

eGovernment in Mozambique: Past, Future and New Prospects

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Abstract: This paper discusses the context, implications and prospects of development of electronic government in Mozambique, considering the increasing use of e-governance, its bases of implementation, actors involved and their modus operandi. The initiatives that took place since the creation of the ICT policy in Mozambique, the electronic government strategy and the projects in progress are considered. Internet access in Mozambique is nowadays carried out mostly through mobile devices. The study argues for the feasibility of implementation of effective e-government in Mozambique, which can be achieved by implementing a hybrid infrastructure of electronic services, accessible both via computer and mobile devices.

Keywords: ICTs, e-Government, GovNet, Mozambique

1. Introduction

Information and Communication Technologies (ICTs) are cross-cutting facilitating tools that offer opportunities for innovative solutions to all areas of development, in all locations, even the most peripheral ones. The evidence of massive usage of applications of ICT in domains such as e-health, e-learning, e-government, e-democracy, etc., is overwhelming [1], contributing to raise efficiency and effectiveness of institutions and their value for the citizens [2, 3]. Parallel to these processes, observations have been made showing that the provision of e-government (e-gov) services has been a relevant vehicle to improving the quality of government, public administration and access to public services [4-7].

Implementation of e-government in developing countries has been found somehow difficult and methodologically controversial. Challenges imposed are diverse, such as food security, pandemics and lack of infrastructures, which interfere in significant forms [6]. Other reasons arise from different political systems, demographic, cultural, and social factors, as well as levels of economic development. Important phenomena affecting successful deployment include differences between urban and rural populations, between levels of digital literacy, availability of technological resources, as well as lack of clear ICT policies [8, 9].

In Mozambique, there are important positive signs since the introduction of e-government, due to government and non-governmental organizations working in parallel. Initiatives for dissemination include the creation of informative sites of central and local governments, state wages payment systems, taxes, and import and exports management [10,11]. Nevertheless, a lack of effective use of the services is evident. An analysis of how e-government has been implemented and is being used in Mozambique is needed, in order to understanding its limitations and point new prospects or possible solutions.

The question of how to access the services on the part of end-users plays a key role. One of the factors we believe influences access and usability is that the majority of services are available only through computers, which does not meet end-user constraints. The purpose of this article is to demonstrate the relevance and extent of this problem in Mozambique.

In order to do so, a set of assumptions and a descriptive goal are outlined. On the assumptions side, in the next section we briefly recall the situation of Mozambique according to the e-government world ranking. Subsequently, we characterise available services according to maturity models. On the descriptive side, in section 3, the status of computerisation in Mozambique, the actors involved, and challenges to effective implementation are analysed, using both narrative and integrative reviews based on available literature and other informal sources. Finally, in section 4, we discuss possible solutions and prospects for the future.

2. E-government in the world and in developing countries

E-government has its origins linked to the government of Bill Clinton (USA), between the years 1990-1994, right in the course of Internet expansion. Hence and up today, it has been playing an important role in public administration, attracting researchers and other stakeholders, with a diversity of published studies reporting different stages of implementation and levels of adherence [2,8]. Ambiguous views over the difference between e-government and e-governance still endure. Mostly because the details are notable only when analysed from the standpoint of the framing and applicability. There are many definitions of e-government. Most of them state it as the use of new ICTs, in particular the Internet and mobile computing technology, in the management of government functions and for the improvement of services to citizens and companies [8, 15–18]. In another perspective, e-government means the transformation of traditional services and transactions into electronic transactions through various channels to provide access to beneficiaries, efficiently and at great speed [19, 20], promoting cost reduction, innovation, good quality of services [18], stimulating development and reducing poverty [19].

From our perspective e-government goes beyond the use of ICTs and transformation of services. It makes information and services available to citizens, promotes participation by approximation between government and citizens, higher inclusion and greater transparency. Electronic-governance (e-governance) has a greater focus on the application of ICT in administration and management within the organization itself, whether public or private, small, medium or large size [20]. In short, whereas e-government uses ICT to promote greater government efficiency, making services more accessible and applicable to citizens, e-governance refers to the applicability of ICTs to the governance system (policies and agendas), to increase citizen participation and organization in decision-making processes.

The reality in Mozambique shows that while citizens demand more information and public service, the few that are available do not cover all the country regions [21]. With e-government, it becomes possible to disseminate information and services more widely, promoting an active and participatory citizenship.

2.1. Mozambique in the e-government world ranking

The analysis of e-government world rankings may capture the specifics and dynamics of local contexts in term of government implementation and evolution. The ranking of e-government has been presented by the United Nations in the form of biennial World E-Government Rankings reports. The literature identifies a numeric evolution of e-government in the world in the form of increase in the implementation of online portals (one-stop-shop), ICT policies & strategy implementation, electronic services in education,

and investment in the infrastructures of communication [22]. According to the United Nations [23] there are wide disparities among countries: “*the high income countries are advanced in their provision of public information, online services, communications and outreach to citizens, and electronic access to government*” [37, 39-42]. Conversely, in many developing countries e-government initiatives are being carried out very slowly, as a result of problems related to a variety of factors such as lack of infrastructure, digital exclusion and poverty.

For the last six years, the world ranking has been led by the Republic of Korea or the United Kingdom. In 2016 Australia retains the second position while Republic of Korea fell to third. In 2016, all African countries were ranked below the 50th position. In the context of Africa, the status of the e-government development index in 2012 positioned the Seychelles in first, followed by Mauritius and Republic of South Africa. In 2014, Tunisia, Mauritians and Egypt took the podium. Mauritius reached the first position in 2016.

According to the United Nations [22], the key challenge for e-government development in Africa remains the widespread lack of infrastructure and functional literacy and the situation of Mozambique in the international ranking context is conditioned by those factors. In 2010, Mozambique appears in the 161st position in the global e-government development index (GDI). In 2012 the country ranked 158th due to the improvement of online services, which gained ground after the consolidation of all information into one site. It falls to 164th in 2014 while regaining positions in 2016, where it ranked 172. We believe these variations are due to the progress of many countries in systematizing services as a means of increasing efficiency. In neighbouring countries, Lesotho was ranked 154th, Malawi 166th, Zimbabwe 134th, Zambia 132sd, Tanzania 130 and South Africa 76th.

2.2. *Maturity models and the case of Mozambique*

It may be informative to situate Mozambique in the context of e-government evolution models [27] in order to assess online presence and interaction competence. Several maturity models have been proposed in the literature, such as the ones found in references [29] to [33] and summarized with the outline in Table 1.

The government of Mozambique developed some initiatives which may be related to the models described. From this point of view it seems difficult to situate the level of the country, insofar as some stages are under way and the first stage is not yet consolidated. The first stage consists of the dissemination of information through the Web, via electronic portals. The strategy for computerization included the implementation of government portals with the aim of informing citizens, created under the PES (Social Economy Program) in 2012 [28]¹. One of the activities was the creation of Web portals in districts linked to GovNET [28], though portals are not yet fully functional, lacking optimization to provincial and district levels. Portals do not have a permanent update and still lack information needed from outside districts and provinces, such as checking if requested citizen cards are ready to be collected.

In effect, with reference to the maturity model of Alhomod & Shafi [30], as to bidirectional interaction (citizen-government) in Mozambique this phase seems far from achieved. The e-BAU services [33], a single served online desk, which aims at offering various services, such as business companies licensing, is currently offering only reference information and is not yet able to resume any complete process. Moreover, in our point of view, portals should be enabled to be accessed by citizens without regard to the kind of device that the citizen holds to meet the demands of user devices and overcome the ubiquity barrier.

¹ <http://www.portaldogoverno.gov.mz/eng/Government/Ministerios>

² <http://www.portaldogoverno.gov.mz/por/Cidadao/Balcao-de-Atendimento-Unico>

In the third stage, with regard to complete transactions through the web, there are some solutions presented by some state institutions in conjunction with commercial banks and mobile telephones companies, namely: payment of water, purchase of light and some other services available with IZI Millennium BIM [34]. However, few exist that eventually do not require the physical presence of the user, such as mobile contribution from INSS (Instituto Nacional de Segurança Social) .

Table 1: Summary of Maturity Models

Model Author	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Alhomod & Shafi [29]	Presence on the Web	Interaction between citizen and government	Complete transaction over Web	Integration of service	N.A	N.A
Almazan & Gil-Garcia[30]	Presence	Information	Interaction	Transaction	Integration	Political participation
Layne & Lee[31]	Cataloguing	Transaction	Vertical integration	Horizontal integration	N.A	N.A
Wescott[32]	Setting up an email system and internal network	Enabling inter-organizational and public access to information	Allowing 2-way communication	Allowing exchange of value	Digital democracy	Joined-up government

There are very few examples of services in the fourth phase, as far as service integration is concerned. One example is the Common Communication Platform & Interoperability Framework, which provides horizontal government communication, allowing the government to link to a common communication platform, in order to share electronic resources and services.

Maturity models allow us to perceive in some extent the evolution of e-government. In our opinion, they still lack a dimension of analysis in the perspective of citizen needs. In general, from the point of view of access to information, the majority of users in Mozambique own mobile devices. Towards the evolution of services it would be important to develop websites and services accessible via web mobile, encouraging and awakening citizens to the use of electronic services. In the rest of the paper, we corroborate this thesis through a descriptive analysis of the situation in Mozambique, where the course of e-government in Mozambique since its inception, concrete difficulties, and suggestions for the future are described.

3. E-Government in Mozambique: past, present and current challenges

In Southern Africa there has been an effort to improve services by implementing e-government and promoting various initiatives such as: E-Administration, E-health, E-Card Registration, Mobile Banking, Payments Services, E-Voting etc. In this regard, Mozambique, being a country with approximately 26 million inhabitants and with the majority of the population living in rural areas (68%) [35], has not spared efforts to implement and disseminate e-government.

The Internet became a reality in 1992 through the contacts created at the time by CIUEM with the University of Rhodes, South Africa, that participated in events on how to work on the Internet and using email. These efforts culminated in the sending of the first

³ <http://m-contribuicao.inss.gov.mz:97/>

email from Maputo to the University of Rhodes, at 7pm on February 3rd, 1993, constituting the first steps towards electronic governance [36].

3.1. ICT spread and programs

Mozambique was one of the pioneer countries in Africa to recognize the importance of ICT for development and to contemplate policies in its governance programs for that purpose, known as computer policies. Some projects in operation or implementation include: a) Government portals, focused on providing and disseminating information, implemented in 2007; b) Provincial Centre of Digital Resources-CPRD, providing services and stimulation of ICT activities, implemented since 2003; c) Financial state management-E-SISTAFE, aiming at managing financial information, implemented in 2002-2004; d) GovNet (The Government Electronic Network); e) JUE-Electronic Single Window, a custom's service for the clearance of goods, initiated in 2012 and still under implementation to achieve full service [11]; f) E-BAU, for registration, licensing and business facilitation, in implementation since 2014 [37]; g) MoReNet-Integration of higher education, in implementation since 2006 [38, 39]; and h) SchoolNet, which introduced computers in schools for secondary levels, implemented since 1997 [33].

3.2. Main actors in the introduction of ICT and e-government

Mozambique has decided to undertake multiple e-government initiatives to support development. Since 1976, the Ministry of Transport and Communications was responsible for designing and managing the telecommunications infrastructure that was initiated at that time. All actors have been important, but the umbrellas of all initiatives are the Technical Unit for the implementation of the policy of Informatics (UTICT), the Ministry of Science and Technology (MCT), the Ministry of Transport and Communications (MTC), the Commission Policy of Informatics (CPI), the National Communications Institute of Mozambique (INCM), the Technical Unit of reform for the financial administration of the state (UTRAFE), Eduardo Mondlane University Computing Centre (CIUEM), and the National Institute of Information and Communication Technology (INTIC).

3.3. The Computer Policy

The computer policy was approved under the Resolution No. 28/2000 of December 12, 2000 of the Council of Ministers and had as mission:

- a) To contribute to the fight against poverty and to improve living conditions of Mozambicans;
- b) To ensure citizens' access to the benefits of the world of knowledge;
- c) Elevate the effectiveness and efficiency of state institutions and public utilities in the provision of their services;
- d) Improve governance and public administration.

This policy identifies some areas for action to achieve the purposes of its mission, namely education, human resources development, health, universal access, infrastructure and governance [43, 44]. Following this policy, a strategy was outlined aiming at implementing the computer policy, which was approved in 2002. The policy has resulted in initiatives such as the electronic transaction policy approved in 2017 [41], the opening of the market for ICT investors, and the provision of a system for healthcare management, finance, agriculture, and data collection.

3.4. The E-Government strategy in Mozambique

A national ICT policy was created to generate the strategy of e-governance in Mozambique, approved in 2006, whose specific objective was to support the third phase of the reform of the public sector, with the aim of promoting decentralisation, improving the quality of

services, and enhancing institutional and human capacities, scheduled for the period 1990-2011 [42, 43]. Since then, some of the objectives have already been achieved.

The strategy implementation highlights are:

- 1 Telecentres, a project approved by the Mozambique's Acácio Advisory Committee (MAAC), inserted in the strategy for the expansion of ICT in rural environments;
- 2 SchoolNet: a project aimed to promote access to ICTs and to create a culture of ICT integration in the teaching-learning process;
- 3 Government Electronic Network (GovNet): the key to the implementation of the e-government strategy, launched in 2004 as a physical platform for communication and data exchange between the government and government institutions [41,45].

3.5. *Challenges in the Implementation of e-Government*

The effective implementation of e-government in Mozambique entails challenges like: ICT infrastructure, regulatory policies, shortage of qualified personnel, economic issues, security and privacy, digital division, culture and political will [44]. From a more detailed perspective, the issues and respective measures for improvement include the following:

- a) *Electrification of the rural areas of Mozambique.* Electricity plays a key role in the expansion of ICT in Mozambique. Mozambican electricity network was drastically damaged in the wake of the Civil war, between the years 1977-1992 [45, 36]. In its five-year programme for the period of 2005-2009, the government made a commitment for enabling the viability of ICTs and for the electrification of the country. This objective became a reality in 2013: districts with 24 hours a day electric lighting raised from 47 to 120 districts [36].
- b) *The price of calls and the Internet.* One of the strategies for dissemination of services is price reduction. With the introduction of the prepaid model in 1998, the number of subscribers grew. After the emergence of a new operator company – Movitel – that offered the lowest price on the market, as well as its direct competitor – Vodacom – prices have fallen significantly.
- c) *Fibre Optic Extension.* Fibre optic extension to rural areas increased to 70% and the corresponding increase of Internet users went from 1% in 2009 to more than 7.47% of the population in 2015, which continues to increase.
- d) *Expansion of the mobile network to rural areas.* With the arrival of Movitel, there was a massive extension of the mobile telephonic network to rural areas, reaching more than 22,500 km of fibre optics at national level [35].
- e) *The registration of SIM cards and the situation of mobile phones in Mozambique.* The idea of registering cards in Mozambique was introduced through the Ministerial Decree No 153/2010. The number of subscribers in 2016 reached more than 19 million [44, 46, 49].

From the point of view of physical infrastructures, improvements can be expected to emerge in medium to long-term time windows. But from short to long-term views, the dramatic increase in the number of mobile phone users offers promising directions for evolution, which we believe should be explored.

4. **Prospects for the future**

Information and communication technologies have become a daily part of life and most, if not all, areas of human development call for an increasing usage and mediation through ICTs. In the context of the development of e-government, Mozambique has shown very positive signs but still faces several challenges and limitations.

As we mentioned earlier, the initiatives have not yet covered the entire targeted population. We believe this can be improved with the provision of an electronic mobile web

service and an open data portal designed from a citizen centric view, thus improving citizen participation and government transparency. According to the United Nations [22], all the 193 member states of the United Nations had national portals in 2014. In Mozambique, the governmental portal was developed with four main stakeholders in mind: the citizen, the private sector, civil society, and public servants [47]. However, some web portals do not meet the needs of the target population since the motivation of available services and usability requirements were not adequately considered, resulting in significantly lower audience.

According to IDEA [48] only 20% of the families in rural areas have cell phones, with this figure rising to 67% in urban areas. On the other hand, the tendency of citizens to adhere mobile telephone services is noticeable, with the total number of subscriptions rising and reaching approximately 18 million in 2015 [35]. In Mozambique there is a gap related to the use of the technology itself. On the one hand, people use technologies to communicate using voice calls, SMS, and navigate in internet, mostly for social networking. In fact, five million citizens with internet access have an account on Facebook [49]. Nevertheless, few citizens use web technologies for electronic transactions. This contrasts with the fact that many services available online are accessible via computers connected to the Internet. In effect, most of the Mozambicans do not have personal computers. In 2015, only 80 thousand people had a fixed phone, contrasting with approximately 18 million mobile phone subscribers.

The present technological context offers a serious chance for the government to improve the maturity of e-government and strive forward for more ambitious goals. We believe this can be achieved by implementing a hybrid infrastructure of electronic services, accessible both via computer and via mobile devices.

References

- [1] K. J. Bwalya and M. Healy, "Harnessing e-Government Adoption in the SADC Region : a Conceptual Underpinning," vol. 8, no. 1, pp. 23–32, 2010.
- [2] S. S. Dawes, "The Evolution and Continuing Challenges of E-Governance," 2008.
- [3] Y. Lopez, *Sistemas de Informação para Gestão*. Lisboa, 2013.
- [4] A. Ducass, "E-Gov Development in Africa," vol. 15, no. 2, pp. 59–62, 2016.
- [5] D. Lupu and C. Georgiana, "Influence of e-government on the level of corruption in some EU and non-EU states," vol. 20, no. 15, pp. 365–371, 2015.
- [6] F. Makoza, "The Level of e-Government Implementation : Case of Malawi," vol. 11, no. 2, pp. 268–279, 2013.
- [7] J. J. Yonazi, "Exploring Facilitators and Challenges Facing ICT4D in Tanzania," vol. 2012, 2012.
- [8] Y. Jadi and L. Jie, "Implementation Strategy of E-government System for Emerging Countries," vol. 8, no. 2, pp. 1037–1043, 2015.
- [9] A. Rorissa and D. Demissie, "An analysis of African e-Government service websites," *Gov. Inf. Q.*, no. 2010, 2002.
- [10] G. Moçambique, "Início - Portal do Governo de Moçambique." [Online]. Available: <http://www.portaldogoverno.gov.mz/>. [Accessed: 07-Mar-2018].
- [11] W. Claypole, "Impactos da janela única electrónica em moçambique," 2013.
- [12] E. Commission, "Framework for a set of e-government core indicators," 2012.
- [13] Q. N. Nkohkwo and M. S. Islam, "Challenges to the Successful Implementation of e-Government Initiatives in Sub-Saharan Africa : A Literature Review Research methodology," vol. 11, no. 2, pp. 253–267, 2013.
- [14] D. de S. Soares and L. Amaral, "E-Government Concept: A Holistic and Eclectic Framework," in *Public Affairs and Administration: Concepts, Methodologies, tools and Applications*, IGI Global, Ed. 2015, p. 29.
- [15] S. F. H. Zaidi and M. K. Qteishat, "ASSESSING E-GOVERNMENT SERVICE DELIVERY (GOVERNMENT TO CITIZEN) Syed Faizan Hussain Zaidi," *Of. Int. J. Vol. Gov. Stud.*, vol. 4, no. 1, pp. 45–54, 2012.
- [16] E. E. O. Chukwuemeka, E. I. Ubochi, and E. U. Okechukwu, "Review of Public Administration and Management Effect of E-Government on Service Delivery in Federal University Ndufu- alike Ikwo ,

- Ebodnyi State,” vol. 5, no. 1, pp. 1–8, 2017.
- [17] M. Hussein and O. T. Pusatli, “A preliminary work on investigating UN E-government criteria in Middle East Countries,” vol. 9, no. 2, pp. 51–71, 2017.
- [18] S. Adapa, “E-Services Efficiency of Government Organisations in Asia,” 2013.
- [19] T. Schuppan, “E-Government in developing countries : Experiences from sub-Saharan Africa,” *Gov. Inf. Q.*, vol. 26, no. 1, pp. 118–127, 2009.
- [20] S. J. Palvia and S. Sharma, “E-Government and E-Governance: Definitions/Domain Framework and Status around the World,” *Comput. Soc. India*, 2007.
- [21] M. Associação, Bancos, “Banca móvel acelera inclusão financeira em Moçambique,” 2017. [Online]. Available: <http://www.amb.co.mz/index.php/notas-de-imoprensa/notas-de-imprensa/320-banca-movel-acelera-inclusao-financiera-em-mocambique>. [Accessed: 24-Jan-2018].
- [22] U. Nations, *E-GOVERNMENT SURVEY 2016*. 2016.
- [23] U. Nations, “UNITED NATIONS GLOBAL E-GOVERNMENT READINESS REPORT 2004,” 2004.
- [24] U. Nations, *E-Government Survey 2010*. 2010.
- [25] U. Nations, *United Nations E-Government Survey 2010*. 2010.
- [26] U. Nations, *E-Government Survey 2012*. 2012.
- [27] R. Kerby, “e - Government Survey UN E- E - Government Survey,” 2014.
- [28] INTIC, “Relatorio de Actividades 2012,” 2012.
- [29] S. M. Alhomod and M. M. Shafi, “Best Practices in E government : A review of Some Innovative Models Proposed in Different Countries,” *Int. J. Electr. Comput. Sci. IJECS-IJENS*, vol. 12, no. 1, pp. 1–5, 2012.
- [30] R. S. Almazán and J. R. Gil-garcía, “E-Government Portals in Mexico 1,” no. 2000, pp. 2006–2008, 2006.
- [31] K. Layne and J. Lee, “Developing fully functional E-government : A four stage model,” *Gov. Inf. Q.*, vol. 18, pp. 122–136, 2001.
- [32] C. G. Wescott, “E-Government in the Asia-Pacific Region,” *Asian Dev. Bank*, 2001.
- [33] G. Macueve, L. neve. C. Domingos, and F. Mabila, “Inclusão digital em Mocambique: um desafio para todos,” 2009.
- [34] M. BIM, “IZI-Millennium BIM,” *Web*, 2015. [Online]. Available: <http://ind.millenniumbim.co.mz/pt/public/Mobile/Paginas/IZI.aspx>. [Accessed: 19-Jun-2015].
- [35] L. Chemane, “Resultados e Impacto do Projecto de Governo Electrónico e de infra-estruturas de comunicação,” 2016.
- [36] R. Matusse, *História da Informática em Moçambique*, CIEDIMA. Maputo, 2013.
- [37] FMI, “Moçambique : Carta de Intenções.” 2014.
- [38] G. Alan and G. Sadowsky, “A country ICT survey for Mozambique,” 2006.
- [39] S. A. Timbane, M. Axt, and E. Alves, “O Celular na Escola: Vilão ou Aliado!,” *Nuevas Ideas en Informática Educ. TISE*, vol. i, no. Tise, pp. 768–773, 2015.
- [40] C. para a P. de Informatica, “Rumo à Sociedade Global de Informação,” *Salomão Manhiça*, p. 74, 2002.
- [41] Assembleia_Republica, “Lei de transacoes Electronicas em Mocambique,” 2017.
- [42] A. Dias and M. M. K. Pinheiro, “Politica de Governo Electronico em Mocambique: um olhar na perspectiva de uma cultura de informacao,” vol. 17, no. 1, p. 60, 2012.
- [43] F. Mabila, “what is happening in ICT in Mozambique,” 2013.
- [44] M. Alshehri and S. Drew, “E-GOVERNMENT FUNDAMENTALS,” no. 2001, pp. 35–42, 2010.
- [45] UTICT, “E-Government Interoperability Framework for Mozambique,” Maputo, 2010.
- [46] INCM (Instituto de comunicações de Moçambique), “2016,” 2016. [Online]. Available: <http://www.incm.gov.mz/439>. [Accessed: 18-Mar-2018].
- [47] V. Cumbi and L. Chemane, “Mozambican Government Portal Case Study : Visitor Analysis,” pp. 1–10, 2011.
- [48] IDEA, “Cartaz de Dados sobre a População . Moçambique , 2013,” p. 2013, 2013.
- [49] Internet World Stats, “Acesso a internet e facebook,” 2017. [Online]. Available: <http://www.internetworldstats.com>. [Accessed: 30-Jun-2017].