Trends in E-Governments: From E-Govt to M-Govt

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Abstract: New technological advancement and availability in mobile devices, technology, applications and networks have made it possible for a common citizens to access information and transact services while on the move. This gives an opportunity for governments to provide such services to citizens at the minimum cost. E-government practice and routine in public sectors are being supplemented and moving towards to m-governement (mobile government). M-Government can be defined as the massive usage of mobile devices with their applications to develop a quick connection and response between citizen and public sector authorities. M-government is a support of improving the quality, time saving and usability of e-government applications around the clock from any location. The existing technological foundations, applications and services support the idea that m-government will be a significant part of e-government efforts. The policy makers and IT professionals need get ready to embrace these developments and participate in the ways to enhance e-government activities through m-government. This transformational process is going on around the world. This article will investigate where governmental organizations are becoming mobil government organization to quickely reach to their citizens and increasing communication with them beyound the limits.

Key words: Mobile Government · e-Government · Organization

INTRODUCTION

Now all most all countries implementing ICT (Information Communication Technologies) in the public administration to make easy and friendly usage to their citizens in their related areas round the clock. According to Bolívar et al. [1] the interest in the implementation of ICTs in the area of public administration has been reflected in a gradual increase in the research carried out in the field of e-Government from last few years, focusing on deliberative democracy, innovation and modernization in the management of public administration, e-Government program/project evaluation, policy analysis, accountability and transparency etc [1, 2, 3, 4].

As regard to the communication with stakeholders, it has led to greater electronic democracy (e-participation) and the integration into the user community of the political background to governmental decisions (e-decision making), without the need to form part of the public administration or to belong to a political party. e-Government drivers can be incorporated with modernization and reforms in public administration and the development of the Information Society [3, 4].

e-Government has become an explicit component of public sector reforms, used to increase efficiency, strengthen competitiveness and enhance modernization. In this context, the present paradigm on the use of ICT in e-Government focuses on greater quality and efficiency in public services, mainly by delivering existing services through cheaper ICT-based channels of distribution or by complementing existing services with added e-features.

The vision of e-Government in the EU (European Union) countries for at least the next decade, defines e-Government as a tool for better government in its broadest sense. It places e-Government at the core of public management modernization and reform, where technology is used as a strategic tool to modernize structures, processes, the regulatory framework, human resources and the culture of public administrations [5] to provide better government.

In this paper, we put some text on adoption of m-Government from e-Government. Next present various cases where these new mobile technologies are used for m-government implementations in Turkey. Then conclusion.

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Towards M-Government- There Are Some Factors to Move Toward M-Government: The rapid growth of Mobile technology is significantly enhancing governments' capacity to produce benefits and deliver outcomes for governments (Inter-departmental operations) and easy reach to citizens & businesses community and to impact positively national overall economic growth. Mobile technology is significantly expanding the capacity of government to deliver citizen- and business-centric services [6].

Both m-Government and e-Government are not two separate entities, e-Government based on usage of all ICT technologies to deliver services to citizens and improve the activities of government sector and streamline their processes but on the other hand, m-government is an add on to the e-government confined to use of mobile technologies such as mobile phones, PDAs (Personal Digital Assistant), Wi Fi enabled devices, blue tooth, wireless networks in delivering services [7, 8].

The most notable progress will be in developing countries, which historically have been limited by poor or non-existent communications infrastructure that, in turn, constrains economic development and social improvements [6].

Currently most visible progress will be in developing countries which have been historically limited by poor or non-existent communications infrastructure that, in turn, have constrained economic development and social improvements, but, m-Government development will also provide countries with more developed e-government and the opportunity to tackle a number of issues - such as those related to the digital-divide - which remain a critical factor in the levels of e-government services take-up which are lower-than expected in many countries [6].

The forces and factors influencing the move from e-Government to m-Government activities include major changes in the technological infrastructure and the advances in mobile telecommunication services and availability at competitive prices or less prices and quick global connectivity. By enabling the development of a whole new set of G2C, G2G, G2B and G2E applications and services, m-government affords, for instance, a powerful and transformational capacity to extend access to existing services, to expand the delivery of new services, to increase active citizen participation in government operations and to change the way of working within the public sector [6].

The Emergence of Mobile Internet and Basic Model for M-Government: There are several factors of influencing the move from e-government to m-government activities include major changes in the technological infrastructure and the advances in mobile telecommunication services with easily available on hand-set/mobile devices. Mobile devices are now taking significant roles in our everyday work and business life. The technological changes can be known as: exponential growth of usage of mobile devices; easy connections of wireless telecommunication networks; and the move towards 3G, 4G services with higher data transfer rates. These services include personalization, location based services and context aware applications for users. Conventionally, anywhere – anytime voice communication has been one of the major factors for the growth of mobile phones. Data communications however is now becoming very attractive to many consumers and business users.

At the end of year 2001, approximately 14% of the world population - 850 Million people were mobile phone users. This growth has been spectacular especially in Europe after the telecom industry de-regulation and adoption of Global System for Mobile (GSM) communications [9, 10]. Now, mobile phones are no longer used only for voice communication but are a convenient way of connecting to the Internet and are used for transferring data, exchanging e-mails and doing small scale business transactions. Next to increase in the adoption of mobile phones comes the growth in the sales of PDAs and pagers. Last year's total PDA sales were estimated to be over 20 million [11].

At the end of 2012, there were 6.8 billion mobile subscriptions estimated by The International Telecommunication Union (ITU) [11]. That is equivalent to 96 percent of the world population (7.1 billion according to the ITU) and is a huge increase from 6.0 billion mobile subscribers in 2011 and 5.4 billion in 2010 [11, 12].

In general, there are four primary delivery models of m-government: mobile Government to citizens (mG2C), mobile Government to employees (mG2E), mobile Government to government (mG2G), mobile Government to business (mG2B) (Table 1).

The technology and the speed of the mobile internet has evolved through various generations. Initially mobile telephony systems were analog, circuit-switched. Voice links were poor, capacity was low and security was almost non-existent. Then comes the second generation (2G) protocols using digital encoding such as GSM and CDMA. These technologies are in use around the world and support high rate of voice but limited data transfers. They offer auxiliary services such as data, fax and SMS.

Table 1: Basic Models of M-government

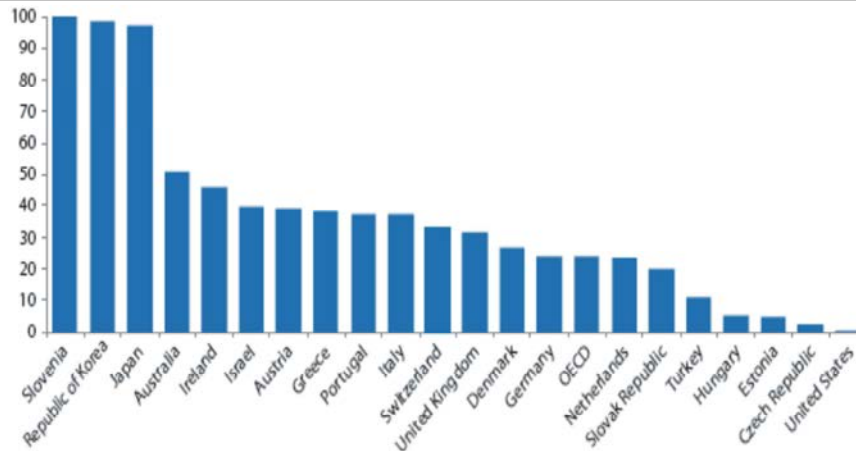| Type	Description	Coverage
mG2C	Citizens (Communication between Govt. Organization and common people)	Individual
mG2E	For Employees (Interaction among Govt. and its employees)	Individual
mG2B	Business Community (Explaining the governmental policies to Business)	Organizational
mG2G	Inter-Governmental operations (Referring inter-departmental communications and interactions)	Organizational

Fig. 1: 3G cellular mobile adoption. 3G subscribers as a percentage of total subscribers (Source: OECD, 2011)

The next generation technologies and protocols, (2.5G) extend 2G systems to provide additional features such as packet-switched connection (GPRS) and enhanced data rates. Third-generation protocols support much higher data rates and are intended primarily for applications other than voice. 3G applications, at a limited scale, have already started in Japan, Europe, part of Asia/Pacific and in the US (Fig. 1). Full-fledged 3G is expected to support bandwidth-hungry applications such as full-motion video, video-conferencing and full Internet access [6, 13].

Bringing the mobile internet to the mobile devices is not an easy task. These devices have limitations in terms of size (small displays and keyboard) and low memory. Also, the technologies are yet to prove themselves with high speed and smooth transmissions without any disconnection. Various wireless standards and handset compatibilities remain to constitute important challenges to real world business applications and implementations on the mobile internet.

Case Study: In Turkey, the government is taking ICT implementation in public sector is very seriously and implementing its most services online for citizens. Network Readiness Indexes presented in the Global Information Technology Reports shows us the technical infrastructure, provided services, development opportunities, legal base and human capital of the analyzed country [14]. Turkey is ranked 52nd out of 142 countries in the World and its overall score is higher than the world average (Table 2).

Table 2: Turkey's Five Year Network Readiness Index Rankings and Scores (Source: World Economic Forum, Global Information Technology Reports of 2007-2012)

Ranking	Score	Year
52	4.07	2012
71	3.79	2011
69	3.68	2010
61	3.91	2009
55	3.96	2008

Table 3: Turkey's e-Government Development Scores in 2008, 2010 and 2012 (Source: Source: UNPAN, United Nations e-Government Survey of 2008, 2010 and 2012)

Ranking	Score	Year
80	0,52	2012
69	0,47	2010
76	0,48	2008

On the other hand United Nations e-Government Survey focuses on the e-Government development levels of the countries. The rankings calculated are formed by evaluating whether the citizens of analyzed country are benefiting from more advanced e-service delivery, having better access to information, enjoying more efficient government management and realizing improved interactions with government [15]. The score of Turkey (e-Government Development Index Values) increases in the period between 2010 and 2012 to 80. e-Government Development Index Values presented in Table 3. These are relatively bright scores for Turkey.
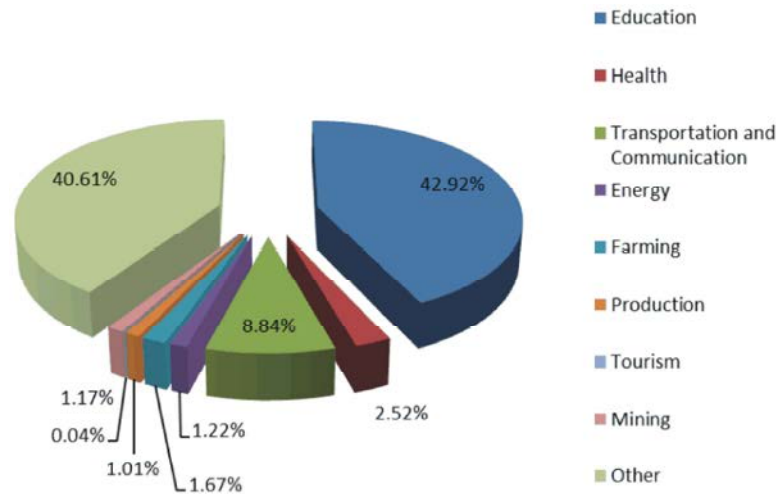
Fig. 2: The Distribution of the service classification of the e-Government Site
(Source: State Planning Organization, Information Society Statistics Report, 2011)

Turkey Republic has an official web site dealing with the e-government applications. The address of the site is www.turkiye.gov.tr and it is called as Turkey e-Government Gateway. The gateway provides access to all the services provided by the government from a single site. The access to the gateway is provided by the identity numbers and passwords of the Turkey citizens. The gateway currently has 15.335.097 registered users. Besides it provides 788 services of 106 governmental departments. Figure 2 shows the distribution of the service classification of the e-Government site for the year 2011.

It is expected that all the governmental services will be integrated to e-government gateway until 2023. Due to reach this goal it is intended to increase the number of services provided by the e-government gateway to 3000 in five years [16, 17, 18].

75.4% of the registered users to the e-government gateway is males. The number of males registered is 11.4 million and the number of females is 3.7 million. The average of the ages of the registered users is above the 30. Besides the ages of the 1.823.000 users are between 18 and 25 and 4.340.000 of the users are between 26-35 years old. The number of users between 36-45 years old is 3.600.000. Due to statistical data provided by the e-government gateway, the gateway is mostly used by the users between 46-65 years old. The number of users in this age range is above the 4.670.000. On the other hand the number of users above the 66 years old is 692.000.

The gateway is protected by applying a multi-layer security architecture. The gateway has several features such as customization, accessibility, integration of information from different organizations and sharing of personal information with others (if allowed). It also supports IPv6. The gateway also uses EU-wide e-government standards and W3C standards. Besides the gateway is designed to be easily used by disabled citizens [17, 18, 19].

M-Government Services in Turkey: The usage or adoption of Mobile phones are becoming the most rapidly adopted technology around the globe. According to Turkish Statistical Institute's (TÜİK) 2012 data, approximately 93% of the population (74 million) has access to a mobile telephony device in Turkey. One fifth of Turkish cell users have smart phone [20]. Smartphone owners in Turkey were most likely to social networking (49%) and playing games (32%) while U.S. users watch video and use maps/navigation apps, Chinese users were more likely to access news and weather updates via their mobile apps [21].

The access to Turkey's e-government site is also possible from the mobile devices. Turkey citizens begin to use e-Government Gateway by the smart phones. Turkey e-Government Gateway (site) can be accessed by Apple iOS android and Windows Phone mobile devices as well (Fig. 3). The link to the download links of those programs are also provided on the web site. Mobil-government applications (m-government) are developed to allow the citizens to access to all the services provided by the governmental organizations without any location and time restrictions. Those applications can be used by any mobile devices such as mobile phones, PDAs, tablets, etc and they don't require any computer to work on. With those features they can be used in any place and in any time.
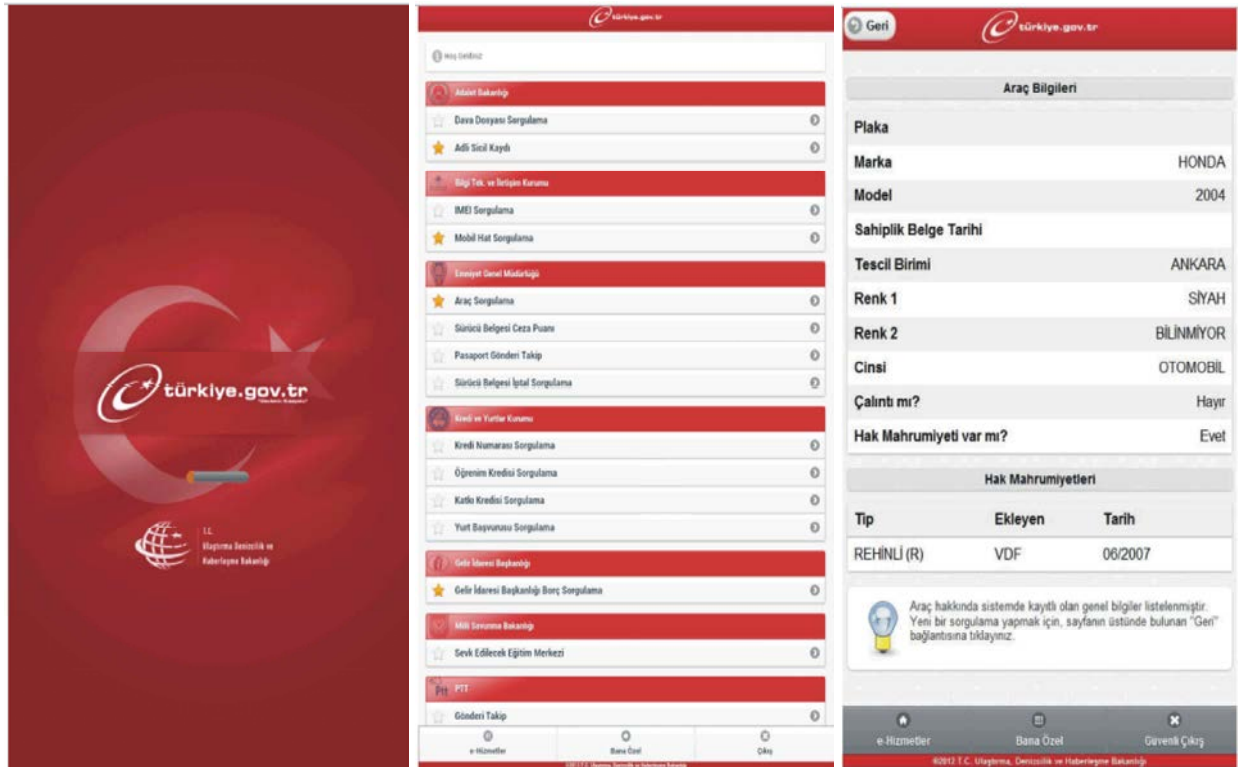
Fig. 3: Mobile Application Interfaces on Turkey e-Government
(Source: Source: Turkey e-Government Gateway 2013)

On the other hand a mobile application (Aradiom Mobile Framework QuickCity- Mobile Government) developed by Aradiom [18], 2013 for Turksat (Turkey's e-Government Gateway operator) enables citizens to access government services from their phones (such as traffic flow with live camera support; city maps with zoom features; ferry, bus, metro schedules; guide to city services; etc.) [6].

There are two common methods to access to m-government applications. The first one is to access the WAP page by using the mobile device's web browser, the second one is to download and install a special software to the mobile device and use it to access the m-government applications. The WAP page can be accessed by the all mobile devices those have web browser which supports XHTML. The software mentioned in the second method is generally developed in Java and it needs to supports the MIDP 2.0 and CLDC 1.0 protocols. The m-government applications are accessible by the internet connections provided by the GSM operators. All the m-government applications are free of charge and citizens pay only for the data transfers provided by the GSM operators.

CONCLUSION

Moving towards M-government technologies by the Governments, fast adoption of mobile technologies is propelled by a several factors, including policies, standards, cultural trends, 24X7 availability, costs and economics. One of the main reason is the user friendly-ness of the system, easy to access on any hand device, of Internet on every kind of hand set etc.

The vision of m-Government highlights the increasing importance of intermediaries – i.e. private, social and public entities, in the delivery of public services and in the exercise of democratic governance. Governments will need to better understand the potential of such actors, in order to develop stronger, more innovative and longer term collaborative models and partnerships and to increasingly consider their needs as users of m-Government services including infrastructure development and try to reach last user of the country.

Better public services and better governance are being demanded from the citizens. In Turkey, the Government is taking a strategic approach to increase the take-up of m-government services for their citizen,

because of demand from environment, which is exponential growth of mobile device users. Thus m-government is emerges as a tool for better government in the coming years and, ultimately, for increasing public value. To respond to the challenges posed by these trends, m-Government will need to be more knowledge-based, user-centric, distributed and networked etc.

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