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Establishing Model of Mobile Government Services at Saudi Arabia

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Abstract: Mobile technology is considered to be a delivery channel for many organizations around the world. This paper contributes to an understanding of the issues related to the implementation of mobile government services in Saudi Arabia. There is a lack of research and publications looking into m-government services. The few studies that are available focus on the introduction of mobile servicers when the technology was in the first stage of implementation. In 2005, Saudi's mobile government services began with the introduction of an SMS service for citizens' requests. By 2015, the Saudi mobile government services had advanced through the informational level to the interactional level and had reached the transactional level. This paper investigates the available literature relevant to m-government services in Saudi Arabia, provides an outline of the maturity models of m-government services, and ranks m-government services in Saudi Arabia within the stage model to evaluate and compare the degrees of improvement.

Keywords: M-government, mobile services, maturity model, Saudi Arabia.

1. INTRODUCTION

Aftershock of the economic instability, better became essential for the government to provide good public services by utilizing fewer resources. The strategy ensures the better way for the Government to engage with public. For the next generation public services, the utilization of modern mobile technologies could provide a good opportunity for government as the technology has open specifications with grater sharing, reusability, interoperability, and accountability of future market trends.

Electronic government refers to the uses of ICT for transferring and delivering services and activities to different parties, such as: Government to Government (G2G), Government to Citizens (G2C), Government to Employee (G2E), and Government to Business (G2B) (Al-Yhunibat *et al.,* 2011). The concept of M-government is regarded as as a subset of E-government. The function of this M-government is to use mobile devices to provide government services and deliver information to citizens, organizations, and employees (Anltivoiko, 2008). M-government refers to the application of wireless communication and mobile computing in government, that offer services for the public via mobile phone (Wei *et al.,* 2010). M-government is defined as a "strategy and its implementation involves the utilization of wireless and mobile technologies, services, applications and devices for improving benefits to the parties involved in e-government for citizens, businesses and all government units" (Kushchu and Kuscu, 2004).

Two general phases are implemented in M-government to develop the strategies in providing services. In the first phase, data which are available in computer based applications, are provided through mobile devices. In the second phase, the services which are compatible for wireless and mobile transfer, are provided Both types are available within Saudi Arabia's m-government system, but have not yet formulated.

Maturity models are designed with a set of criteria, features, competencies, capabilities, and sophistication. The maturity models have been developed to assist organizations to evaluate and compare their improvements (Alssbaiheen and Love, 2015). The maturity models can benefit governments in three main areas. First, the models can help government to develop a long-tem plan. Second, they can help employees in understanding the government activities. Third, they can help citizens to understand the government services (Al-Hujran, 2012). Furthermore, they can help the government to enhance the capabilities of their services to better meet citizens' needs.

This paper firstly investigates the existing m-government services in the Saudi Arabia context. Second, a brief overview of the maturity models is

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provided in relation to their usefulness in evaluating m-government services. Lastly, the Saudi m-government services are ranked based on the maturity models.

2. BACKGROUND

As been recommended by the Organisation for Economic Co-operation and Development OECD, (2013) there is two main e-government policies to develop m-government services are enabling the technology transformation, and encouraging best practice for going mobile.

- Enabling the technology transformation

If a government is interested to implement M-government, it needs to ensure the availability of mobile devices and tools widely so that public agencies are able to adopt the technology to propel the ecosystem of application developer and service provider (Alssbaiheen and Love, 2015). In this case, government should ensure the coverage of targeted geographies and population (OECD, 2013).

The usages of the technology also need to be adopted by the public agencies. For most of the countries, the adoption of this technology is likely to involve in removing the technological gaps, increasing human capacity, overcoming political resistance, and ensuring financial sustainability. In many developing countries, governments are not able to provide facilities for mobile application development by their own, which makes the situation critical to work with partners in private or non-profit sectors. Though M-government achieves wide acceptance, increasing institutional capacity still raise the matter about the increasing demand of good governance and its respective services (IFAC and CIPFA, 2014).

For greater transparency and accountability of data transformation, government needs to pay attention for re-engineering process, creating facilities, and re-forming institutions. The risk of M-government is that, unsuccessful implementation of the concept will lose the trust of citizens in practicing the M-government's programs and policies. This risk prolongs not only to the proposed programs for making the governance transparent but also to the technologies that supposed to use for improving quality of services by waiting times reduction and process simplification.

- Emerging best practices for going mobile

Governments could encourage technical growth and advance institutional capability by allowing a sustainable technological revolution: first; enabling by constructing a strategy for m-government that make technology accessible and affordable. Second; strengthening the institutional capability to respond by enable share responsibility in service deliverance, promote efficiencies in process and in resource allocation and , built trust between government and citizens, involve user in design and evaluation.

- M-government overview

Electronic government has become a relatively mainstream initiative for the three-pronged objectives to deliver better services to citizens, encourage private economy as well as private-public partnership or all levels of inter enterprise capabilities, and reinforce the inter and intra administrative along with the government wise processes (Rannu *et al.,* 2010., Rossel *et al.,* 2006).

As a result, m-government offers unique opportunities through freedom of mobile access to services and information from any place at any time (Hellstrom, 2007). Mobile government initiatives can rebuild trust between government and citizens through faster interactions with a higher level of immediacy, convenience and effective service delivery (Thunibat *et al.,* 2010).

However, M-government, like any other technology, has numerous challenges that could limit the implementation of m-government services in broad areas. One of these challenges is the lack of mobile government laws because many policies and rules are applicable to the use of mobile technologies, particularly in the transaction phases. These challenges are also including authentication and validity, integration of technology for mobile access to government services (Maranny, 2011) and technical challenges such as interface design, screen size, and the capability-government set of devices (Misuraca, 2009). Problems arise when the interface design is changed, the memory is limited, or the information conveyed is significantly large (Abramowicz *et al.,* 2006). The degree of awareness among users (Thunibat *et al.,* 2010), privacy concerns, and security issues of using mobile devices are other challenges to achieving users' trust, especially the assurance that the information exchanged will not be sold to third parties (Chatzintas *et al.,* 2007; Kushchu and Kuscu, 2004).

When considering these challenges, it's important to note that the mobile government implementation is still in its early stage (Abramowicz *et al.,* 2006; Naqvi and Al-shihi, 2009; Thunibat *et al.,* 2010). The perfect m-government service and application has not yet been produced (Thunibat *et al.,* 2010). A mobile communication channel should be used that will be beneficial within a high quality information framework (Abramowicz *et al.,* 2006).

M-government in Saudi Arabia

In the Saudi Arabian context, electronic services were introduced in early 2003 with the aim to create an

overall strategy for converting traditional government services to electronic platforms and widely adopting an IT infrastructure plan. In 2005, the strategic plan for an e-government in Saudi Arabia, called "YESSER", promised that "by the end of 2010, everyone in the kingdom will be able to enjoy from anywhere and at anytime world-class government services offered in a seamless, user-friendly and secure way by utilizing a variety of electronic means". Furthermore, within the same year there was the establishment of m-government by sending SMS messages in response to citizens' requests, such as high school exam results requested from the Ministry of Education.

According to the Information and Communication Commission in Saudi Arabia, the number of subscriptions to mobile services reached approximately 56.1 million by 2011. This is a penetration rate of about 198% of mobile communications services at the population level. With regard to the Internet, the Internet penetration rate in recent years rose from 5% in 2001 to about 46% in 2011. The estimated number of Internet users in Saudi Arabia is currently about 13 million users.

As a result, the fast growing use of mobile phones among Saudi citizens led to the government decision to use this channel more actively to deliver services and information. Many government ministries and departments have begun to use mobile technology for their services. Some are using advanced levels while some are just starting. **(Table 1)** provides an overall summary of the m-government services in Saudi Arabia.

Table 1: M-Government Services Found in Saudi Arabia (Example)

Services description	Type of services	Authority
Users send SMS to activate the service or request it	Exchanging messages	Saudi Telecom
Users can access the web using mobile navigation to get simple information about the Ministry	Mobile navigation	Ministry of Civil Services
Users can request and update information about a bill or services via SMS	Exchanging messages	Ministry of Water and Electricity
1. Users can access the website via mobile to get simple information. 2. The Ministry provides a mobile health service to get updated information about new health issues based on a user registration system in which the user is charged. 3. The Ministry provides a general application for all health sectors in the country; users need to download it and can access it for free	1. Mobile navigation 2. Exchanging messages 3. Offline application	Ministry of Health
1. Users can access the website via a mobile phone to get simple information 2. The Ministry provides a general application about overall sectors in the country and phone notes; users need to download it and can access it for free	1. Mobile navigation 2. Offline application	Ministry of Education
1. Users can access the website via a mobile to get simple information 2. The Ministry provides a free application for the user to download and they can access information, check states, update information	1. Mobile navigation 2. Online application	Ministry of Higher Education
1. Users can access the website via a mobile to get simple information 2. Users can request and update information about services via SMS	1. Mobile navigation 2. Exchanging messages	Ministry of Finance
The Ministry provides a mobile interface independent from the web; it provides information, files, download, update, log in/out, check states	Mobile interface	Ministry of Rural Municipalities
Users can request and update information about services via SMS	Exchanging messages	Ministry of Interior
1. The Ministry provides a mobile interface independent from the web€ it provides information, files, download, update , log in/out, check states	1. Mobile interface 2. Exchanging messages	Ministry of Labor
1. Users can access the website via a mobile to get simple information. 2. Users can pay for the Ministry accounts via a mobile	1. Mobile navigation 2. Online payment	Ministry of Social Affairs

3. M-GOVERNMENT MATURITY MODELS

There is limited literature related to maturity models for e-government. From the researcher's point of view, some useful models have been provided. The most widely used models are shown in **(Fig. 1)**.

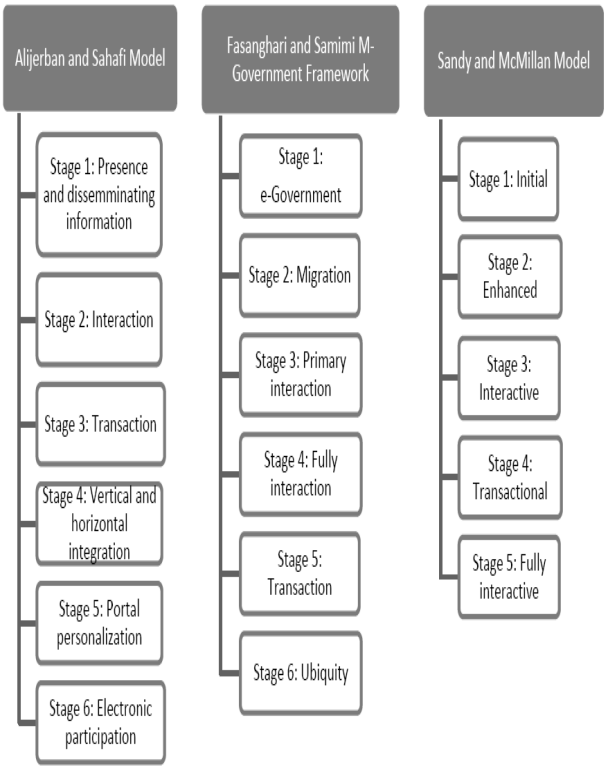

Fig. 1: M-Government Maturity Models

Stage 1: Initial Phase – this is the information stage which presents the basic level of maturity. It contains general information or standards which can be downloaded or viewed via mobiles.

Stage 2: Enhanced Phase – this is the interaction stage which provides two-way communications between citizens and government. Citizens of the M-government facilities will able to download forms, use search engines for searching data, deliver comments, and also will able to have discussion or conversation with government officials through chat rooms, SMS, exchanges, and e-mail services. Location based services with Log-in information and password validation also could be provided.

Stage 3: Reforming Phase –this is the transaction stage which need applications proficient of performing secure transactions. Small transactions can be complete with the use of simple applications or simple mobile phones. Citizens can begin financial transactions with a simple SMS services.

Stage 4: Enrichment Phase – this is the full integration phase where the online services of governments are provided across institutions vertically and horizontally. All available services of the government are accessible to the citizens through a single portal or an internet access point. Users who are accessing the portal should be able to continue with financial transactions and interconnect with different government agencies.

Stage 5: Governance Phase –this phase is called transformation and participation stage. Presently not a single country has achieved this level absolutely. To accomplish this level, a good infrastructure and well coordination are important for the government as well as for the agencies and the stakeholders. In this phase, it is necessary to share common process and establish a common understanding among all the departments of the government for presenting their information to each other. It is also necessary in this phase to fulfil all the requirements for accountability, transparency, and electronic democracy.

The m-government stages have the following features:

1) Stage I contains informational stage content such as fundamental information with vital web technology and vital application services
2) Stage II contains interactional stage content such as two-way communication via SMS, web, email, chat, collation-based services and log in/out functions
3) Stage III contains transactional content such as payment transactions with high levels of security and small business transactions that could be done using simple applications
4) Stage IV contains fully integrated content that enables citizens to access government services using a single portal while maintaining security and privacy levels, personalization and financial transactions
5) Stage V needs to have the highest level of integration between agencies, capabilities, transparency, accountability and good infrastructure as well as coordination between government agencies.

For the purposes of this research, a survey of m-government services in Saudi Arabia was carried out based on the above maturity model. **(Table 2)** is a summary of the survey.

Table 2: Survey of Saudi M-Government Services Based on the Maturity Model

No	Authority	Informational	Interactional	Transactional	Fully integration	Governance	Stage
1	Saudi telecom	yes	yes	No	No	No	II
2	Ministry of civil services	yes	yes	No	No	No	II
3	Ministry of water and electricity	yes	yes	No	No	No	II
4	Ministry of health	yes	yes	No	No	No	II
5	Ministry of education	yes	yes	No	No	No	II
6	Ministry of high education	yes	yes	No	No	No	II
7	Ministry of finance	yes	yes	No	No	No	II
8	Ministry of municipalities rural afire	yes	yes	No	No	No	II
9	Ministry of interior	yes	yes	No	No	No	II
10	Ministry of labor	yes	yes	No	No	No	II
11	Ministry social affairs	yes	yes	yes	No	No	III
12	Ministry of commerce and industry	yes	yes	No	No	No	II
13	m- government integration services "ISHAAR"	yes	yes	yes	yes	No	IV
14	Ministry of Civil defence	yes	yes	No	No	No	II
15	Social organization and social insurances	yes	yes	No	No	No	II
16	Saudi commission for truism and antiquities	yes	yes	No	No	No	II
17	Real estate development fund	yes	yes	No	No	No	II
18	Technical and vocational training corporation	yes	yes	No	No	No	II
19	King Saud university	yes	yes	No	No	No	II
20	General presidency of tow holy mosques	yes	No	No	No	No	I
21	Bureau of investigation & prosecution	yes	yes	No	No	No	II
22	Direction of traffic	yes	No	No	No	No	I
23	Jazan province	yes	No	No	No	No	I
24	Emara of Makkah Region	yes	No	No	No	No	I
25	East region municipality	yes	No	No	No	No	I
26	Hail province	yes	No	No	No	No	I

4. RECOMMUNDATION AND CONCLUSION

M-government services provide a fast channel to enrich people's lives with information and services wherever they are. In the Saudi Arabian context, m-government is growing and many Ministries and departments are using mobile technology to deliver their services. The survey of the services based on the maturity model has shown that from the 26 m-government services surveyed, six are in Stage I. In Stage II, there are 18 services. In both Stage III and Stage IV, there is one service. No services are in Stage V yet.

Although, comparative studies on the benefits of E-government and M-government have presented largely (infoDev, 2009, Hanna, 2010), it is still unidentified the impact of many M-government services. Deprived of having a clear evidence, many governments have started to investigate the possible benefits of M-government as for low risk or in the limited ways. Some governments are taking responsibilities with normal mobile tools for service delivery and governance. In this case, according to William and Shearer (2011), the following key recommendations for the next generation public service are necessary and needs to take into account for policy formulation.

- Citizen-centric: Strategies of most governments are not advanced enough to observe policy making from citizen's perspective. To change the viewpoints of government, proper changes in thinking and also the structure of the government are importantly necessary.
- Restructured government: Government needs to focus more on co-operative models of service delivery and policy design which means, adoption of proper approach, employment of appropriate stakeholders, and public agencies.
- Participatory, measurability, and transparency: Nowadays, citizens are becoming more aware and responsive about the government policies. Besides that, citizens are also contributing in policy making in some developing countries. Citizens' participations in the development of government activities and their ability to measure the results, impacts, and outcomes of government programs will be the main features for next generation public services.

One of the limitations of this study is that all the services that have been ranked are fully government services. There are other collaborating services between government and private sectors that were not covered in this study. For future work, follow-up research could examine the services individually and re-rank each service based on its effectiveness and success.

REFERENCES:

Alssbaiheen, A., S. Love, (2015). The Opportunities and Challenges Associated With M-Government as an E-Government Platform in KSA: A Literature Review. InternatIonal Journal of and BusIness studies, JMBS Vol. 5, 287-92. AprIl - June 2015, ISSN: 2230-9519 (Online) | ISSN: 2231-2463 (Print)

Alfarraj, O., S. Drew, R. Alghamdi, (2011). E-government stage model: Evaluating the rate of web development progress of government websites in Saudi Arabia. International journal of advanced computer science and applications IJACSA, Vol.2 No.9 121-126.

Alijerban, M., F. Saghafi, (2010). M-government matuirty model with technological approach. IEEE 978-1-4244-6982-6.

Abramowicz, W., A. Bassara, A. Filipowska, P. Zebrowski, (2006). Mobility implications for m-government platform design . Cybernetics and system: an international journal, 37:119-135, Taylor and Francis Group, DOI: 10.1080/01969720500428255.

www.mgovernment.org/resurces/euromgvo2006/.../8_Chatzinotas Communication and information technology commission, accessed by http://www.citc.gov.sa/ 1/1/2012.

Fasanghari, M., H. Samimi, (2009). A novel framework for m-government implementation. International conference on future computer and communication, IEEE 978-0-7995-3591-3/09, DOI: 10.1109/ICFCC.2009.146. Turkey.

Kushchu, I., M. Kuscu, (2004). From e-government to m-government: Facing the inevitable. Mobile Government Lab, http://www.mgovlab.org.

Mukherjee, A., A. Biswas, (2005). Simple implementation framework for m-government services. Proceeding of the international conference on mobile business ICMB'05, IEEE 0-7695-2367-6/05.

Mengistu, D., H. Zo, J. Rho, (2009). M-government: Opportunities and Challenges to Deliver Mobile Government Services in Develop countries. International conference on Computer Sciences and Convergence Information technology, IEEE 978-0-7695-3896-9/09, DOI: 10.1109/ICCIT.2009.171.

Naqvi, S., H. Al-Shihi, (2009). M-government Services Initiatives in Oman. Issues in informing science and information technology 6.

Rossel, P., M. Finger, G. Misuraca, (2006). Mobile e-government Options: Between Technology-Driven and User-Centric. The Electronic of e-government. Vol.4, No.2, 79-86.

Thunibat, A., N. Zin, N. Ashaari, (2010). Mobile Government Services in Malaysia: Challenges and Opportunities. IEEE,978-1-4244-6716-7/10/.

Wei, Z., X. Gao, D. Jia, Y. Yang, (2010). Research of mobile government based on multi-modal platform with Unified Engine . IEEE 978-1-4244-6837-9/10.

Wilensky, H. L., (2015). Organizational intelligence: Knowledge and policy in government and industry (Vol. 19). Quid Pro Books. China

Rannu, R., S. Saksing, T. Mahlakoiv, (2010). Mobile Government 2010 and Beyond. White Paper, European Union Gegional Development, Mobi Solutions Ltd www.mobisolutions.com http://m-gov.mobi.

OECD, International Telecommunication Union., (2011). M-Government Mobile Technologies for Responsive Governments and Connected Societies: Mobile Technologies for Responsive Governments and Connected Societies, OECD.544-552.

M-Government., (2011). Mobile Technologies for Responsive Governments and Connected Societies – © ITU, OECD. 3001-3007.