A Comparative Study of eAdoption Activities in South Africa and Mozambique

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Abstract: This paper reviews the status of eAdoption in South Africa and Mozambique. It describes the ICT strategy including current and planned enabling legislation, the identification of key stakeholder responsible for policy and implementation, and summarises overall progress on eAdoption initiatives. The comparative analysis of the two countries reveals many similar challenges but also provides a basis for the identification of "good practices" and lessons learned that can be shared with other countries on the continent.

1. Introduction

The World Summit on the Information Society (WSIS), highlighted the growing importance of the role of ICTs, not only as a medium of communication, but also as a development enabler, and as a tool for the achievement of the Millennium Development Goals (MDGs).

Compared to other developing nations, African countries are at comparatively low levels of e-readiness as a result of a number of factors including inadequate telecommunications infrastructure, high telecommunication costs, low literacy levels, and lack of enabling policy and legal frameworks.

The challenges faced by the continent as a result of this are to lower the cost of communication, increasing universal access including access to broadband, modernising broadcasting signal distribution infrastructure and the development of local content as well as effecting targeted interventions to address the challenges of the second economy [1].

This paper reviews the status of eAdoption in South Africa and Mozambique. It describes and compares the ICT strategy of both countries including current and planned enabling legislation, the identification of key stakeholders responsible for policy and implementation and summarises overall progress in eAdoption initiatives.

2. Objectives

The objective of this paper is to provide a baseline understanding of current research and exploitation of applied ICTs in Mozambique and South Africa in the areas of eGovernment,

eHealth and eLearning and ICT skills as these are seen as critical areas for economic and social impact of applied ICT in Africa.

The comparative analysis of the two countries can help reveal different approaches to similar challenges and also provides a basis for the identification of "good practices" and lessons learned that can be shared with other countries on the continent.

A further objective is also to provide an overview of the government agencies in Mozambique and South Africa who are currently responsible for eAdoption within the core thematic areas. This facilitates the opportunity to co-ordinate with relevant stakeholders when endeavouring to undertake future research collaboration.

3. Methodology

The methodology used will be a review of both countries National ICT strategy including current and planned enabling legislation, identification of key stakeholders responsible for policy and implementation, and a description of eAdoption initiatives.

4. Overview of South Africa and Mozambique

The Republic of South Africa is bordered by Botswana, Lesotho, Mozambique, Namibia and Zimbabwe. 65% of the population (46 888 200 Statistics South Africa 2005) is aged between 15 and 64 (median 24.5 years). Mozambique has a population of 18.96 million [2] with significant variations in population density within the country, with higher population concentrations along the coast and in specific economic and transportation corridors

Literacy levels in South Africa are 86.4% [3] compared with 54% [4] in Mozambique. South Africa has 11 official languages including Afrikaans and English whilst Mozambique's first language is Portuguese.

South Africa is a middle-income country with per capita GNI (Gross National Income) of $2750 (2003) whilst Mozambique is a low income country with per capita GNI of $210 (2003) [5]. The comparison shows South Africa to be one of the wealthiest countries in Africa and Mozambique one of the poorest. The Government of Mozambique has implemented a poverty reduction program, where the development focus for the ICT sector is the achievement of equity.

5. South Africa and Mozambique ICT Sector Review

Telecommunications Infrastructure

In terms of telecommunications the balance between fixed and mobile services has shifted in both countries with fixed line services decreasing and mobile penetration increasing. In 2003, there were a total of 23 per 1000 people with mobile phones in Mozambique compared with 364 per 1000 [5] in South Africa where mobile penetration has risen above the critical 40% threshold and well over one third of the population (more than 19 million) own a mobile phone [6]. Approximately 30% of Mozambique's landmass is already reachable by mobile signal, and more than two thirds coverage is estimated in South Africa.

In Mozambique, the telecommunications infrastructure consists of a national backbone, covering all provinces up to the district level. This network is a combination of different

technologies such as VSAT, wireless loop, copper cable and fiber optic cable along the coast now being extended to include non-coastal provinces.

Internet costs in Mozambique for 20 hours of use per month in 2003 were $51 compared to $33 [5] in South Africa. However, the cost of internet access in South Africa is still exorbitantly high. Research by the South Africa Foundation, shows that in South Africa fees are up to 400% higher than the cost of similar services in 13 comparable countries [7]. This has resulted in the disconnection of over 850,000 telephone lines in the past few years [8]. This low penetration has serious consequences not only in terms of voice communication but also for internet access.

The provision of e-mail and internet services in Mozambique was initiated by the Eduardo Mondlane University Informatics Centre (CIUEM) in 1993. Now there are around 10-12 active ISPs in the country and an estimated number of 3 internet users per 1000 people while in SA there are 33 internet users per 1000 people [5].

Mozambique has a number of radio stations, including community radios, which play an important role in the remote areas in the context of information, education, culture, health and civic campaigns. The radio network covers approximately 60-70% of the population throughout the country.

Policy and Regulatory Environment

The South African vision aspires to move the country from being a consumer of ICT products and services to being a major player in the production and innovation of these products and services. The cornerstones of this Inclusive Information Society are a vibrant and thriving ICT sector, an enabling policy and regulatory environment, accessible ICT infrastructure and broadband connectivity, and an appropriately skilled and knowledgeable citizenry [1].

In South Africa key enabling legislative and policy frameworks have been implemented to support this vision including the Electronic Communications and Transactions Act (2002), the Telecommunications Act 1996 (and amendments) and the Convergence Bill.

The Electronic Communications and Transactions Act (2002) was a key step taken towards regulating electronic communications and transactions in furtherance of the information economy and general social prosperity. The Act provides for the development of a national e-strategy; the promotion of universal access to electronic communications and transactions and the use of electronic transactions by SMMEs; supports human resource development; and encourages the use of e-Government services [9].

The Convergence Bill is aimed at removing policies that hinder the development of cross-sector applications, services and businesses, Once promulgated, the legislation will reflect the integration of telecommunications with IT, broadcasting and broadcasting signal distribution. Convergence legislation will ensure that citizens are empowered with better access to knowledge and information at competitive prices, and encourage investment and economic growth.

The strategy of the Department of Communications is to develop policies and legislation aimed at liberalising the telecommunications sector to grow the economy, attract foreign direct investment, increase competition, encourage broad-based BEE and develop and sustain SMMEs. The Telkom IPO was one of the first steps. Liberalisation should also

improve service delivery and expand the provision of telecommunications services. The introduction of the under-serviced area licences will enable marginalised communities to receive telecommunications services while creating telecommunications SMMEs in the rural areas.

Other enabling legislative and policy frameworks have been provided by various South African government departments in support of integrating ICTs into teaching and learning, health and government. The Department of Public Service Administration is responsible for developing the eGovernment strategy and has made significant progress in co-ordinating other government departments and agencies. This strategy will be implemented by the State Information Technology Agency (SITA). The Departments of Health and Education have both addressed the challenges of ICTs in their legislative processes i.e. drafting of strategic priorities for the National Health System for the period 2004 – 2009 and the Draft White Paper on e-Education (2003) [10].

The Government of Mozambique approved, in December 2000, an ICT Policy and in June 2002 the cabinet approved the ICT Policy Implementation Strategy. The ICT Policy defines the priorities areas for future actions, namely education, human resource development, health, infrastructure, universal access and governance. The ICT Policy Implementation Strategy has as the main aim to translate the ICT Policy objectives into a tangible reality [11].

In order to address the limited access to telecommunications and ICT infrastructure across most rural areas, within the telecommunication reform project the Government is developing the Policy, Strategy and Pilot Project for Universal Access and is drafting enabling eLegislation.

Some of the objectives of the Mozambiquan Universal Access Policy are to extend the fibre and microwave backbone, which today reaches only half of the provincial capitals and a minority of district centres and to provide telecentres with internet access in all district centres.

The provision of Internet based services by Mozambiquan banks, resulted in the urgent requirement to establish rules and legal instruments (e-legislation) to improve the legal certainty and security of on-line business transactions (both e-government and e-commerce) and on-line activities in general. Thus, in 2005 the government has started drafting the Mozambican eLegislation, which will create the required legal certainty for the occurrence of e-business, e-commerce, and e-government transactions.

Key stakeholders

In 2001 the South African Presidential National Commission on Information Society and Development (PNC on ISAD), and a Presidential International Advisory Council on Information Society and Development (PIAC on ISAD), consisting of representatives from the international, public and private sectors, were established.

The Department of Communications is responsible for policies and legislation that promote South Africa as a global leader in harnessing Information Communications Technologies for socio-economic development. The Department of Public Service Administration is developing the eGovernment strategy and has made significant progress

in co-ordinating other government departments and agencies. This strategy will be implemented by the State Information Technology Agency (SITA).

The key Mozambiquan stakeholders responsible for policy are the ICT Policy Commission (CPInfo) and the ICT Policy Implementation Technical Unit (UTICT). The Government of Mozambique established an ICT Policy Commission in 1998 by Presidential Decree. This commission is chaired by the Prime-Minister and the current members are the ministers of Science and Technology (Vice-President), Education, Transport and Communications, Finance, Public Administration, Trade and Industry, the Directors of INCM (the telecommunications regulator) and UTICT [11].

A National Consultative Forum has been approved by the Mozambiquan Government as part of the ICT Policy Implementation Strategy. It will be composed of representatives of the Government (Public Sector), Private Sector, Civil Society, Education, Research Community, and Development Partners.

A number of ministries were involved in the strategy formulation process for the Universal Access Policy, eLegislation, and eGovernment strategy. These included the Ministry of Science and Technology, the Ministry of Education and Culture, the Ministry of Transport and Communication, the Ministry of Trade and Industry, the Ministry of Agriculture, Ministry of Interior and Ministry of Justice and the Ministry of State Administration.

The above ministries are also responsible for the implementation of projects proposed in the draft eGovernment Strategy, Universal Access Pilot Project, Provincial Digital Resource Centres and Telecentres.

6. eAdoption Activities

Significant advances in technology and policy are changing the eAdoption environment in both South Africa and Mozambique. Major innovations in technology are extending the reach of telecommunications into otherwise forgotten deep rural communities. South Africa is leading the continent in the implementation of broadband and ended 2005 with 120,000 users and these are set to double this year [6]. South Africa has also launched its first municipal owned communications network.

In the eGovernment domain, South Africa has made significant efforts to increase access for citizens in disadvantaged communities by improving ICT infrastructure in such geographic areas. Innovative mechanisms have been implemented to support the provision of community access to citizens and include the establishment of Multi-Purpose Community Centre's (MPCCs), Telecentres, e-Gateway Service Counters and Post Office Public Information Terminals (PITs). G2G activities include an inventory of government systems, eIGIS, and an integrated justice system IJS, a Smartcard-ID is under development that focuses on the automation of finger prints and the development of an electronic Population Registry [12].

A further strategy employed to increase affordable universal access is that of granting Under-serviced Area Licenses (USALs). The licensees are Small Medium Enterprises (SMEs) that provide telecommunication services in areas designated as under-serviced.

South Africa has worked hard at improving access including an e-Government information portal, called Batho Pele Gateway launched in 2004. The Batho Pele Gateway

Portal and the associated call centre provide an opportunity for the public to provide feedback and comment on the government Programme of Action or any other matter of interest to the citizen.

Mobile penetration in South Africa has risen to over 40% of the population increasing opportunities for multi-access to information. South Africa has leveraged the tools of multi-access government to promote “free and fair” national elections in 2004 the Electoral Commission (IEC) implemented an internet based eProcurement system with which the Commission achieved a number of procurement imperatives to streamline their procurement processes. There are many examples of local and provincial initiatives and G2B developments in revenue collection. Donor funded activities and Private Public Partnerships are in progress.

With regard to eHealth the South African Provinces have assumed responsibility for the implementation of telemedicine and Provincial plans have been adopted. The Eastern Cape is planning on providing connectivity to over 200 clinics this financial year. Other Provinces have similar plans. The Department’s partnership with the private sector will see the continued roll-out of the health channel to health facilities countrywide. The Electronic Patient Record will soon go to tender [13].

The South African Department of Education initiatives, include the Thutong Educational Portal, provides on-line curriculum resources and communication forums are important mechanisms of support that need to be utilised to the fullest. The Further Education and Training (FET) curriculum starting in 2006 has the stated aim of equipping learners with skills needed to find their place in a modern, global economy. ICT has a major role in the new curriculum, both in training in information technology and in use of ICT in all learning areas.

All South African universities and about 6000 schools are ICT enabled and an educational portal, Thutong, has been established to help educators and learners to access curriculum related information

In Mozambique [11] an ambitious programme for the development of infrastructure for the national telecommunications network is being implemented. Its principal objective is to assure the necessary infrastructural support for implementation of a truly national information network through a well-balanced package of projects providing an effective response to the country's needs.

To achieve these objectives, the country is mobilizing investment and financial resources into the design and implementation of projects with major structural impact, for example, the development of the National Transmission Network backbone and the expansion and modernization of the network and switching systems for digital telephony traffic in all provincial capitals and principal urban centres. Other projects include the expansion and modernisation of the network for metropolitan areas and suburbs of Maputo City, the integrated projects for rural communications and the development of mobile telephone networks.

An important component of the Mozambiquan National Transmission Network backbone is the submarine fibre optic link between Maputo and Beira with intermediate connection points in Xai-Xai, Inhambane and Vilanculos along an extension of nearly 1,000 km, with a 2.5 Gb/s capacity per pair of fibres. This important system that ensures the

availability of infrastructure to support broadband applications between the south and centre of the country is complemented by a high-capacity Hertzian digital-beam link between Beira and Chimoio, and between Chimoio and Tete.

While access to ICTs infrastructure is a major constraint in Mozambique, several measures have been put in place to extend the basic infrastructure needed to expand ICT use. The Ministry of Energy aims to electrify all district capitals by 2009. In rural areas electrification of Rural hospitals and secondary schools using solar power systems or other alternative sources of energy like diesel generators has been prioritised. Electrification in rural areas is also planned on a staged basis.

There are five National television broadcasting stations in Mozambique providing television coverage to the population. Radio broadcasting and community radio are traditionally important technologies for eAdoption for 70% of the population living in rural areas with low literacy levels. The media is important in reaching the population in rural areas and in providing content in local languages.

eHealth initiatives are focused on HIV/AIDS (e.g. Country Response Information System (CRIS), HIV/AIDS Response Project Database, and Sharing Best Practices). Telemedicine initiatives are being implemented in order to develop activities between two hospitals, and the introduction of Electronic Medical Records (eMR) in one hospital is underway.

eLearning & ICT for Education initiatives include SchoolNet Mozambique (known as e-Schools under NEPAD), supporting schools by building ICT access, facilitating training of teachers & authoring content, Ministry of Education and Culture (MEC) distance education activities, the Virtual Multimedia Academy (VMA) and African Virtual University initiatives in which Universidade Eduardo Mondlane (UEM) is involved representing Mozambique and the Mozambique ICT Institute (MICTI) initiative.

The Mozambiquan Ministry of Education and Culture has approved the integration of ICT into all educational activities to realize this objective. This will also extend to vocational and teacher training colleges.

Mozambique's Government's strategy to promote rural access is through community or group access centres. In this field, ongoing eAdoption initiatives include the Provincial Digital Resources Centres (CPRDs), telecentres, Digital Agencies and Multimedia Community Centres (CMCs).

Public Private Partnerships PPPs

In both South Africa and Mozambique there are a number of examples of Public Private Partnerships in ICTs for development. The corporate sector plays an important role in providing support to community programmes as well as in health and education programmes.

In many of these sectors there are significant capacity challenges particularly at the district and local government level and there is a need for stronger awareness and capacity building particularly in rural areas.

7. Challenges and Next Steps

Both South Africa and Mozambique face major challenges in the development of their Information Societies. The state of ICT in both countries is characterised by a lack of adequate infrastructure, high telecommunication costs, lack of trained ICT staff as well as low literacy levels particularly in Mozambique.

In terms of global ranking [14] Mozambique scores lower in terms of e-readiness (96) compared to South Africa (34). South Africa has the advantage of well established telecommunications and electricity infrastructure in urban areas but both countries face similar infrastructure challenges in rural areas.

Infrastructure backlogs that include physical buildings, electricity, facilities and other resources in rural areas have a significant impact on the ability of schools and clinics in both countries to roll out learning and healthcare using ICTs. There is also a lack of funding to address these backlogs. There is a low uptake of new and emerging technologies, especially in the areas of telemedicine application. This is related to the high cost of telemedicine applications.

The availability of infrastructure in rural areas is a major hindrance to rolling out connectivity in schools. South Africa and Mozambique are part of the NEPAD e-Schools Initiative. The e-Schools Demo Project will provide the basis for an ICT solution, especially for rural schools. Six schools per 16 African Countries are part of the project.

The state of ICT in both countries' governments is also characterised by lack of trained ICT staff as well as the lack of retention strategies for ICT personnel. Inadequate preparation for teachers is often a major constraint that impacts negatively on their ability to integrate ICTs into the curriculum. In addition, limited ICT awareness and literacy is a constraint to the effective management of ICT rollout at the institutional level. In most schools computers are used as information processing machines, such as typing letters, and as such are grossly under-utilised. The ability to manage and cope with changing demands is also a huge challenge among teachers.

The policy and legal frameworks reflect the differences in ICT infrastructure between the two countries. South Africa has an established telecommunications infrastructure but an outdated ICT policy that is under pressure from new market entrants and technologies. Mozambique has implemented a national ICT policy in a relatively "greenfields" environment characterised by low levels of infrastructure and competition.

South Africa faces challenges in reforming its ICT policies that currently favour the Telco monopoly and established telecommunication technologies. The South African government is being reactive and is currently reforming policy in order to increase affordable access and manage radio spectrum to accommodate these new technologies but these objectives have not been met yet. This is causing regulatory confusion and delaying investment in the country.

The main emphasis of Mozambiquan policy is on establishing a firm legal enabling environment, allowing the development of a national Internet userbase, and use this technical environment to establish and disseminate online services to users in major cities, in the provinces, districts and rural areas.

In both countries ICT government initiatives are fragmented. A major negative consequence of this is confusion and at times, conflict about accountability and responsibility that result from the actual or perceived overlap of roles between departments.

Mozambique has implemented a clear national ICT policy but in South Africa there is no clear strategic direction. Until there is a deliberate, coherent and clearly understood and supported national ICT policy and strategy in South Africa, it is unreasonable to expect attainment of durable results. Once the national ICT policy has been adopted this then needs to cascade down to each sector for health, education and government.

Progress in eGovernment, eHealth and eLearning is more advanced in South Africa whilst Mozambique has focused more on implementing major infrastructure plans to support these initiatives. Access remains a key challenge and universal access strategies are common to both countries. eGovernment strategies have been driven by the need to create an enabling environment for the banking and private sector for eCommerce.

Both South Africa and Mozambique lack a comprehensive and easily accessible evidence base to support strategic policy decision making and programme design to leverage ICTs for development. It further hampers international development reporting obligations on ICTs such as reporting requirements on the Millennium Development Goals and progress made towards the implementation of the World Summit on Information Society (WSIS) Plan of Action.

Providing access and achieving service delivery, particularly to rural areas, remain key challenges to both governments of South Africa and Mozambique. The exploitation and expansion of existing technologies such as mobile handsets, community radio and digital broadcast television should be considered due to the rapid growth and broad ownership of these technologies. However, strategies to improve internet penetration levels and broadband deployment are urgently required.

The high costs of telecommunications severely inhibit internet penetration in both countries. Increased co-operation to achieve inter-connectivity among regional Internet Exchange Points, IXPs, can provide a basis for lowering internet costs outside of the continent.

8. Conclusions

The status of eAdoption in South Africa and Mozambique has been reviewed and it is clear that both countries face many similar challenges. Building ICT infrastructure and capacity is not only crucial in improving communications but is also recognised as a key enabler for development in both countries in achieving the MDGs.

The high cost of telecommunications in both countries remains one of the major barriers to achieving critical mass for telecommunications to impact positively on economic growth. This is partly due to infrastructure limitations as well as the lack of effective liberalisation and regulation of the telecommunications sector.

Innovative funding solutions for infrastructure should be researched. Examples of Public Private Partnerships were given but more meaningful participation by the private sector, such as Build Own Operate Transfer models, could help “fast-track” infrastructure backlogs.

It is hoped that the documentation of current country eAdoption initiatives will inform policy at national, regional and international level, and provide a framework to support inter-government exchanges across Africa in the areas being addressed. Such a review of eAdoption initiatives can help determine future research collaboration opportunities for European and African organisations in these domains.

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