

Comprehensive model of Mobile Government in Iran

Asghar Afshar Jahanshahi¹, Seyed Mohammad Sadeq Khaksar^{*2}, Noor Mohammad Yaghoobi² and Khaled Nawaser³

¹ Department of Commerce and Research Centre, University of Pune, Researcher Scholar in Business Administration, India

² Department of Management, University of Sistan and Baluchestan, Iran

³ Department of management, Marketing (SIOM) & International Business (AIMS), University of Pune, India
Afsharasghar@yahoo.com; SMS_Khaksar@yahoo.com* ; Yaghoobinor@yahoo.com;
khaled1356@yahoo.com

Abstract

The mobile-Government (m-Government) is one of the most important concepts that have been in the top consideration for the last decades. The purpose of the m-Government is to provide a suitable and reliable infrastructure for citizens to access services easily. It also provides better opportunities to people to participate in social events and activities. By this means, providing tools for implementing the m-Government activities is of most significance. In Iran, m-Government initiative was launched as a part of the country's overall information technology plan (for instance: e-Government) focused on ICT as a tool to reform public organizations. In this paper, a review of literature of m-Government in recent years, together with survey and comparison of current models of m-government, has led to the proposal of native m-services in Iran. The population is all managers of Information technology sectors in 22 regions of Tehran municipalities. Analysis tools of data are SWOT and QSPM matrixes. The outcome results are in the form of a comprehensive model which emphasizes that the m-Government policy can be an effective approach to provide better services to citizens.

Keywords: Government, M-Government, Comprehensive Model, M-Services, Iran

Introduction

Mobile technologies are considered one of the most important government's service sectors in various countries. It is predicted that by the end of 2011, nearly 80 percent of world's population will join to the cell phone users (Rannu *et al.*, 2010). After introduction of telecommunication technologies, this growth rate assumed a rapid ascending trend in Europe (Sadeh, 2002; Al-khamayseh & Lawrence, 2005; Carroll, 2005). Today mobile technologies is advanced to an extent that it has introduced cell phones as one of the most widely used technologies for providing services of e-government (Foghlú, 2005; Naqvi & Al-Shihi, 2009). Mobile technologies introduce internet capabilities in cell phones, PADs, Wi-Fi and wireless networks which provide many advantages for users including easy and convenient access to any kind of information and textual messages (Donegan, 2000; Clarke, 2001; May, 2001).

One of the main applications of mobile technologies (e.g. cell phone) is providing mobile services (m-services) by m-Government (Van de Kar, 2004; Patel & White, 2005a; Hossan, *et al.*, 2005; Alrazooqi & Silva, 2010). The concept of m-Government (attendant government) is hidden in the application of wireless mobile communication technologies of public sector organization and provision of services and sharing information to other organizations and citizens (Sandy & McMillan, 2005).

m-Government is: 1) a government that provides citizens with superior services in the form of wireless and mobile networks (Kapogiannis *et al.*, 2006; Rossel *et al.*, 2006; Rannu, 2003), 2) in spite of limitations of e-government, introduces services in multi-channel mediums and

increases users accessibility (El-Kiki & Lawrence, 2006b; Kumar *et al.*, 2008; Ishmatova & Obi, 2009) and 3) convergence of wireless and wired networks which facilitates better, faster and cheaper access to public services in any time and any place (Kwon, 2004; Borucki *et al.*, 2005).

General goals of m-Government can be considered as: 1) increasing added values of e-government services (providing specific facilities, appropriateness of services, privatization of services) (Carroll, 2005; El-Kiki & Lawrence, 2006b; Fidel *et al.*, 2007) and 2) implementing public services by creating convergence between internet services and wireless services (Curbera, *et al.*, 2003). From citizen points of view, m-Government is a symbol of full-scale access to services of public sector and relevant sectors (Kushchu & Kuscu, 2003; Carroll, 2005; Trimi & Sheng, 2008). Based on these goals, m-government ' performance can be summarized as follows:

- Mobile communications: improvement of communication between government and citizens (C2G and G2C) and creation and sharing information of public sector. These communications promotes social sectors of society and citizens (Trimis & Sheng, 2008; Alrazooqi & Silva, 2010).
- Mobile public management: improvement of internal performances of public sector. Another application of m-Government is developing opportunities for improvement of internal performance of public agents which can be mentioned as organizational entrepreneurship (Centeno *et al.*, 2004; Capgemini, 2007).



- Mobile democracy: Mobile election and using mobile tools for participating citizens in political decision making mechanisms is one of the applied plans of m-Government and a movement toward democratic participation in all internal and external affairs of a country (Christensen & Laegreid, 2002).
- M-services: performing mobile transactions and mobile payment. Mobile technologies not only provide mobile communication between citizens and government, but also support transactions and interactions between government and citizens (Patel & White, 2005b; El-Kiki & Lawrence, 2006a).

Considering that implementation of m-Government policies has no long history in Iran, we have tried to evaluate the role of models used in provision of services and provide a comprehensive and native model (model) for implementation of these services in society and increasing interactions with mobile citizens (m-citizens) by studying famous models used abroad.

M-Services in m-Government: the new approach of e-Government for providing electronic services

Nowadays, most of developed countries and some of developing countries (such as Iran) are implementing e-government projects toward development and improvement of electronic services provision by governments (Belanger & Jannie, 2006).

According to OECD studies (2004), e-government means application of Information and Communication Technology in general and Internet in particular for implementing public services. Faya (2001) believes that e-government is a change in management of public organizations through paying attention to the infrastructures of Information and Communication Technology (Faya, 2001). E-Government includes computerized (automation) activities that provide new methods for offering public services (Kwon, 2004), New procedures for exchanging information with private sector agencies (Kim *et al.*, 2004; Borucki *et al.*, 2005), New techniques for hearing citizens' comments (Alrazooqi & Silva, 2010; Sandy & McMillan, 2005) and new strategies for sharing information in public organizations (OECD, 2004; Markellos *et al.*, 2007). Main goal of governments using e-government mechanism is to pay more attention to needs of citizens and to increase their consent of services.

Therefore, the most important challenges of e-government is providing easier access of citizens to electronic services, improving public services and increasing speed and accuracy of implementation of these services. Strategies created to implement e-government's services, although do not damage government's nature; they have changed public structures (budget, structure of public organizations, technology and standards). Main goal of these strategies is to create as many interactions as possible between government and clients (Sathye *et al.*, 2004). Growing

rate of penetration of cell phones among people represents the movement toward providing new services in different sectors. E-Government will be able to become m-Government by considering primary principles of e-government and by developing infrastructures of cell phone (Foghlú, 2005).

Some researchers believe that m-Government is a subset of e-government that provides electronic services by means of mobile technologies (m-services) (Kushchu & Kuscu, 2003; Cilingir & Kushchu, 2004). According to this view, m-Government is only a part of e-government which facilitates provision of public services. In contrast, other researchers believe that like e-government, m-Government is a tool in hands of governments that is used for achieving major goals (Pandya, 2002; Albayrak, *et al.*, 2003; Luvangal & Reejiraj, 2007). They believe that m-Government is an advanced form of e-government. But there are researchers who do not believe so but a subset of e-government. They suggest that services of m-Government are the same as those of e-government, but they are created by mobile technologies and this does not mean change of e-government's structure (Gang, 2005; Yu & Kushchu, 2004). What revealed by examining various views are the importance of m-Government for providing better electronic services. Although authors of the present article believe that m-Government can be considered as a subset of e-government, but importance of services in m-Government is so much and so prominent that it can be considered as a new domain of public services.

Advantages of m-Government

Ndou (2004) has determined the advantages of m-Government in providing electronic services, which include reduction of organizational bureaucracy, faster access to information, created opportunities for interactions of G2B and G2C and promoting the quality of public services. To have a better understanding of m-services profitable by m-Government, other advantages can be considered (Fig. 1):

More profitability:

VenturLine (2005) has considered profitability of providing public services in C2B activities. This can be evaluated in valuation of services and information content. Value of services is obtained from feedback of evaluation of services. It depends on various expectations of citizens for accepting or rejecting services (Rieger *et al.*, 2003). Suomi (2006) believes that the more valuable are electronic services of government, the more effective is attention and using these services in increasing the consent of citizens. Profitability in provision of m-Government services depends not only on the value of services but also on the content of these services. If the content of services is update and complete and includes a wider range of citizens, the profit obtained from providing m-services will be more (Faya, 2001).

Promoting service quality: Providing electronic services of m-Government is profitable for both parties and increases the quality of electronic services (Bassara *et al.*, 2005). Some researchers consider the superior quality of services as one of the main requirements of consent of citizens of public services (El-kiki & Lawrence, 2006a; Tomas *et al.*, 2008; Kaliannan *et al.*, 2009). Electronic services of m-Government allow citizens to examine various options and to accept the service they want, and this leads to increase of services utility. Quality of services can be evaluated in terms of five elements: informing capability, accessibility, readiness, reliability, accuracy, responsiveness and shortening of communication route. Informing capability means knowing type of services and mode of providing services by m-Government (AOEMA, 2004; Al-Khamayseh *et al.*, 2006). Accessibility is a process by which all citizens can use services of m-government's services in any time and place with highest informational security (Ghyasi & Kushchu, 2004; Hossan *et al.*, 2005). Readiness for accepting services is a concept that represents users' understanding of accepting public services by wireless and mobile technologies (Stormer *et al.*, 2005; Saghafi *et al.*, 2009). Some researchers do not believe that readiness only depends on attention of citizens to type and provision manner of services, but they believe that government should exhibit its readiness for providing m-services. Creating a suitable cultural environment for acceptance of new technologies, developing suitable infrastructures of information and communication technology, detecting new opportunities for providing and hearing client's comments are among items that m-Government should consider in order to show its readiness (Kushchu & Kuscü, 2003; Hossan *et al.*, 2005). Reliability means the amount of trust that citizens obtain from public services provided using mobile technologies (Tomas *et al.*, 2008). Accuracy of m-services refers to items such as network security, protecting privacy of citizens, confirmed source, etc (Clarke, 2001; May, 2001; Richtel, 2005; Suomi, 2006). Another area of service

quality is responsiveness of public sectors to m-citizen (end users). Responsiveness increases the utility of m-services and provides execution guarantee required for providing services by public organizations. Shortening of the communication route between government and citizens also influences service quality strongly and can increase or reduce consent of citizens (Tomas *et al.*, 2008; Kaliannan *et al.*, 2009).

Effective transactions: providing m-services in government will be effective and efficient when it possess public accessibility as well as high security and protects privacy of citizens (Hossan *et al.*, 2005; Suomi, 2006). Using mechanisms of m-Government will increase efficiency of transactions for citizens. Components of this section include usability, easy application of mobile technologies, appropriateness of services, protection of citizens' privacy and information security.

Improvement of performance of strategic activities:

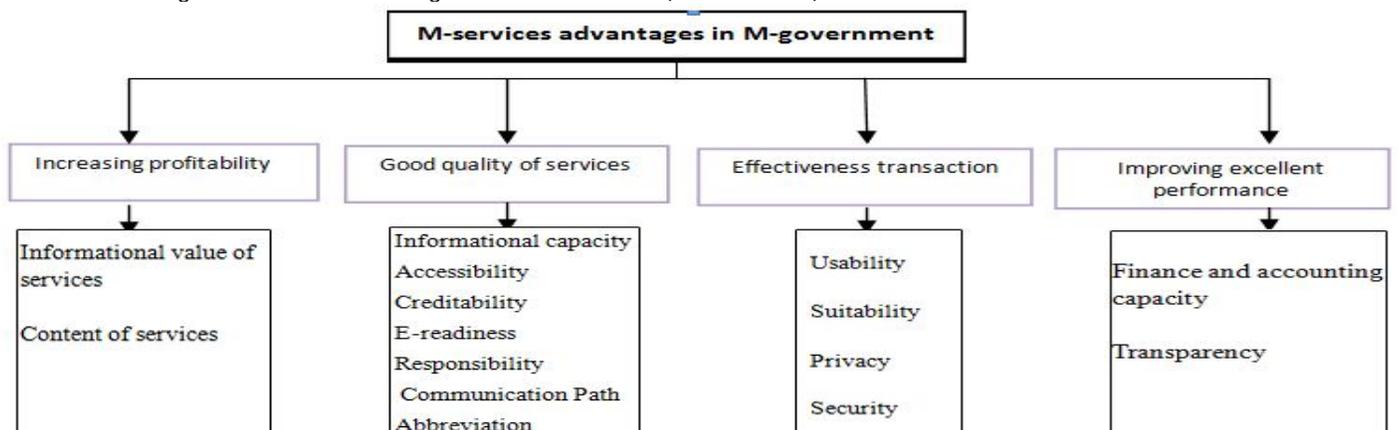
Using the mechanisms of m-Government has many strategic capabilities for improving services. One of the most important topics in providing m-services by m-Government is financial-accounting capabilities which can be obtained more easily using services of m-Government (Christensen & Laegreid, 2002). This capability allows citizens to perform mobile payments and financial transactions with public sector organizations. Another activity at strategic level is transparency.

Transparency means freedom for decision making in activities that are performed by public sectors and make them responsive for implementing any kind of services (Heeks, 2004). In other words, with transparency, everyone any time can state any criticism or suggestion about m-services of m-government. Transparency means visibility of service system of m-Government for citizens (Reffat, 2003).

Valuation for citizens:

Attitudes and functions of m-Government are extending every day. What matters is the value that is obtained through providing these services to citizens (Centeno *et al.*, 2004; Capgemini, 2007). Kumar

Fig.1.m-Services advantages in m-Government (authors' work)



(2008) believes that the value obtained by providing m-services to citizens in one year is several times more than that obtained from providing the same services in e-government (Fig.1).

In addition to the above mentioned advantages, there are other researches that have suggested special advantages for providing m-services in m-Government which are summarized in Table 1.

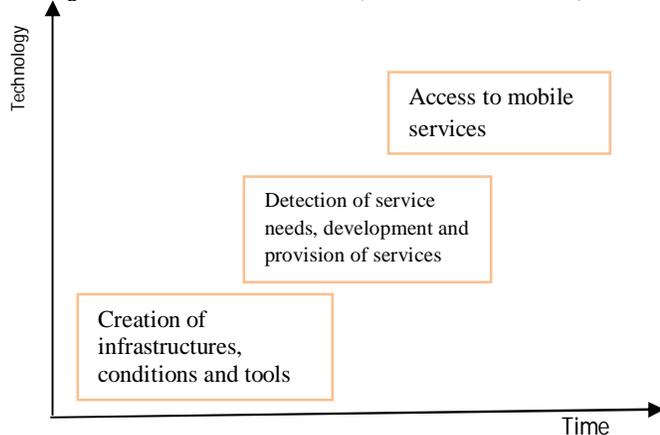
Table 1. Special advantages of m-Government

Advantages	References
Increasing channels in order to improve interactions	Faya, 2001; Centeno <i>et al.</i> , 2004; Heeks, 2004; Capgemini, 2007
Service presentation for the public in place	Rannu, 2003; Kwon, 2004; Tomas <i>et al.</i> , 2008; Kaliannan <i>et al.</i> , 2009;
Easier access to the necessary information for citizens	Sandy & McMillan, 2005; Hossan <i>et al.</i> , 2005; Suomi, 2006
On time and quick update of data and information	Donegan, 2000; Clark, 2001; May, 2001; Capgemini, 2007
Increase productivity of public sector services	Heeks, 2004; Tomas <i>et al.</i> , 2008; Rannu <i>et al.</i> , 2010

Evaluation of common models of m-Government for providing m-services to citizens

Centeno *et al.* (2004) designed a model for implementing e-services at m-Government level, which has three parts. This model which is focused on needs of citizens has the following parts: 1) creation of infrastructures, conditions and tools required for providing m-services, 2) detection of service needs, development and provision of services and 3) access to m-services (Fig.2).

Fig. 2. M-Government model (Centeno *et al.*, 2004)

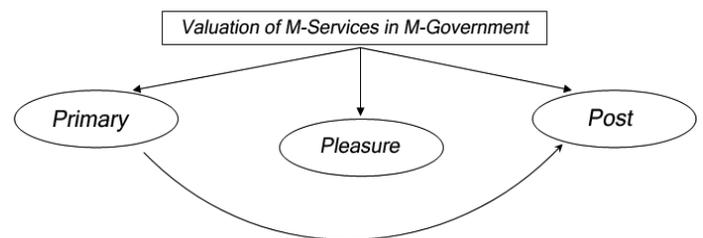


In the first part, readiness of citizens for using services of m-Government is examined and efforts will be done to increase it. The main duty of government in this part is to develop infrastructure of mobile technologies, to coordinate this technology with infrastructure of ICT and to create the culture of using m-services instead of electronic services (Ghyasi & Kushchu, 2004; Hossan *et al.*, 2005). In second part, the government provides

services to citizens. Providing services for citizens is the most important issue for developing consent of users of m-Government services. If government can detect new needs of m-service, it will be possible that citizens will be able to meet their needs without facing various problems (Tomas *et al.*, 2008; Kaliannan *et al.*, 2009). In the third part of this model, accessibility of services is considered. In this part, the government should provide necessary conditions for easy and rapid access of citizens to m-services of m-government. In other words, the third part of this model refers to the interaction between citizens and government.

Yu and Kushchu (2004) stated the importance of providing m-services in m-Government by a three dimensions model. Their model has three main parts

Fig. 3. 3D model of m-services in m-Government (Yu & Kushchu, 2004, p. 887-898)



which are explained in Fig.3 & Table 2.

Table 2. Valuation component of m-services in m-Government

Dimension	Descriptions	usage
Prime value	Considering real informational needs of users. This type of value provides primary needs of users in order to solve problems	Short message system for deaf people. Quick access to a set of requested information. Locating stolen goods.
Pleasure value	Presenting better services to citizens in a dynamic and desirable interaction between government and citizens	M-transactions. Rapid informational interactions. Coping with crimes.
Post value	Citizens' self-service among various options	GPS. M- Vote.

However, it should be added that implementation of the plans of m-Government requires specific conditions the most important of which is electronic readiness of citizens for accepting the political/cultural/technical infrastructures of this phenomenon (Rossel *et al.*, 2006). Therefore, public sector managers should examine and implement

Table 3. Model of success factors

Factors	Description	References
Cost	The need of studying the infrastructures of public sector and major options for joint investment with private sector factors. Analyzing primary high investment and capital return; studying factors and political consideration, ability in reviewing exchanges and procedural benchmarking; fulfilling expense-profit aims in long term agreements with telecommunication and related companies	Heeks, 2004; Ghyasi & Kushchu, 2004; Hossan, <i>et al.</i> , 2005
Business Process Re-engineering	Focusing on potential political independence and supporting of competitors' channels; systematic and lawful integrated environment in order to facilitate operational functions of mobile government; human relationships for presenting governmental and judicial services; transferring technology from old systems towards the connectors (interfaces) of mobile government	Kushchu & Borucki, 2003; Bassara <i>et al.</i> , 2005
Education	Presenting literacy services through mobile wireless systems. Standardization of operational environment ignoring instruments or interfaces; redefining governmental services and products in wireless and mobile system arenas. 24 hour access to all literacy groups	Kwon, 2004; Rossel, <i>et al.</i> , 2006; Reffat, 2003
Acceptance of public	Presenting integrated and equal services through mobile interfaces; managing customer relationship as the major issue of presenting mobile services for mobile citizens in the mobile government; citizens' participation in gradual evolution of mobile government- managing relations with mobile government between agents and sections.	Heeks, 2004; Kim <i>et al.</i> , 2004; Borucki <i>et al.</i> , 2005
Security	Appropriate relations in service levels require maintaining the security network. The security of financial exchanges and accounting, the security of data storages.	Heeks, 2004; Reffat, 2003; Pandya, 2002
Accessibility	Connecting all beneficiaries including mobile citizens (final users), suppliers of governmental services and interface networks.	Luvangal & Reejiraj 2007; Albayrak <i>et al.</i> , 2003; Pandya, 2002

Source: A Sandy, McMillan, 2005, p:2-6

technologies such as e-government and m-Government using ICT.

Ghyasi and Kushchu (2004) proposed a model for evaluation of applications of m-Government in which classified ordinary applications (receiving short messages from public sector organizations, receiving information from stock market, meteorology, sending educational information to schools for students), interactional applications (interactions of schoolmasters with families, interactions of public organizations with citizens, creating constructive relationships between internal parts of organizations) and fully interactional applications (interactions of public sector organizations with each other, interactions of public and private sectors organizations and concurrent interactions of citizens with citizens and government).

The model of success factors was proposed by Sandy and McMillan (2005) and in a study done in 33 hospitals of Ireland (Table 3). The main topic of this model is the evaluation of the manner of providing m-Government services at a reliable and specific level. In this model, provision of m-Government services is evaluated in five levels:

Preliminary level: Providing infrastructures required for wireless access to citizens' information and performing non-interactional activities in this regard such as opinion poll.

Advanced level: updating information and providing related services such as weather prediction, traffic status of cities, electronic payments and political changes.

Interactional level: Developing official interactions between citizens and providers of public services. At this level, necessary information about different services of public sector is provided to citizens and information about citizens' needs is provided to public sector organizations. For example, citizens receive necessary forms and documents from informing websites of these sectors.

Transaction level: Developing a single interaction opportunity for sharing value between m-citizens and m-government. At this level, mobile transactions are usually performed through specific mediators under the complete control of government. The manner of providing services is totally made-to-order.

Totally interactional level: At this level, security of mobile interactions and transactions for payment, ordering and issuance of service bill is considered. At this level, mobile and wireless technology acts with the aim of creating independence, increasing security and protecting privacy of individuals. Interactions of this level are created not only between citizens and government, but also among citizens and among internal divisions of public sector organizations.

Acceptance of mobile and wireless technologies is only one part of the platform which allows movement from e-government toward m-Government (eC3, 2007). Therefore, planning for development and implementation of services at this platform requires careful consideration of factors that bring success to the strategies of m-Government for providing m-services (Heeks, 2004). In recent years, other models have been proposed all of

which are more or less some versions of the above mentioned models.

Proposed model: three sections and seven-level-model of providing m-services in m-Government

Technologies reach to perfection level only when they can attract a large number of users in any time and place. In this situation the famous statement "technology is in its main route" is stated. In 2009, all of the mobile technologies such as Short Message System (SMS) and Voice were put in their main route and attracted over 70 percent of world's population. Some technologies that are yet to evolve and progress in our country include WAP, GPRS and 3G. Although the above mentioned models show high capabilities of governments for developing m-Government in developed countries, but it should be noted that implementing m-Government in some countries like Iran that is far from developed countries, depends on readiness for accepting these technologies and existence of reliable infrastructures for ICT. So, providing a native and comprehensive model which is coordinated with infrastructures of ICT and readiness of citizens for using m-services is necessary. Since using SMS in Iran has been prominent more than other m-services and can be used as a basis for implementing service policies of m-government, a model can be proposed for providing m-services of m-Government in Iran. This model consists of three sections: communication, interaction and network.

Communication section

This part is consisted of citizens' voice level and preliminary informing level; at **citizens' voice level**, plans of m-Government are performed in form of listening to complaints and receiving oral reports of citizens. At this level, communications are unilateral. This kind of communications usually can be created at local level.

At **preliminary informing level**, SMS-based applications will be able to develop communication between government and citizens (but it is a unilateral relationship). Sending public notices and internal news by government and sending reports, documents and personal information of citizens are performed at this level. Providing public services at this level is performed through encouraging citizens to use m-services.

Interaction section

At previous level, m-Government services can be provided by simple infrastructures and technologies and with low level of readiness for receiving m-services. Therefore, at interaction level, this level of readiness will increase and higher-level mobile technologies will be used.

At **advanced informing level**, communications are formed by interaction. Citizens send short messages to the intended system in public sector in order to receive services and they will receive the intended service or information about it in the shortest time possible. These

services are performed at limited level and in a textual form.

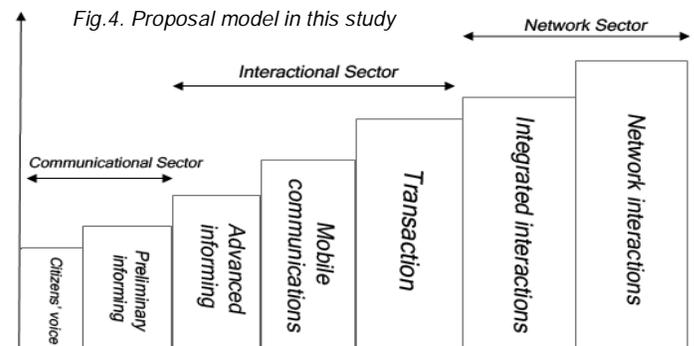
At **mobile communications level**, communications are developed bilaterally between citizen and government. Services such as query, search, complaint request or receiving reports about type of services, are implemented in this interactional section. The difference of this level from previous level is in the responsiveness of system. At this level, government should be responsive about provided services and accessibility of services, defects of system and so on.

At **transaction level**, citizens will be able to pay their financial bills and update and transfer their personal information. At this level, any kind of official-financial services, including receiving and issuing credit cards, issuing certificates, receiving reports and so on, can be performed by public agencies in any time and place using a security channel and the necessary feedback can be received. Advantages of this level include easy access, high readiness of citizens and government, accuracy of information, responsiveness, reliability and valuation of system, appropriateness of services, protection of privacy and security. Interaction part can be implemented at national level.

Network section

In this part, government will be able to communicate with a larger number of citizens simultaneously. In addition, infrastructures and tools of mobile technology have become more advanced and readiness of citizens for accepting m-Government services has increased.

At **integrated interactions level**, system is able to provide the communication between citizens and government and manage received information simultaneously (even in presence of several million users).



At **network interactions level**, in addition to development of network relationships between government and citizens, public sector organizations and other organizations, public sector organizations and private sector organizations, and citizens with each other, m-services are provided in network format.

According to this model, movement trend in Iran has been effective and positive for improvement of m-services and it is predicted that by the end of 20-year perspective,

Table 4. SWOT analysis for Iran's m-Government

<p>Strengths S1: Economic development at national and international levels S2: Integration of public services and promotion of social infrastructures S3: Increasing literacy level of citizens S4: Supporting all social classes, particularly low-income class S5: Promotion of mobile and communicational infrastructures S6: Supporting private sector S7: Reduction of government 's costs S8: Increase of speed, accuracy and efficiency of public sector services S9: Increase of citizens' Satisfaction</p>	<p>Weakness W1: Limited application of Internet in poor areas W2: Non-integrated ICT infrastructures W3: Traditional approach in some ministries W4: Traditional bureaucracy in public organizations W5: Lack of enough expert forces in all sectors W6: Lack of integrated regulations for ICT development W7: Lack of necessary knowledge about advantages of mobile technologies for providing services among citizens W8: Limited growth of applications of ICT in education and training</p>
<p>Opportunities O1: Rapid movement toward G2C and G2B services O2: Movement toward globalization and joining to WTO O3: Movement toward privatization of public entities O4: Successful implementation of plans of e-government O5: Movement toward development O6: Movement toward flexible and open-minded society</p>	<p>Threats T1: Lack of integrated priorities in decentralization of e-government activities. T2: Lack of electronic readiness of employees of public organizations for accepting functions of mobile technology. T3: Lack of integrated guidelines and strategies for acceptance of mobile technologies in public sector T4: Frequent structural changes in implementation of ICT programs in public organizations T5: Unfortunately, growth of ICT sector in Iran depends on request of public sector.</p>

all public services will be provided through mobile technologies. Fig. 4 shows proposal Models in this study.

About this model, it should be added that: Each level involves its previous level; providing services at higher levels indicates the readiness of citizens for accepting m-services and represents the promotion of technology level; Implementing this model for providing m-Government services in Iran is a big step for approaching to developed countries.

Case Study

M-Government services in Iran

M-Government services in Iran can be used with the aim of improving transaction mechanism of public services, creating communication between citizens and politicians, mobile participation of citizens in political

decision makings, providing mobile social services and supporting activities of private sector agencies. The proposed model can be evaluated based on ICT infrastructures in Iran using SWOT analysis.

Research methodology and methods of data collection: The research methodology is applied as far as the aim and objectives are concerned and it is quantitative as far as the analysis and interpretation of data are concerned. Questionnaire and interview with experts are the instruments for data collection. The researcher will make use of questionnaire in order to collect data (adapted from previous researches and based on the conceptual model of research) after interview with academic experts and managers of IT sectors in governmental organizations. The questionnaires are designed by Delphi method and distributed among 22 managers of Information technology sectors in 22 regions of Tehran municipalities (as the statistical sample of research). As the researcher requires the consensus among experts and specialists in Delphi method, thus, the statistical sample should be considered as limited. Questionnaires should be distributed among the statistical sample till obtaining the total consensus about the research questions. Therefore, the answered questionnaires are distributed among the statistical sample rotationally. The experts reform and correct their new answers by observing the previous answers.

The integration of answers are obtained (by Delphi method) after three stages of distribution of questionnaire among recipients anonymously. Moreover, the most important environmental (opportunities and threats) and local (strong and weak points) factors are specified by the making use of suggesting model in order to achieve the aims of m-Government in which these factors are presented through the SWOT matrix framework in table 4. Table 4 shows SWOT analysis for Iran's m-Government.

The QSPM matrix is used in order to classify every component in four-lateral sections of opportunities, threats, weaknesses and strengths. To do so, the second questionnaire which contains the information of SWOT matrix are distributed among recipients of the first questionnaire and after that, 10 important key factors are classified and prioritized by combining all factors.

In the other words, QSPM matrix analyzes the attractiveness rate of the effective factors on SWOT matrix and the total attractions of every strategy are determined after calculating the attractiveness rate of every factor. The most important strategy will have the most rate of attractiveness numerically.

Accordingly, the Table 5 shows the major advantages that Tehran municipality should consider for the purpose of applying the suggested model to present services of m-government.

Table 5. Major advantages to present services of m-government

Score	Rank	Factors
10.112	1	Facilitating the country economic development and reducing the distance to the developed countries
9.873	2	Increasing the rate of services to citizens and consequently increasing the rate of public satisfaction
9.453	3	Improving the employment and job situation and decreasing unemployment
8.766	4	Moving towards minimizing government and improvements in privatization
8.223	5	Decreasing the government expenses and upgrading the personnel's performance

Conclusions

Services provided by m-Government lead to better, faster and less limited provision of services to citizens. By providing appropriate conditions, these services can be used in society more widely (Luvangal & Reejiraj, 2007; Albayrak *et al.*, 2003). Using wireless and mobile technologies in societies is one of the best strategies for providing better services to citizens due to their low cost and high speed (Cao & Luee, 2007; Mengistu *et al.*, 2009; Vincent & Harris, 2008). Providing these services using services like SMS is suitable for beginning. But this must be noted that expectations of citizens from government for providing better services are growing. So, in order to provide better services, government should use newer technologies with higher speed and less limitation (Ntaliani *et al.*, 2008; Silvana & Hong, 2008). Although m-Government has unique features and creates more added values in developed countries than e-government, it leads to identification, discovery and creation of new opportunities for providing services in developing countries. To achieve these new opportunities, the following are necessary: Using facilities of cell phones should increase in developing countries (Kumar *et al.*, 2008; Silvana & Hong, 2008; OECD, 2004); Readiness for accepting m-Government services should rise among citizens and Costs of using and purchasing mobile technologies and equipments should decrease (Curbera *et al.*, 2003; Ghyasi & Kushchu, 2004; Foghlú, 2005; Fasanghari & Samimi; Cao & Luee, 2007; Naqvi & Al-Shihi, 2009). In this research, efforts are made to illustrate the role of mobile technology in presenting services by presenting a comprehensible and local model of mobile government. This model clearly shows that presenting services in the mobile government, like the electronic governments that depends on effective components such as electronic readiness, depends on those infrastructures which are based on information and communications technology as well as the rate of the impacts of these technologies on public participation and citizens' satisfaction. Accordingly, the stages in the suggested model are designed as stair with regards to the rate of government, organizations and infrastructures ability from social and cultural prospective. The results of this model in all three stages in Tehran

municipality show that the establishment of the mobile government for presenting citizenship services is received more than that of the electronic government.

The SWOT matrix had analyzed the key success factors of mobile government project. Accordingly, establishing and running the mobile government in Iran is a precious step in order to obtain citizen-oriented aims and objectives which study the services of mobile government from political, economic, cultural, social, sanitary and environmental Perspective. The obtained results from the matrix had presented and classified the suggested strategies about implementation of mobile government project in the form of QSPM matrix.

Thus, it is suggested that organizations and institutes in the governmental sector should take effective steps in presenting mobile services with regards to the capability of every region considering the expansion of mobile telephone infrastructures in Iran. To do so, the condition of every region should be studied regarding the level of technology and preparation and then the presenting services stage should be selected in such a way to have the most efficiency for citizens. This fact not only will increase the efficiency of governmental sectors but also will fulfill the citizens' satisfaction.

Notes

Each division of Tehran has its own municipality containing several different departments and agencies (Fig.5). Some of these departments are listed (Olfat, 2007) here: Dept of IT and Planning, Dept of Urban Planning, Dept of Civil, Dept of Traffic, Dept of Urban Services and Green Area, Dept of Disaster Management and Dept of Properties, etc.

Fig. 5. Metropolitan districts of Tehran city



References

1. Albayrak S, Wohltorf J, Fricke S, Hebler A and Noubissi Noukumo N (2003) Seconverging technologies and transition strategies. *DEXA 2005*, Copenhagen, Denmark. pp: 358-365.
2. Alrazooqi M and Silva R (2010) An m-Government solution proposal for Dubai Government. *Proc. of the 9th WSEAS Intl. Conf. on Telecommunications and Informatics*.
3. AOEMA (2004) E-Governance engineering - methodology for 3G beyond 3G service development. Working paper, *DAI-Labor of the Technische Universität Berlin*. 41(11).
4. Al-Khamayseh S, Hujran O, Aloudat A and Lawrence E (2006) Intelligent m-government: application of personalization and location awareness techniques. In: *Proc. of the EURO m-GOV*, Brighton, UK.
5. Al-khamayseh S and Lawrence E (2005) Mobile Government from a user's perspective. Hong Kong,

- China: Asia-Pacific Economic Cooperation (APEC) (No. telwg29/BFSG/14).
6. Bassara A, Wisniewski M and Zebrowski P (2005) USE-ME.GOV - A requirements-driven Approach for M-Gov Services Provisioning. In: Proc. of the Business Information Systems, Poland.
 7. Belanger F and Jannie SH (2006) A framework for e-government: Privacy implications. *Bus. Process Managt. J.* 12(1), 48-60.
 8. Borucki C, Arat S and Kushchu I (2005) Mobile government and organizational effectiveness. Process of the First European Mobile Government Conf., (Euro-Gov 2005), Brighton, UK.
 9. Cao TJ and Luee JT (2007) Application of M-Government system in Beijing Municipal Government. *IEEE Intl. Conf. on Systems, Man and Cybernetics.* pp: 3220-3224.
 10. Capgemini J (2007) the user challenge - Benchmarking the supply of online public services, 7th Measurement prepared for the European Commission, Directorate General for Information Society and Media, from http://ec.europa.eu/information_society/europe/it2010/docs/benchmarking/egov_benchmark_2007.pdf.
 11. Carroll J (2005) Risky business: will citizens accept M-Government in the long term? EURO m-GOV. Brighton, UK. pp: 77-87.
 12. Centeno C, van Bavel R and Burgelman JC (2004) E-Government in the EU in the next decade: The vision and key challenges (No. EUR 21376 EN). Seville: The European Commission's Joint Research Centre.
 13. Christensen T and Laegreid P (2002) Symposium on accountability, publicity & transparency. New public management: puzzles of democracy and the influence of citizens. *J. Polit. Phil.* 10(3), 267-295.
 14. Cilingir D and Kushchu I (2004) E-Government and m-Government: Concurrent leaps by Turkey. In *Proc. of the 4th Euro. Conf. on e-Government*, Dublin, Ireland.
 15. Clarke III, I (2001) Emerging value propositions for M-commerce. *J. Bus. Strategies.* 18(2), 133-148.
 16. Curbera F, Khalaf R, Mukhi N, Tai S and Weerawarana S (2003) The next step in web services. *Commun. ACM.* 46(10), 29-34.
 17. The National Electronic Commerce Coordinating Council (eC3) (2007) M-Government: The convergence of wireless technologies and e-Government. Lexington, Electronic references Retrieved Oct. 21 from http://www.ec3.org/Downloads/2001/m-Government_ED.pdf.
 18. Donegan M (2000) The m-commerce challenge. *Telecom. J.* 34(1), 34-44.
 19. El-Kiki T and Lawrence E (2006a) Efficiency in m-Government services: An evaluation framework. *WSEAS Transact. on Info. Sci. & Appln.* 3(2), 416-426.
 20. El-Kiki T and Lawrence E (2006b) Government as a mobile enterprise: real-time, ubiquitous government. *Third Intl. Conf. on Info. Technol.: New Generations (ITNG'06)*, IEEE CS.
 21. Fasanghari M and Samimi H (2009) A Novel Framework for M-Government Implementation. *Intl. Conf. on Future Computer & Commun.* pp: 627-631.
 22. Faya P (2001) E-Government, Literature Review, Management Priorities and Senior Personnel Secretariat. Government of Canada.
 23. Fidel R, Scholl HJ, Liu S and Unsworth K (2007) Mobile government fieldwork: a preliminary study of technological, organizational, and social challenges. In: 8th Annual Intl. Conf. on Digital Govt. Res.: Bridging Disciplines & Domains, Digital Government Society of North America, Vol. 228, pp: 131-139.
 24. Foghlú MÓ (2005) Infrastructures for Mobile Government Services. EURO m-GOV. Brighton, UK. pp: 192-199.
 25. Gang S (2005) Transcending e-Government: a case of mobile Government in Beijing. The First Eur. Conf. on Mobile Government, Brighton, July, Electronic references Retrieved Jan. 21, 2010, from http://www.mgovernment.org/resurces/euromgov2005/PDF/49_R132SG.pdf.
 26. Ghyasi AF and Kushchu I (2004) M-Government: cases of developing countries. M-GovLab, Intl. Univ. of Japan. Electronic references Retrieved Sep. 19, 2009 from www.mgovernment.org/resurces/mgovlab_afgik.pdf.
 27. Heeks R (2004) Using ICTs for government transparency- transparency definition page. E-Government for Development Electronic references Retrieved Apr. 13, 2006, from <http://www.e-devexchange.org/eGov/topic4.htm>.
 28. Hossan GC, Chowdhury M and Kushchu I (2005) Prospects of Using m-Technologies for Disaster Informaoin Management in Bangladesh and other LDCs, EURO m-GOV 2005, Brighton, UK. pp: 243-253.
 29. Ishmatova D and Obi T (2009) M-Government services: user needs and value, I-Ways. *J. E-Govt. Policy & Regulation. IOS Press,* 32 (1), 39- 46.
 30. Kaliannan M, Raman M and Dorasamy M (2009) ICT in the context of public sector service delivery: A Malaysian perspective. *WSEAS Transactions on Systems.* 8(4), 89-108.
 31. Kapogiannis G, Touzos M and Kreps D (2006) M-Business & M-Government: Co-operation. The Greek case study. In: Kushchu I, Broucki C and Fitzpatrick G (eds.) EURO m-GOV 2006 - the 2nd Eur. Conf. on Mobile Govt. Univ. of Sussex, Brighton, UK, 30-31 August & 1 September. pp: 154-159.
 32. Kim Y, Yoon J, Park S and Han J (2004), Architecture for implementing the mobile government services in Korea. *Telecom. J.* 43 (2), 601-612.
 33. Kumar M, Hanumanthappa M and Reddy BL (2008) Security issues in m-government. In: Proc. of the Intl. Conf. on Global e-Security (ICGeS 2008), London, UK, CCIS 12, Springer-Verlag, 265-273.
 34. Kushchu I and Borucki C (2004) A Mobility Response Model for Government. Electronic references retrieved Jan.12,2005,from,http://www.mgovlab.org/library/mgovlab/mgovlab_ikcb.pdf
 35. Kushchu I and Kuscu M-H (2003) From e-government to m-government: Facing the inevitable. In: 3rd European Conference on e-Govt., Dublin, Ireland. pp: 253- 260.
 36. Kwon Y (2004) Challenge to the Mobile Government. National Computerization Agency, Korea.

37. Luvangal BYS and Reejiraj E (2007) New Services - SMS makes way for instant messaging, mint, New Delhi. Electronic references retrieved July 3, p-11. http://epaper.livemint.com/ArticleText.aspx?article=03_07_2007_011_002.
38. Markellos K, Markellou P, Panayiotaki A and Stergiani E (2007) Current state of Greek E-Government initiatives. *J. Bus. Systems, Governance & Ethics*. 2 (3), 67-88.
39. May P (2001) Mobile commerce: Opportunities, applications, and technologies of wireless business. Cambridge University Press, NY.
40. Mengistu D, Zo H and Rho JJ (2009) M-government: Opportunities and challenges to deliver mobile government services in developing countries. *4th Intl. Conf. on Computer Sci. & Convergence Info. Technol.* pp: 1445-1450.
41. Naqvi SJ and Al-Shihi H (2009) M-Government services initiatives in Oman. *Issues in Informing Sci. & Info. Technol.* 6, 817-824.
42. Ndou V (2004) E-Government for developing countries: Opportunities and challenges. Electronic references retrieved Jan. 12, 2010, from <http://unpan1.un.org/intradoc/groups/public/documents/UNTC/UNPAN018634.pdf>
43. Ntaliani M, Costopoulou C and Karetzos S (2008) Mobile government: A challenge for agriculture. *Govt. Information Quarterly*. 25(4), 699-716.
44. OECD (2004) Country Factsheets. Paris: OECD/Public Governance and Territorial Development Directorate, GOV/PGC.
45. Olfat H (2007) The role of SDI in urban management, case study: The 8th Division of Tehran Municipality, Department of Urbanization, Faculty of Architecture and Urbanization, Iran Univ. of Sci. & Technol.
46. Pandya SC (2002) Short message service (SMS) Fervor sweeping India, Press Information Bureau (PIB), Government of India, Electronic references Retrieved Jun. 29, 2007 from <http://pib.nic.in/feature/feyr2002/fmar2002/f280320021.html> (accessed: June 29, 2007).
47. Patel I and White G (2005a) Technical implications and business recommendations for building open and interoperable platform for m-services provisioning. Paper presented at the From E-Government to M-Government, University of Sussex, and Brighton, UK.
48. Patel I and White G (2005b) M-government: South African Approaches and Experiences. EURO m-GOV 2005, Brighton, UK. pp: 313-323.
49. Reffat R (2003) Developing a successful e-Government. In: Paper presented at the Symposium on e-Government: Opportunities and Challenge. Muscat Municipality, Oman.
50. Rannu R (2003) Mobile services in Estonia. *PRAXIS Working Paper*. 8(1), 118-127.
51. Rannu R, Saksing S and Mahlaköiv M (2010) Mobile Government: 2010 and beyond. Mobil Solutions Ltd, Electronic references retrieved Dec. 17, from <http://www.mobisolutions.com>.
52. Rieger A, Simsek B, Wohltorf J, Varone N and Park MH (2003) 3G beyond 3G Services, Key factors for success. DAI Lab Publ., Denmark.
53. Richtel M (2005) Wireless deal for California Parks. In The New York Times. Published January 24, from <http://www.nytimes.com/2005/01/24/technology/24park.html?oref=login&th>.
54. Rossel P, Finger M and Misuraca G (2006) Mobile e-Government options: between technology-driven and user-centric. *The Electronic J. e-Government*. 4 (2), 79-86.
55. Sadeh N (2002) M-Commerce: Technologies, services, and business models. Hershey, PA: Wiley Computer Publ.
56. Sandy GA and McMillan S (2005) A success factors model for M-Government. EURO m-GOV 2005, Brighton, UK, pp: 349-358.
57. Saghafi F, Mohammadi N and Fasanghari M (2009) Mobile services model for diabetic patient based on 4C method. 2nd Conf. of Electronic City, May, Iran, 24-25.
58. Sathye M, Clark E and Dugdale A (2004) Fraud in e-government transactions: Risks and remedies. Technical report, Australian Government Information Management Office, Department of Finance and Administration. Domain site: [http://www.agimo.gov.au/publications/2004/05/e-Gov challenges/privacy/fraud](http://www.agimo.gov.au/publications/2004/05/e-Gov%20challenges/privacy/fraud).
59. Silvana T and Hong S (2008) Emerging trends in M-Government. Association for Computing Machinery. *Comm. ACM*, 51(5), 53.
60. Stormer H, Ionas A and Meier A (2005) Mobile services for a medical communication center - The e-Sana Project, the *First Eur. Conf. on Mobile Govt.* July. 387-394.
61. Suomi RB (2006) Five Finnish Innovations in mobile Government and their root factors. Paper presented at the COLLECTeR Europe, Basel, Switzerland, 9-10 June.
62. Trimi S and Sheng H (2008) Emerging trends in m-government. *Comm. ACM*. 51 (5), 53-58.
63. Tomas K, Filip M and Antonin S (2008) Mobile access, trends and technologies in modern information systems. *WSEAS Transact. Bus. Economics*. 5 (6), 113-124.
64. Van de Kar EAM (2004) Designing mobile information services - an approach for organizations in a value network. Delft Univ. Technol. Press, Netherlands.
65. VentureLine M (2005) the profitability of providing public services in C2B, Electronic references Retrieved Jun. 02, 2008 from http://www.ventureline.com/glossary_V.asp.
66. Vincent J and Harris L (2008) Effective use of mobile communications in e-Government: How do we reach the tipping point? *J. Info., Commun. & Society*. 11(3), 395-413.
67. Yu B and Kushchu I (2004) The value of mobility for e-Government. In: *4th Eur. Conf. on E-Government*, Castle Dublin, Ireland.