The nature and accessibility of e-government in sub-Saharan Africa

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Electronic government (e-government) is a phenomenon that is linked to the information society and the advantages associated with it. E-government allows government departments to network and integrate their services using information and communication technologies (ICTs) in order to improve service delivery and enhance the relationship between the government and the public. The major ingredients of e-government are infrastructure, human resources and information. The reality in sub-Saharan Africa (SSA) is that all these ingredients are insufficient. The ICT infrastructure is not widely available to rural populations. In most cases, both government officials and the people who may want to use government services online lack basic skills. Moreover, government information is not properly organised, as records management systems in many countries are collapsing.

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Background and introduction

Information and communication technologies (ICTs) have changed the process of governing in the world. Power relations between governments and the governed have been transformed from being mainly vertical and hierarchical, and structured along rigid and well-defined departmental boundaries to being horizontal, networked and participatory. According to Manuel Castells (1996:29):

We are living through one of those rare intervals in history. An interval characterized by the transformation of our "material" culture by the works of a new technological paradigm organised around information technologies.

Information technologies have brought about an epoch in history that has been described using labels such as the "network age" (Castells, 2001), "information society" and "knowledge economy" (Heiskanen & Hearn, 2004). Governments in the developed world have responded to the opportunities offered by the information society to offer value-added services to their citizens through electronic government (e-government).

Countries in sub-Saharan Africa (SSA), however, have not adequately restructured public bureaucracies in response to the demands of the information society. Many governments are still hierarchical, lacking accountability and transparency. Public bureaucracies still enjoy the monopoly of power and authority. Elected officials rarely relate closely with the electorate, and only consult them when they need their votes every four or five years. In addition, government information systems are still mainly manually operated and paper based.

The situation in SSA is compounded by the fact that some bureaucrats and politicians view the ICT revolution as a "highly political affair and not a technical challenge" (Wilson III, 2004:6). There is a need for change management and for change in the mindsets of many governments in SSA if e-government initiatives are to succeed. Governments in many developed countries have shifted from being public bureaucratic oriented and unrepresentative, to being citizen oriented as a result of the challenges and opportunities posed to government processes by the information revolution. They have taken advantage of this "revolution" to make government processes, services and information available online in an interactive and open manner. That response has been characterised as "e-government".

E-government promotes a better life that is characterised by representative and participative democracy; transparent, open and collaborative decision making; close relationships between government, business and citizens; enhanced service delivery; new infrastructure and infostructure; integrated and seamless government services that cut across departmental boundaries and provide a convenient and timely one-stop service to citizens; and equity in the provision of government services (Lenihan, 2002; Zakareya et al., 2004). Put differently, e-government offers the possibility of increasing honesty, efficiency and effectiveness, accountability and participatory democracy in the interaction between the government and the citizens.

Many governments in SSA recognise the potential benefits they can get from the information society and knowledge economy that are driven by ICTs. However, there are factors linked to the infrastructure and infostructure that inhibit their full participation in the information-intensive society that exploits new archetypes of knowledge creation and distribution.

Defining e-government

Definitions of e-government abound (Curtin et al., 2003; Oliver & Sanders, 2004:2, 5; Yong & Hiap Koon, 2005:11). Table 1 depicts a variety of definitions that have been proposed. The 12 definitions converge around the use of technology and the provision of service delivery in the conducting of government business. Although e-government is often defined as "online government" or "Internet-based government", many non-Internet "electronic government" technologies such as the telephone, fax, short message service (SMS), multimedia messaging service (MMS), wireless networks, Bluetooth, television and radio-based delivery of government services can be used in the context of e-government (Anttiroiko & Malkia, 2006; Heeks, 2004).

From the definitions given in Table 1, we may characterise e-government as an innovative attempt to take advantage of ICTs to facilitate citizens' access to government information and

Source	Definition
1	The use of any and all forms of ICT by governments and their agents to enhance operations, the delivery of public information and services, citizen engagement and public participation, and the very process of governance (Curtin et al., 2003).
2	A way to strengthen the flow of information to citizens, and to improve citizen access to government programmes and services. There is also an assumption that the resulting transformation will make government more efficient, more responsive, more accountable, and perhaps even more democratic (Gibbons, 2004).
3	The use of information and information technologies in government settings (Gil-Garcia & Martinez-Moyano, 2007:266).
4	The use of ICTs to improve the activities of public sector organisations (Heeks, 2004).
5	It is about facilitating the life of citizens and businesses by increasing the efficiency, quality and user-friendliness of government, as well as improving governance (Liikanen, 2003:84).
6	It refers to government's use of technology, particularly Web-based Internet applications, to enhance the access to and delivery of government information and service to citizens, business partners, employees, other agencies, and government entities (McClure, 2001).
7	The response by government to the economic and social demands of an information society and a knowledge-based economy (Milner, 2002).
8	The use of ICTs to transform government by making it more accessible, effective and accountable (Sakowicz, 2003).
9	Utilising the Internet and the World Wide Web for delivering government information and services to citizens (UN, 2002).
10	A government that applies ICTs to transform its internal and external relationships (UN, 2003).
11	The use by government agencies of information technologies (such as wide area networks, the Internet and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government (World Bank, 2007a).
12	The use of technology by government to enhance access to, and delivery of, public services to benefit business partners and employees (Yong & Hiap Koon, 2005:11).

Table 1: Selected definitions of e-government found in the literature

services in order to support social, economic and political development, improve the quality of public services, and provide an avenue for citizens to interact with government institutions and processes in a democratic, transparent and equitable way.

Drivers of e-governance

The major drivers of e-government have been sketched as technological (Culbertson, 2004:59; Hai Suan, 2005:450; OECD, 2000), organisational and environmental (Zakareya, 2004). Technology should not be emphasised to the detriment of other factors such as politics, legal frameworks and the environment. Technological determinism does not fully explain the evolution of e-

government. While technological progress in government, ITC infrastructure and available ICT expertise may influence the implementation of e-government, the support and active commitment of influential politicians may play a significant role in promoting e-governance "buy in" (Zaka-reya, 2004). According to Ernest Wilson III (2004: 13), if politics is wrong, then the other major drivers of e-government will not work. Leader-ship should be committed to "press changes in the face of institutional rigidity, technological backwardness and political resistance".

SSA leaders have not shown full commitment towards improving ICT infrastructure in order to transform government processes. The adoption of the African Information Society Initiative in 1996 held hope for Africa. The initiative aimed at

Source	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
1	One-way communication	Two-way communication	Complex transactions	Integration across government processes (Elmagarmid & McIver, 2001)			
2	Initial presence (individual webpages with static information)	Extended presence (dynamic information with links to other government pages)	Interactive presence (portal with secure access)	Transactional presence (detailed portal providing secure electronic payments of fines and taxes)	Vertical integration (government processes and structures integrated)	Horizontal integration (government services cut across boundaries)	Totally integrated presence – vertical and horizontal integration (Gil-Garcia & Martinez-Moyano, 2007)
3	Publish (using ICT to expand access to government information)	Interact (broadening civic participation in government)	Transaction (making government services available online) (*info*Dev, 2002)				
4	Catalogue (downloadable forms)	Transaction	Vertical integration (systems hierarchically connected with limited functionalities)	Horizontal integration (systems integrated) (Layne & Lee, 2001)			
5	Information in brochure-like form	Citizens use technology to interact with government (one-way interaction with government)	Online transactions and sending of tender information	Integrated portal for all government services and information (Symonds, 2000)			
6	Emerging presence (static organisational information)	Enhanced presence (dynamic information and publications)	Interactive presence (access to government institutions and services)	Transactional presence (complete and secure transactions)	Seamless or fully integrated (services fully available) (UN, 2002)		
7	Initiation	Infusion	Customisation (Watson & Mundy, 2001)				

Table 2: Models of the development of e-government found in the literature

providing an action framework to build Africa's information and communication infrastructure, but little progress was witnessed due to a lack of resources and political will. Perhaps SSA should pin its hopes on the New Partnership for Africa's Development (NEPAD), which partly aims at championing ICT development in Africa.

E-government can be implemented successfully if it is regulated by a legal framework (Hai Suan, 2005:450). Legal issues revolve around cyber-security, digital signatures, and personal data protection and confidentiality. Digital signatures should be recognised by law so that they have the same integrity as paper-based ones. Laws limiting the government's power vis-à-vis the individual in terms of the control of personal information should be passed. SSA has been very slow in enacting privacy laws and access to information legislation. Principles of fair inform-ation practices and data protection laws are not prevalent in the region. Citizens may not be confident to participate in e-government pro-grammes and trust the system if their privacy is not guaranteed.

Models of e-government

Studies on electronic government have been definitional, evolutionary and stakeholder oriented (Gil-Garcia & Martinez-Moyano, 2007). Evolutionary studies focus on what Layne & Lee (2001) refer to as "stages of growth" models for fully functional e-government. The model-based paradigm has dominated the theoretical frame-work used in e-government research (Heeks & Bailur, 2007). Although these models appear to be mechanistic in their approach, they provide a useful tool for evaluating the development of e-government in a given context. A summary of some of the stage models is presented in Table 2 on the previous page.

Models used to depict e-government suggest that there are a number of distinct phases in its development (Elmagarmid & McIver, 2001; Gil-Garcia & Martinez-Moyano, 2007; Layne & Lee, 2001; Sahraoui, 2007; Symonds, 2000; UN, 2002; Watson & Mundy, 2001). There is limited Internet presence in the first phase of the development of e-government, and information is static and basic with a one-way interface between citizens and the government. Angola, Botswana, Burundi, Cape Verde, Central African Republic, Ethiopia,

Gabon, Gambia, Guinea, Lesotho, Madagascar, Malawi, Mali, Niger, Seychelles and Togo are becoming e-government players and they are estimated to be at this stage (UN, 2003).

Dynamic and enhanced online information is made available to the citizens during the second stage, but the communication is still mainly one-way (UN, 2002). Internet portals are designed to integrate government activities and processes in order to facilitate online interaction between the citizens, business and other stakeholders. Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Kenya, Mauritania, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, Swazi-land, Tanzania, Uganda, Zambia and Zimbabwe appear to be at this stage (Gil-Garcia & Martinez-Moyano, 2007).

The third phase provides more interactive interfaces between all stakeholders. At this stage, e-government integrates "the complete range of government services, provides a path to them that is based on need and function, not on department or agency" (Symonds, 2000). For instance, citizens may be able to register a birth or death, apply for a social welfare grant, pay taxes, access government legislation and find information on activities of their representatives in parliament and local government without having to leave their homes or offices. Mauritius and South Africa are believed to be reaching this stage. For instance, citizens can file income tax returns on interactive online systems. However, Internet access is still beyond the reach of many citizens in these countries.

Although the fourth phase is an improvement on the third one, it offers more customised and secure services, as there is provision for passwords and other security features. All the stakeholders begin to realise the benefits of e-government, such as fostering democratic processes, promoting accountability, increasing citizen participation and engagement, and delivering efficient and effective government services. Some models go further than these four phases – see, for example, Gil-Garcia & Martinez-Moyano (2007) and UN (2002) in Table 2. However, the first four stages seem to provide the fundamental features of the evolution of e-government in varying details and complexity. Other models that go further than four phases offer some variant of the four-phase "Web development stage model". No country in SSA

has achieved the fourth stage of e-government development.

Using the framework given above and the 2001 UN e-government index, which classified countries having high e-government capacity with a score of 2.00–3.25, medium e-government capacity (1.60–1.99), minimal e-government capacity (1.00–1.59) and deficient e-government capacity (below 1.00), it is apparent that more than 60% of the countries in SSA have a score below 1.00 (UN, 2002). Some countries might have moved closer to e-government in the interim, but the conclusion that e-government is still in its infancy in SSA is inescapable.

Many government websites are not fully functional and they are populated with information that does not enhance service delivery or participatory democracy. A fully functional e-government website should have an e-participation framework that provides information on policies and programmes, budgets, laws and regulations, e-consultation mechanisms and tools, and e-decision making (UN, 2003). Governments with an e-participation framework are participatory and inclusive. In many instances citizens are still obliged to visit government offices even if they may download certain documents from government portals, as they may not be processed online. The possibility of coming face to face with bureaucratic red-tape practices and an inefficient or corrupt government official still exists in many countries in SSA.

E-government is attainable: Lessons from elsewhere

Canada, New Zealand and Singapore are among the top 20 leading countries in relation to e-government (Curtin et al., 2003; UN, 2002, 2003). In Singapore, for example, citizens can pay their parking tickets, job seekers can search for employment, people can change their postal addresses, debtors can petition for bankruptcy, and public trustees can file an application for estate administration using opportunities provided by e-government (Henderson, 2002). Singapore's e-government project was built on a strong ICT foundation and a dynamic e-Government Action Plan (Lim & Low, 2003). Canada's e-government project tapped into the high level of connectivity and high ICT literacy or e-literacy levels of Canadians (D'Auray, 2003:33). In New

Zealand, it was driven by a central coordinating organisation, the E-Government Unit (EGU) which, according to Boyle & Nicholson (2003:90–91):

- Developed an e-government strategy
- Formulated standards and guidelines
- Provided leadership to facilitate achievement of the e-government vision and strategy
- Identified and coordinated opportunities for collaboration across government departments
- Monitored progress made towards achieving e-government

It is evident from these examples that e-government is attainable. The implementation of such programmes mainly hinges on sound ICT infrastructure, clearly defined e-government strategy and vision, strong government commitment, information literacy and e-literacy, as well as connectivity.

Unfortunately for SSA, many countries lack an e-government strategy and vision. Many citizens are IT-illiterate and the quality of government information is poor. Standards to ensure interoperability and portability of government information systems are inadequate. Human resources are scarce due to brain drain and a lack of capacity-building programmes. Many governments do not have laws, policies and standards for privacy protection and information access. Many government websites do not have a privacy policy. Concerns about privacy and confidentiality impede the development of e-government. Government departments for coordinating and overseeing the implementation of e-government projects are absent in many countries in SSA, and are grossly underresourced in instances where they do exist.

Challenges facing sub-Saharan Africa on the road to e-government

Some 17 challenges and opportunities of e-government implementation have been outlined in the literature (*info*Dev, 2002). They include infrastructure development, law and public policy, the digital divide, e-literacy, accessibility, trust, privacy, security, transparency, interoperability, records management, permanent availability and preservation, education and marketing, public sector and private sector partnerships, workforce issues, cost structures and benchmarking (*info*Dev, 2002). The next sections

collectively deal with some of these overlapping challenges.

Access to ICTs in Africa

ICTs provide information and services to people cheaply, efficiently and effectively (Elmagarmid & McIver, 2001; Henderson, 2002; McClure, 2001). The use of ICTs can "systematize the transparency of governance" by "providing relevant and timely information in large quantities" (Kim et al., 2005). Although the implementation of e-government programmes involves the use of many ICT applications, it is the Internet that is the most widely recognised and identifiable component driving e-government (UN, 2002).

The lack of telecommunication infrastructure in Africa has seriously restricted use of the Internet and the adoption of e-government in SSA. Furthermore, Internet connection charges are beyond the reach of the average person in many countries in SSA. In 2002, one in 40 people in SSA had a fixed telephone line, one in 130 had a personal computer and one in 160 used the Internet (APC, 2002) – and the situation has not changed dramatically since then.

Most of the existing telecommunications infrastructure does not reach the bulk of the population. In fact, Tokyo "has more telephone lines than sub-Saharan Africa put together" (Mbeki, 2000). Some 50% of the available lines are concentrated in the cities, where only about 10% of the population lives. The ICT foundation is weak and there is no universal access to the Internet. Irregular or non-existent electricity supply is a major barrier to the use of ICT, especially outside major towns. Power outages are experienced. For instance, a cyber café in Kenya had to close shop as result of the unreliable power supply (Kathuri & Nyasato, 2007).

Bandwidth is also a problem in some countries in SSA. For instance, the World Bank report on the African region communications infrastructure programme of 2007 pointed out that the eastern and southern African region suffers bandwidth deficiency, as it accounts for less than 1% of the world's international bandwidth capacity (World Bank, 2007b). Limited connectivity and costly access hinder the potential of SSA to utilise ICTs to promote social participation and improve government efficiency and transparency.

Inequitable access to ICTs (such as personal computers, Internet, telephones, cable and other Internet-related technologies) by individuals or groups of people in their countries in order for them to benefit from the government processes driven by ICTs is another challenge facing governments in SSA. The disparities related to accessing ICTs have been characterised as the "digital divide".

The level of e-government readiness in a country is partly measured by its access to ICTs. The UN E-government Readiness Index of 2003 showed that South Africa was the only country in SSA that was among the top 100 countries in relation to e-readiness (UN, 2003). The index of the US, the country leading in this regard in the world, was 0.927, whereas South Africa was pegged at 0.515. The country in SSA ranked fifth was Namibia, at 0.34. South Africa remained among the top 100 countries in the Economist Intelligence Unit's e-readiness ranking of 2006 and it was joined by Nigeria (EIU, 2006).

Information literacy and e-literacy

Information literacy is fundamental to the use of information resources in the knowledge age (Braaksma, 2004:151). Information literacy refers to a person's ability to "recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information" (ALA, 1989). Literacy today also means ICT literacy and skills (UN, 2003). ICT literacy among the citizens has a significant role to play in implementing e-government, as it is fundamental to the ability of citizens to access and use the electronic information. However, information literacy policies are deficient and literacy levels are extremely low in SSA.

Information management: The Achilles' heel of e-government in sub-Saharan Africa

Government's provision of access to information is the foundation of a democratic society. Information partly facilitates decision making, citizen oversight of government departments and their decisions, and citizen debate on policy issues and policy formulation (Eschenfelder & Miller, 2007: 83). Information management in general, and

records management in particular, is a cornerstone of government information systems and effective access to information.

The advent of ICTs has brought about a paradigm shift in the production of government information. Government processes are mainly generating electronic records as evidence of the government's conduct of business. This is all happening at time when many records managers in SSA do not have the necessary professional capability to deal with electronic records. Weak institutional capacity and the absence of comprehensive records management policies, guidelines and practical standards have aggravated the situation (Ngulube & Tafor, 2006:58; Wamukoya & Mutula, 2005:72).

The management of e-records will continue to pose the greatest challenge to the implementation of e-government until the capacity of SSA to handle e-records is enhanced. Building an e-government environment that provides authentic and reliable information for decision making and holding the government accountable would remain elusive if SSA does not have the following (Lipchack & McDonald, 2003:2):

... the capacity to create, manage, share and use electronic information (and related technology) to improve governance, as well as to sustain international trade and innovation; improve global security and support other activities in our increasingly inter-connected and inter-dependent world.

Conclusion and recommendations

It is evident that e-government has the possibility of making government processes transparent and accountable. However, SSA has to overcome obstacles such as the lack of infrastructure and infostructure before it can have fully functional e-government programmes. According to the UN (2003), e-government:

... readiness strategies and programmes will be able to be effective […] only if people at the very minimum, [had] functional literacy and education, which includes knowledge of computer and Internet use; all are connected to a computer; and all have access to the Internet.

The education system should be sensitive to the challenges ushered in by e-government and come up with strategies to equip students with skills required in the e-government environment. Governments in SSA should utilise the existing information infrastructure based on libraries and telecentres rather than starting from scratch when implementing e-government programmes. These facilities are accessible to many people and some of them are close to rural populations. For instance, public libraries have become de facto e-government access points in states such as Florida in the US (Bertot et al., 2006). What is required of governments in SSA is just to increase funding to these institutions so that they will be able to provide access to computing and Internet services to support e-government.

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