

Lessons Learned from Korean m-Government - Part II: Services

Yoseph Abate¹, Dr. Manjunath Gadiparthi²

(Dr. P.G.V Suresh Kumar, Lisanum Tebikew, In Soo Hwang, Yoseph Berhanu)

¹ Center of Information Technology and Scientific Computing, Addis Ababa University, Addis Ababa, 385, Ethiopia.

² Center of Information Technology and Scientific Computing, Addis Ababa, 385, Ethiopia.

Abstract: In developing countries people use mobile phones as the main computation device and hence the realization of m-Government will become a necessity rather than an option when e-Government services are deployed. Like many developing countries, Ethiopia could benefit from m-Government solutions that are quickly emerging as the new frontier of service delivery, and transforming Government by making public services more accessible to its citizens. Many service models are appearing with the particular scenarios for each nation, and Ethiopia also needs a unique model encompassing its current e-Government development level, cultural and technological environment. At present we portrayed the lessons learned from Korean mobile-based extensions of its existing successful e-Government services. In the analysis, we showed the practical reasons for the dimension of its mobile implementation as compared to its desktop applications services. The best practices of Korean m-Government services include Government Integrated Data Center, Electronic Customs Clearance Systems and National Education Information Systems. We also depicted how Ethiopia can realize such mobile based services and indicated the appropriate areas where such implementations are advisable. Finally, we suggested the best practices in creating the right skill in the software developers and IT community for the realization of e-Government with the accentuation of m-Government solutions.

Key words- e-Government survey, m-Government, Service, e-Government/m-Government Framework, mobile app

I. OBJECTIVE

The objective of this paper is to explore the concept of m-Government (mobile government). The mobile phone growth is increasing day by day. The social and economic implications of m-Government are becoming vital. According to the review of literature, the growth of mobile phone subscriptions reached with an access rate of 83% globally at the end of 2013, which has triggered us to pay more attention for the implication of m-Government in Ethiopia. For the faster adaptation of mobile technology among Ethiopians, wider coverage of remote places with cheaper and easily accessible mobile services is very much essential.

II. RESEARCH MOTIVATION

In modern live-out we can use digital channels to deliver better quality services to the citizens of Ethiopia on mobile platforms with m-Government, an

extension of e-Government. Many other countries like Korea, Japan and America, Ethiopia should start incorporating mobile dimensions into its digital governance frameworks. Our study notifies the approaches and methodologies aiming at assessing the importance of different attributes of service content for the entire population of Ethiopia and the service preferences revealed (from Korean m-Government) will render determination of the attributes and services that are attractive to users and elimination of the ones that are not and thus, the study aims at restructuring a package of services and increasing the consumer value by encouraging the widespread use of technologies.

III. INTRODUCTION

Mobile devices are making the world go round. The advancement in mobile technology is instrumental in enhancing the relationship between Governments and citizens through mobile phones. The m-Government, is the extension of e-Government to mobile platforms aimed at motivating Government agencies and citizens to help disseminate information, mobilize resources and synergize efforts with innovative solutions in the field of smart phone applications, mobile websites and short message services. Mobile Government, as the term connotes, aims to bring mobility to e-Government processes. m-Government is a combination of the two concepts: e-Government and mobility. The general notion of the term is to make use of mobile technologies in order to enhance existing e- Government procedures and services. The m- Government system is integrated with a mobile application, which is so designed to include governmental services and information flow from anywhere at any time through a mobile platform for improving benefits to the parties involved in e - Government including citizens, businesses and governmental units including cost reduction, efficiency, transformation/modernization of public sector organizations, added convenience and flexibility, better services to the citizens and ability to reach a larger number of people through mobile devices than would be possible using wired internet only. These benefits can be enriched and analyzed under three categories: benefits to the government, citizens and the industry. The use of mobile technologies and applications differentiates m-Government from any other developments in the public sector using new

technologies, including e- Government. Based on various studies on mobile governance applications, a number of differentiating dimensions can be identified such as better precision and personalization in targeting users and in delivering content, more convenient accessibility and availability, and a larger and wider user base.

IV. METHODOLOGY

Mobile phones can reach those areas where the infrastructure necessary for Internet services or wired phone services is difficult to set up. In the developing countries mobile government applications may become a key method for reaching citizens in far and wide areas and promoting exchange of communication. In such countries with insufficient conventional telecom infrastructures and stable acceptance of mobile phones, the ability of reaching rural areas may be considered as an important feature of m-Government.

Low Cost: Mobile phones are a relatively low cost technology as compared to conventional Internet technology.

Ease of Learning: Usage of mobile devices is fairly simple thus making it easy for any common person to use it and access information.

e-Development: Helps in expanding the scope of e-governance in the areas like e-Democracy, e-Participation, e-Voting and many others formats of communication between the citizens and the Government.

Enhanced Network: A wide range of Government services can be delivered via mobile networks. According to an estimate by Dr. Debrezion Gebremichael, Minister of Communication and Information Technology, Ethiopia has reached over 18 million Subscribed mobile phone users and is aimed to reach 45 million subscribers by the end of 2014. He also noted that wireless technology coverage of the country had now reached 73%, mobile penetration is rising and the sector continues to benefit from the poor fixed-line infrastructure which has promoted mobile alternatives as the only viable form of communication.

Table 1. Market Penetration Rate In Ethiopia's Telecom Sector By End Of 2013

Market	Penetration Rate
Mobile	25%
Fixed	0.9%
Internet	1.2%

According to the United Nations e-Government survey 2010 the e-Participation index of Ethiopia is 0.0429 where as the Korea is 1.000. Ethiopia ranks 135th place out of 157.

Wide availability of mobile phones' technical knowledge: The use of Internet requires a fairly complex set of skills and technology know how's. There are certain requirements such as electricity, communication lines, and computer workstation and in most cases a reasonable fluency in English. These requirements are difficult to be met in many e-Government applications, cannot be implemented and if implemented they fail to succeed and meet their objective.

ICT Accessibility: The people's readiness to accept ICT and Internet regularly is high in developed Countries as compared to developing countries. People in many developing countries are unable to access ICT with sufficient regularity and in some places they are unable to access it at all. On the other hand mobile government applications are accessed using devices such as mobile phones, which have an added advantage of ease of use, low cost etc.

Easy Infrastructure Setup: Due to the simple architecture of mobile telephones, new mobile phone networks can be easily installed in Ethiopia and that too without much economic constraint.

4G Services: ethioTelecom (ETC) has a full monopoly on all telecom services including fixed, mobile, Internet and data communication in Ethiopia. The country's broadband network is also set for a boom following massive improvements in international bandwidth. The ethioTelecom and ZTE had been stuck to strengthen local connectivity services nationally by implementing a high-speed 4G network by Huawei technologies as a key component to expand mobile phone infrastructure and also these services promise to make more information available at faster speeds, which is of avail to our proposed model.

Improvement on e-government effort: Mobile-Government is not a replacement to e-Government but complementary to it.

Achievements through m-Government: Enabling G2C, C2G, and G2E communications, mobile technologies prove to be an important medium for government to timely deliver information to its citizens. Termed as Government to Citizen (G2C) for instance, the Government in Korea has provision for sending short messaging services (SMS) to all registered bus and taxi drivers to help the police in searching and tracing missing citizens and criminals. Similar applications exist to assist Citizen to Government (C2G) and Government to Employee (G2E) services. In Korea, citizens via SMS with their specific code can complete the entire tax declaration procedure (C2G) and also mobile law enforcement units query vehicle information using

mobile devices in their cars. Vehicle information is then crosschecked with several government agencies for road tax enquires, criminal suspicion or owner's identification (G2E).

m-Democracy and m-Voting: Public opinions can be expressed via SMS, email, WAP (G2E) and web forms. m-Voting has been partly introduced in certain countries in the form of information mechanism to subscribed citizens about their polling booths and subsequent SMS regarding the poll results (implemented in Virginia, USA).

Efficient ROI: On the spot data gathering and immediate upload into one central database is one of the remarkable features of the m-Governance providing substantial cost savings and Return of Investment (ROI). Thus, mobile technologies can help Government officials to better manage the allocated financial and human resources.

Location Based Services (LBS): These have been mainly used for commercial and advertising purposes but have substantial applications with regard to emergency services such as locating a nearby Bank/ATM service, information regarding traffic conditions, weather forecasting, news headlines and alerts.

Handling Transportation through m-Government: Certain Governments have employed various services to help provision increased safety on roads. This may involve usage of Global Positioning System (GPS), Location Based Services (LBS) and Interactive Voice Response (IVR) technologies and involve information regarding any road accidents in all vicinities, congestion management, alternative routes, repair services, remote diagnostic of broken vehicles, reporting dangerous driving through voice commands (operational in Korea trucks) etc.

Education and m-Government: m-Technology enhances parent- teacher communications, with regard to the ward's progress and other regular notifications. ICT as part of student's curricula trains them for the future work environment and Wi-Fi enabled campuses, stimulate the utilization of wireless devices and notebooks by university students.

m-Health: Online consultations, SMS alerts to blood donors in case of need of a rare blood Group, financial help regarding an expensive treatment etc. are already a reality. The day is not far when even virtual operations would be possible where a specialist sitting in his chamber in a remote location monitors (via video conferencing) would advise his junior in emergency operations or situations. Our m-Government Framework model comprises of different types of mobile devices interacting to main m-Government web services, other global web services with central database of contents controlled by central web management consol. The purpose of the framework model is to ensure the visions and objectives of the m-Government initiative in the area of mobile communications. Being able to clearly identify the set

of involved actors, their objectives and the way they depend on each other in order to achieve such goals, a comprehend organizational setup has to be introduced. The modeling is a very difficult task due to the high complexity in m-Government applications; the proposed framework model of ours will give the overview of m-Government in the above figure.

V. CHALLENGES

In spite of all benefits and advantages discussed so far, there exist challenges, which need to be handled by m -Government.

A. Infrastructure: It refers to the existence of the hardware and software. The hardware part already exists but only limited software is available for m-Government implementation, suggesting a requirement for new software to work with the latest technologies. The physical infrastructure exists for both wired and wireless networks in the urban areas but in rural areas the wireless infrastructure is still in its infancy.

B. Privacy and Security: Associated with any wireless or mobile technology are the privacy and security concerns. Citizens want that the government agencies should safeguard their key-data from moving into the hands of unauthorized agencies or hackers, thus preventing its misuse by taking special note in selecting appropriate mobile devices, thus ensuring privacy and security.

C. Peoples Readiness: One of the most important pre-requisite for m-Government is the citizens' acceptability and attitude towards it. For instance like Ethiopia and some other developing countries, a large percentage of the population is not aware of the meaning and impact of e-Government and m-Government, thus stressing on training and education the people is required successfully carry out mobile transactions via mobile technologies.

D. Compatibility: Mobile services, as communication channel between the authority and the citizen requires global standardization of content, semantics and interoperability across agencies and network. The large array of new communication technology opportunities, the rapid emergence and change of standards as well as a variety of mobile devices offering different technical capabilities call for substantial architecture and technology frameworks in order to meet critical interoperability and scalability requirements in Ethiopia.

VI. FUTURE OF M-GOVERNMENT

The Future of the m- Government throughout the world seems extremely bright and the changes are welcome. Efforts are on towards converting many government services from e -Services to m-Services, as mobile devices move in to the hands of almost every individual. Though the success rate of e-Governance in Ethiopia is not satisfactory, the pattern of moving from e- Service to m- Service is inevitable.

It seems a lot easier when trying to contact people for personal or official reasons. However, along with the positive trends there are some problems and bindings on the society and the administration. A large population equipped with mobile connections puts strain on the existing infrastructure and stresses its development. Bandwidth issues, connectivity issues, roaming rentals, advent of new and improved mobile technologies require focus not only by the providers but need simultaneous involvement and considerations by the government. The need of m-Services also makes it inevitable for the e-Government professionals, practitioners, and researchers to acquire necessary skills to face the new move towards the m-Government in Ethiopia. Thus the future seems bright but requires tremendous improvement of the technical expertise, infrastructure, socio-economic acceptance, security and privacy considerations.

VII. CONCLUSION

Analyzing the requirements of the public and the lessons learned from the Korean m-Government, our study shows that the m-Government model focuses on public service delivery, implementation frameworks, historical evolution, challenges and measuring the effectiveness of mobile based services and in parallel the citizens should be carefully educated in order to feel comfortable with m-Government. It involves public campaign and benefits that the citizens can clearly see and understand. When implementing new technologies, Governments should not force citizens to upgrade their current devices, but rather use the applications using current technologies and current bandwidth for data transfers or services. Starting small, but thinking big – basic m-Government applications should be cornerstones of wireless strategies for the Ethiopian Government. On the other hand, such systems should be open to handle new technologies and the strategy should have a clear, long-term vision for the provision of the service and information relating to it. The Government should prepare a complex strategy in close cooperation with the public and private sectors. The implementation solution as discussed above is based on interoperability, security, openness, flexibility, and scalability. We feel that with the adoption of next-gen mobile services by the service providers in Ethiopia and development of contents (especially local) for mobile platforms by administrative agencies and developers, the government can start providing more effective services at low cost. It is expected that the proposed m-Government model shall be implemented in Ethiopia within a couple of years for the better services to the citizens.

References

- [1] Alavi, M., and Krisper, M. (2005), 'Knowledge management systems: issues, challenges, and benefits', *Communications of the Association for Information Systems*, 1, (7), 2-41.
- [2] W'O Okot-Uma, R. (2001), 'Electronic Governance: Re-inventing Good Governance'.
- [3] Hall, R., and Andriani, P. (2003), 'Managing Knowledge associated with innovation', *Journal of Business Research*, 146, (56), 145-152.
- [4] Beynon-Davies, P. (2004), 'Constructing electronic government: the case of the UK Inland Revenue', *Proceedings of the European Conference on Information Systems (ECIS 2004)*, Finland.
- [5] Ovum (2003): Mobile E-commerce – Market Strategies, *Ovum Press Release*.
- [6] Stracke, J. (2002), 'E-government: supporting knowledge and information flows with supply chain management', *Proceedings of 3rd Working Conference on Knowledge Management in Electronic Government*, Copenhagen, Denmark.
- [7] Rubenstein-Montano, B., Buchwalter, J., and Liewbowitz, J. (2004), 'Knowledge management: A U.S. Social Security Administration case study', *Government Information Quarterly*, 18, (3) 223-253.
- [8] AFIRM (2002), 'A Blueprint for Successful E-government Implementation: Steps to accelerate cultural change and overcome stakeholder resistance', *Association for Federal Information Resources Management*.
- [9] Burlton, R. T., (2001), 'Business process management: Profiting from process', *Indianapolis: SAMS Publishing*.
- [10] Palkovits, S., Woitsch, R. and Karagiannis, D. (2003), 'Process-based knowledge management and modeling in e-government – an inevitable combination', *Proceedings of 4th Working Conference on Knowledge Management in Electronic Government*, Rhodes Island, Greece.
- [11] Ibrahim Kushchu. (2003) 'From E-government to M-government: Facing the Inevitable', *Proceeding of 3rd European Conference on e-Government*, pp.252-261.
- [12] Luling, D. (2001), 'Taking it online: anyway, anyplace, anytime...Tennessee anytime', *Journal of Government Financial Management*, Vol.50, pp. 42-49.
- [13] MForma (2005), 'Mobile Entertainment Industry Fact Sheet'.
- [14] Gupta M.P, Debashish Jana. (2003) 'E-government evaluation: A framework and case study', *Government Information Quarterly* 20, pp. 365-387.
- [15] IOS Press and the authors. (2005) 'European M-Government Project Launch Pilot Services', *E-Commerce Developments, Digest of Electronic Commerce Policy and Regulation* 28, pp. 221-222.
- [16] Pardo, T. (2000), 'Realizing the Promise of Digital

Government: It's more than building a Web Site',
IMP Magazine.

- [17] Liebowitz, J. (2004), 'Will knowledge management work in the government?', *Electronic Government*, Vol. 1, pp.1-7.
- [18] Malhotra, Y. (2000), 'Knowledge Management for e-business performance', *Information Strategy: The Executives Journal*, Vol. 16, No. 4, pp. 5-16.
- [19] Wagaki Mwangi. (2006) 'The Social Relations of e-Government Diffusion in Development Countries: The Case of Rwanda', *Proceedings of the 2006 International Conference on Digital Government Research, San Diego, California; ACM International Conference Proceedings Series*; Vol. 151, pp. 199-208.
- [20] Metaxiotis, K. and Psarras, J. (2005) 'A conceptual analysis of knowledge management in e-government', *Electronic Government*, Vol. 2, No.1, pp. 77-86.