and answering people's questions (in the local language). Hence people in remote locations of the country that would otherwise lack access to required agricultural information especially because of language barriers, are able to do so.

The other innovation is the use of *Sokopepe*, an online commodity marketing platform created by an NGO called Arid Lands Information Network (ALIN). The initiative has been in use since 2010 in Uganda, Kenya, and Tanzania (FAO, 2013). Through SMS and WAP, and email and the Web on their mobile phones, farmers are able to bypass middlemen in the marketing chain. This results in farmers getting the highest bid price besides knowledge sharing. Since access to the service is pegged to membership to a local *maarifa* (knowledge) centre (such as Lukwanga Community Knowledge Centre in Wakiso district) which is equipped with computers that are connected to the internet, farmers also access weather and climatic change information. Knowledge sharing at the centre is augmented by a dedicated blog hosted at lukwangamaarifa.blogspot.com.

There have also been attempts by Community Knowledge Workers (CKWs) in Uganda (under the stewardship of the Grameen Foundation) to interface between content producers and smallholder farmer groups using mobile phones. The CKWs conduct mobile based surveys of their communities and also relay feedback via the same medium. The information addresses issues related to: land preparation based on prevailing weather forecast, pests and diseases (including sending pictures of infested animals/crops for diagnosis and advice), and storage facilities available (World Bank and African Development Bank, 2012).

Finally, farmers who can afford smart phones thanks to the declining cost of obtaining one can download mobile Apps which forecast whether and climatic conditions as opposed to relying on print and electronic broadcasting media houses. The latter are predominantly a preserve of urban centres and require electric power connectivity yet agriculture is a rural based activity. Smart phones also feature essential mapping Apps which are crucial to non-peasant farmers.

3.2.4 ICTs in the Education Sector

Modest breakthroughs have so far been registered in using ICTs to bring services closer to the citizenry in this sector, which paints a grim picture for the country. In a report published by the World Bank, it is indicated that delivery of quality education to citizens is critical if Africa is to participate meaningfully in the knowledge society (Souter, Adam, Butcher, Sibthorpe, & Tsubira, 2013). Sadly, the same authors (pp. 74-75) reveal that by 2012, Uganda lacked a duly approved policy and strategy for ICT in education, a situation that was most likely responsible for the limited focus of the country's predominantly donor-driven ICT in Education initiatives. For instance there was lack of coordinated effort to address access and connectivity for schools: "The overwhelming majority of schools in Uganda – primary and secondary – lack access to both the internet and power" (Souter, Adam, Butcher, Sibthorpe, & Tsubira, 2013, p. 75).

On the other hand, however, there are some ICT innovations in the sector, which have created an impact already. The popular pioneering initiatives have predominantly targeted leveraging student related services such as access to national examination results when released by the Uganda National Examinations Board (UNEB), applying for private admission to public universities and subsequent feedback from this process when shortlists are out. These popular breakthroughs are highlighted below.

3.2.4.1 Access to national examination registration and results information

This Ministry of Education and Sports ICT innovation which was introduced in December 2009 under UNEB stewardship is so far the most popular and successful eGovernance innovation in the sector. The innovation is a response to nationwide loathed phenomenon where, for a over a decade, the release of national examinations by UNEB; i.e. Primary Leaving, O' Level, or A' Level examination results triggered a period of stress and suffering: head teachers travelling long distances from upcountry and struggling in long queues at the Board's Kampala headquarters, for prompt delivery of the released results to the beneficiaries; students and parents spending money and time to go to their respective schools followed by struggling at crowded school notice-boards to view results. Additionally, due to hitherto absence of an instant mechanism for students to check and confirm whether their head-teachers registered them with UNEB, some head-teachers used to collect money for UNEB registration without remitting such money to the examining body. Hence students would only learn that they were not registered at the time of sitting the national examinations hence being barred from sitting.

All that is history thanks to UNEB's "Access to national examination registration and results information mobile phone SMS" innovation. The service requires a user to simply use a mobile phone to send a text message (SMS) containing a prescribed key word followed by the user's UNEB index number, to code number 6600; the SMS costs only UGX500 (about US\$0.2). The student's individual examination results or feedback on registration status is delivered to the mobile phone instantly (Uganda National Examinations Board, 2010) or at least after a brief interval if the system is overwhelmed by requests.

Makerere University adopted the same method about a year or two ago; prospective students who applied to the institution for admission on private sponsorship use the method to find out if they were admitted or not when the shortlist is out. In addition, the country's oldest public university also boasts of many functioning automated integrated information management systems. These enable the students to liaise with academic registrar, financial, and other departments as wells as the university's bankers when they (students) are on or off campus. These have significantly simplified the general public and students' dealings with the institution. For example queuing for manual receipts, lead times in securing transcripts, accessing results by continuing students, among others have been leveraged.

3.2.4.2 Online application for admission to public universities

This is notable radical move towards ICT-based service delivery to the public in the education sector which occurred at Kyambogo University in May 2013. Originally or since the university's inception in 2001, it had been relying on paper based application procedures when admitting the tens of thousands of students on private sponsorship, a process which had perpetuated forgery of entry marks and admission letters, and delay in selection and short-listing of qualifying students, among others. All this was abandoned in May 2013: all Direct Entry (O and A level) applicants for the university's August 2013 in-take had to complete and submit their applications solely online via the university's website; the URL of the

university's online application system is <https://admissions.kyu.ac.ug>. The university did not entertain paper application forms at all, not even the download-print-and-fill forms.

To use the system, which is a component of the e-campus system being developed to automate most of the University's services to students and the general public, the applicant uses his/her email address as the username. On reaching the final step of completing the online application form and clicking SUBMIT, the system generates a payment slip bearing the applicant's particulars, the application fee, and, most important, a barcode. The applicant prints the payment slip and uses it to pay the application fee in designated banks. When the latter captures the payment slip's barcode, an SMS is instantly sent to the mobile phone number that was entered in the system when the applicant was filling in the online system (Kyambogo University, 2013). The system also sends an email to the applicant's email address, to confirm receipt of payment.

As a result, the ICT initiative saved the university from student congestion during the period of receiving applications since there was no need for prospective students to go to the admissions office or the registry to pick or hand in completed application forms; one only needed a computer connected to internet, and a printer. Additionally, applicants did not have to pick bank-slips from the University before paying in banks; the online application system-generated bar-coded payment slips would be printed from anywhere and used to pay from any branch of the designated banks in the country. Furthermore, the university holds the system in high esteem because it is posed to reduce forgery significantly. This is because applicants were and are not required to indicate the subjects they did at A' Level at the time of filling in the online form. The user only supplies the name of his/her A Level School and index number. Once the period for receiving applications ends, a mechanism is in place to link the online platform with the Uganda National Examination Board systems so that the applicants' authentic A' Level results are generated to populate the respective forms.

It is hoped that if two crucial functionalities which are missing in the system are added, the system will attain global standards. The missing utilities are acceptance of online payments through debit and credit cards; and a provision for uploading attachments.

3.3 Gaps and challenges to e-Governance in Uganda

Literature highlights a number of bottlenecks that have hindered the country's progress towards eGovernance. Besides absence of a national eGovernance plan, many bottlenecks stifle expansion of use of ICTs in accessing public services as indicated below.

Firstly, internet connectivity remains unaffordable to many Ugandans. Hence Internet coverage is low. Furthermore, the bandwidth is always low (few can afford high bandwidth) to spur efficient online service delivery. To worsen matters, many programmes undertaken to boost internet or data transmission coverage are always either poorly monitored or eroded by corruption. For instance the National Backbone Optic Fibre Project is widely reported to have suffered many flaws, the most outstanding ones being the installation by Huawei (the contractor) of an inferior cable type (G-652 instead of G-655), and inflating of the cost of the project (The New Vision Friday September 28, 2012).

Secondly, most eGovernance initiatives in Uganda are largely funded or initially dependent on external funding; this has implications on sustainability when external funding expires. For example, when IICD phased out support to the e-Society initiative that was launched in 2009 in Kasese District of Uganda to help civil society organisations and citizens to exert

more influence over local government through active participation in planning, development and feedback processes, sustainability concerns gripped the stakeholders including IICD itself (IICD, 2010). The World Bank and African Development Bank raise concern that the dominance of donor-funded e-Governance initiatives amidst absence of adequately ratified sectoral-specific ICT policies is fuelling the characteristic lack of focus reminiscent of ICTs initiatives in Uganda (Souter et al., 2013).

Furthermore, some legislation is viewed by some sections of the general public as an infringement on the private use of ICTs (Amnesty International, 2010) hence a detriment to eGovernance. An example is the Regulation of Interception of Communications Act 2010 Laws of Uganda, which authorises government to intercept communication over telephones and internet for security reasons. Whereas the law has good intentions, flaws in the implementation procedure have been cited to bear traits of scaring ICT users.

It is also argued that most eGovernance plans stop at district headquarters leaving rural areas cut off; even where attempts have been made to link such areas, poor network signals (in case of mobile telephony and related technologies) hamper progress. Besides, general illiteracy (inability to read and write) and ICT illiteracy (the inability to use digital tools, communication technology, and networks to manipulate and relay information) remain key challenges in the developing world, Uganda inclusive (OTF Group, 2008; Uganda Communications Commission, 2009; Awad, El-Gheriani, & Zeid, 2010). Hence they pose an impediment to attainment of eGovernance objectives.

It is also logical that for eGovernance to trickle down to the grassroots, District Local Governments (as a minimum) ought to have operational websites. Sadly, literature reveals that many districts lack websites; while 78 district websites had been commissioned by 2010, only 20 were operational (Nabutsabi, 2012). Worse still, the few operational ones are seldom updated and their usability is wanting. For example, in their paper titled *Usability of Government Websites in Uganda*, Asimwe and Lim (2010) report that many government websites are just partially usable owing to flaws in “design layout, navigation and legal policies”. The sites also hardly cater for persons with disabilities yet e-Governance is expected to be all-inclusive. Personal experience also revealed that many of government websites in Uganda are non-interactive which is unfortunate given the fact that the era of web2.0 dawned long ago. The websites are also seldom updated. And many of them are laden with graphics amidst low bandwidth which makes loading of web pages occur at snail speeds.

Cyber crime is another growing hindrance to maturation of eGovernance as it scares away current and prospective internet users. Asama (2011) defines cyber crime as a felony committed using a computer. He cites the following as examples: social engineering, cyber terrorism, cyber prostitution, publication of illegal content, electronic fund transfer fraud, telecom fraud, software piracy, identity theft, scamming, and hacking, among others. These are a stumbling block as Ugandans attempt to adopt use of networked ICTs. Deibert (2011) stresses that for many countries, cyber criminology has become more than a nuisance; it is a national security concern. Discourse now indicates that to the Internet-savvy, logging into an online service these days is analogous to joining a warfare frontline; you do so amidst many potential attacks from online fraudsters, identity theft traps, etc. For instance ATMs, corporate, and government online platforms in Uganda have witnessed a spate of attacks from Kampala City’s notorious internet hacking group code named *Tusobola Net*, a local dialect term literary meaning “we can handle the Internet” (Masaba, 2013). According to this source,

the group consists of Ugandan university students who receive mentorship from some foreigners.

4, Discussion and Conclusion

EGovernance in Uganda is fledgling. So far, taking Baguma's classification of eGovernance (see introduction and background) as a benchmark, e-Administration is at the forefront, with some elements of e-Services in second position. The strong ingredient of Uganda's eGovernance environment so far is the relatively good legal and regulatory environment which exhibits a potential of fostering seamless adoption of ICTs in service delivery. The country's greatest eGovernance challenge especially at strategic level seems to be dominance of donor-funded ICT initiatives (e.g. mTrac, DistrictNet, e-Society in Ruwenzori Region, District Administrative Network Programme, TextToChange, etc). Such initiatives are associated with sustainability shocks once the period of donor support expires, rendering continuity virtually impossible. This seems to explain why, so far, only mobile phone based eGovernance innovations have tended to be more successful since the platforms (mobile phones) are not reliant on external funding. More saddening is the fact that even where government has tried to finance ICT projects heavily, corruption and poor monitoring have tended to derail the undertakings.

Therefore unless the bottlenecks identified above are addressed, the country's ICT initiatives for eGovernance have a long way to go. They will always remain at project level instead of being rolled out nationally so that the services under eGovernance increase in scope to, at least, match countries like India where a multitude of online services (income tax, passport and Visa, company affairs, central excise, pensions, land records, road transport, property registration, agriculture, municipalities, Gram Panchayats (for rural India), police, employment exchange, e-courts, among others) are accessible through ICTs.

Luckily there are prospects that point to a nearing tipping point: the laying of the national fibre optic data backbone, the rapid growth of mobile internet subscriptions; the Universal Primary and Secondary Education programmes which are posed to reduce illiteracy levels tremendously; the increasing ICT innovativeness among young Ugandans as evidenced by Titus Mawano's invention of "Ffene", a low cost management application that can help small business owners to monitor businesses remotely; Aaron Tushabe, Joshua Okello and Josiah Kavuma's (students of Makerere University) invention of WinSenga, a mobile phone solution for prenatal maternity examinations; Joshua Businge, Josiah Kavuma, Simon Lubambo, and Brian Gitta's invention of the Matibabu kit for testing malaria through use of light rays without using blood samples (Nakkazi, 2012; Busharizi, 2013; Mugabe, 2013) among others.

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