“Exploring factors affecting use of mobile government services in India”

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Exploring factors affecting use of mobile government services in India

Abstract

Over the last two decades, Indian Government, both at central and state levels, have been attempting to deliver electronic or web-based citizen services. There have been varying degrees of success and electronic government in India has been an area of extensive research. Given the very high teledensity in India and the penetration of mobile devices to larger masses, Indian Government today is exploring the use of mobile devices for offering citizen services and also to look at transitioning from electronic services to mobile-based service delivery. A new term mobile government is taking shape in India. However, mobile government is still in its infancy. A transition from electronic to mobile government in India requires the investigation of factors that could affect the use of mobile government services specifically in the Indian context. Experts have identified a number of such factors such as e-government strategy, cost, legal issues, social issues etc. However, these factors are likely to differ and vary across nations. This paper presents the findings of an online survey of Indian e-government experts on the factors affecting the use of mobile government services in India.

Keywords: mobile government, m-governance, mobile based G2C service delivery, e-governance, ICT in government.
JEL Classification: O38, H11.

Introduction

It is now well recognized that ICT based capture, processing, storage, organization and presentation of data and information facilitates a freer flow of information between government and citizens and opens up for opportunities for citizens to participate more directly. However, when it comes to use of mobile devices for offering of citizens services, the usefulness of mobile phones as the new interface between government and citizens needs to be feasibly ascertained. Also, questions on possible degree of success of use of mobile devices in offering services by Government would require a calculated answer to establish the rationale of mobile phone use. It is important to establish the usefulness of mobile devices to improve Government service quality parameters such as access, reach, adoption, interaction, costs and efficiency.

"Mobile government (m-Government) is a functional subset of all inclusive e-Government that utilizes the unique features of mobile and/or wireless technologies like cellular/mobile phones, laptops and PDAs (personal digital assistants) connected to wireless networks for provision of location based government services and information to officials and citizens/businesses at anytime and any place (24/7 Operational Model)" (Vikas Kanungo, 2007). M-Government refers to the use of ICTs by government institutions with the help of mobile technologies to deliver electronic services to the public (United Nations, 2007). M-Government can also be defined as "use of mobile and wireless communication technology within the government administration and in its delivery of services and information to citizens and firms".

Electronic Government involves the automation or computerization of existing paper based procedures that is prompting new styles of leadership, new ways of debating and deciding strategies, new methods of transacting business, new techniques for listening to citizens and communities and new strategies for organizing and delivering information. Electronic Government is rapidly becoming one of government's critical means for the provision of seamless services for public agencies, businesses and citizens. Globally governments have set very ambitious goals and are running costly programs for delivering public services electronically.

The IT industry and especially the software and services industry is growing very rapidly in India and worldwide. The traditional drivers for this growth are the banking, finance, securities and insurance sectors, followed by manufacturing and retail sectors. However, recently e-Government sector has been witnessing above average growth in India for the past few years. The National e-governance plan (NeGP) of Government of India has identified 31 projects as mission mode projects (www.mit.gov.in)

However, emerging trends make it clear that in the near future, there will be a strong demand for multi-channel service delivery. Moreover, the boom of the use of mobile phones, including Internet ready mobile phones, smart phones and personal digital assistants (PDAs) is forcing governments towards the deployment of mobile government (m-Government) (Sharma and Gupta, 2004). In the 21st century, mobility has become one of the most important technology and communication trends affecting all facets of modern life including mobile information systems, mobile payments, mobile commerce, mobile television and mobile government (Kiki and Law-

rence, 2007). Mobile Government refers to electronic government services capable of being delivered via mobile user interfaces, or in some instances, special mobile services such as location based services, provided by the Government (Suomi, 2006).

Indian telecom subscription base stands at 895.5 million (Wireless & Wireline) as on December 2012. The overall teledensity in India has reached 73.34% in December 2012. The teledensity in urban areas stands at 149.90% and in rural areas at 39.85%. The Indian telecom industry growth has not been restricted only to the higher sections of the society, now it is driven primarily by the rural market as well and the acceptance has been increasing considerably over the years. With a view to bridging the urban-rural divide and improving the economic strength of rural India, the government has brought inclusive growth for all sections of society onto the main platform. Telecommunications is a critical lynchpin in this endeavor and is likely to be a successful part of this agenda. The government is strongly promoting this effort through various large-sized budgetary allocations and the telecommunications industry also has a clear agenda of rural expansion.

Government of India has come out with a mobile governance framework document. According to an estimate approximately 50%-60% of government services in India can be delivered via mobile channel (Chandrashekar, 2007). Caroll (2005) in her study of Australian mobile phone users has reported that "Unless the services and applications of m-government meet citizens' needs, they will not achieve long-term, persistent use." After studying m-Government in Beijing, Song (2005) goes a step further and suggests that local government should pay attention to the new mobile technologies and their impact on organizations, and face up to the challenges and opportunities it offers to transcend the traditional e-Government model, a model which pays undue attention to online Internet portals. Some of the initial initiatives by Indian Government towards transitioning to mobile government, as evidenced by literature survey are listed below:

- Central Board of Direct Taxes, Government of India has launched SMS based services for Challan status enquiry.
- Indian Railways is offering mobile based railway ticket booking and enquiry facilities.
- One of the state Governments viz., Government of Kerala has launched Dr. SMS project to provide comprehensive information on health-related resources via the short message service (SMS).

The present study aims to explore and identify the factors affecting the use of mobile government services in Indian conditions i.e. to answer the primary exploratory research question on "What are the factors affecting use of mobile government services in India?"

The paper is organized as follows. Section 1 presents the literature review on factors affecting mobile government as identified by researchers from different parts of world; based on the literature review, section 2 highlights the motivation for research; section 3 gives the details of the methodology followed for survey. Section 4 presents the results of the survey; section 5 summarizes the conclusions and findings. The final section suggests the future research areas followed by acknowledgement and list of references.

1. Literature review

Researchers indicate that while mobile government is a concept in embryonic stage and management of mobile based governance process requires understanding of a wide variety of factors affecting the same. Omar Al-Hujran (2012) made a quantative study to enumerate the success factors in the implementation of m-Governance services in a developing country like Jordon. The analysis indicated trust, public awareness, cost, infrastructural constraints, and the lack of an enabling legal framework as the main factors impeding the complete realization of the m-Governance services.

Thunibat et al. (2011) conducted a exploratory study in Malaysia to investigate the potential needs of users of m-Government services and further find out various factors that have the potential to lead to the integration of the services provided with users' everyday practices. Their results indicated a high level of awareness of mobile government services but on the contrary a very low percentage of usage. The respondents were found to be stating problems relating to security, cost and quality of services, access speed, interface design and information updating. The study indicated to effective, cost affordable and convenience as the major issues impeding the success of adoption of m-governance services.

Al-khamayseh & Lawrence, (2006) have identified fully interactive m-Government success factors (for Europe). As a part of their research, they conducted a survey of experts using stratified purposive sampling. The order of the above factors as ranked by the experts is given below:

1. Privacy and security.
2. Infrastructure.
3. User needs and preferences.
4. Quality and user friendly applications.
5. E-Government.

6. Acceptance.
7. Cost.
8. Standards and data exchange products.
9. Coherent m-government framework.
10. High mobile penetration.
11. Infrastructure management.
12. M-Government awareness.
13. Access.
14. Strategy.
15. IT literacy.
16. M-Government portal and exclusive gateway.
17. Partnership with private sector.
18. Legal ussues: liberalization of telecommunications sector.

Jennie Carroll (2006) adopted a different approach to the research on success factors for mobile government. According to her, there are many difficulties in investigating the likely success of yet-to-be implemented services. Conventional requirements elicitation techniques such as asking whether participants want, or think they would use, a particular service are inadequate. This is because people's espoused theories are often very different to their theories in action and so what people believe they need or do frequently diverges from what they are observed to do. Typically, current use is investigated and used as the starting point for predicting or envisioning future use through designer introspection, future workshops or scenarios. Mobile technologies add to the difficulties, notably because of the influence of context on use and the likelihood of ad hoc user behavior (Carroll et al., 2003). An alternative approach is to examine current practices and to derive general lessons about the use of mobile technologies in the provision of public sector services. Such an approach is useful in defining a possibility space to focus future research (employing acting out, scenarios or prototypes, for example). Thus, implications for m-Government were induced from the findings. The following six lessons were derived:

1. The mobile phone was the technology of choice.
2. The use practices around mobile technologies are diverse.
3. The participants wanted to control the traffic on their devices and limit incoming information to meet their local, real time needs.
4. Current m-Government initiatives focus on one-way government to citizen interaction.
5. As more channels are added for interaction with the governments, trust must be built so that all channels are perceived to be trustworthy.
6. There are significant advantages of using personalized technologies for providing government services.

Tarek El-Kiki and Elaine Lawrence (2007) carried an expert's opinion survey on barriers to m-Government and opinion to overcome those. A web based survey was conducted to extract opinions. Analysis of responses identified three major areas of suggestions: organizational, technical and social. The barriers identified by them include economic and financial issues, lack of leadership, legal issues, vision issues, inter-operability, scalability, reliability, open source, accountability, transparency, openness, accessibility, participation, awareness, pricing, privacy, security, trust and usability.

Geoffrey A. Sandy and Stuart McMillan (2005) reviewed the available literature and identified six factors viz., cost, process reengineering, education, acceptance, security and access as critical to m-Government success.

2. Motivation for research

While literature exists for identification of factors based on studies across nations, to date, it appears that there is a dearth of the research foundation for identification and analysis of factors affecting m-government, specifically for Indian conditions The potential for mobile based government service delivery in India clearly calls for understanding the issues and challenges/factors affecting use of mobile Government services specifically in the Indian context.

3. Methodology

The exploratory study aims to use the expertise of professionals involved in mobile and electronic government viz., Telecom companies, Information Technology companies, consultants, academicians, researchers, Government officials etc. The study proposes to use an India specific extension to the approach adopted by Shadi Al-Khamayseh, Elaine Lawrence and Agnieszka Zmijewska (2008) in identifying success factors in Interactive mobile government. The purpose behind using an extension of their approach is twofold – one to start with an initial set of factors identified by them and second to compare the results obtained specifically for Indian conditions vis-à-vis the results involving experts from other geographies.

As the first step, a set of factors affecting mobile government as identified by researchers and practitioners globally have been listed using literature survey. The literature related to the following has been reviewed:

- strategy for electronic governance;
- strategy for mobile government;
- mobile government framework;
- legal issues in mobile government;

- electronic government and mobile government;
- assessment of electronic government initiatives;
- success factors for mobile government.

The set of factors identified by Shadi Al-Khamayseh, Elaine Lawrence and Agnieszka Zmijewska (2008) were found to be comprehensively covering factors identified by other researchers.

Based on the initial identified factors, the next stage of exploratory research involved a web based questionnaire survey inviting experts to respond. The authors chose a web based survey given the geographic spread of the respondents. The experts were requested to provide the demographic information along with contact details for future contacts/interviews, if required.

3.1. Sampling technique. The exploratory research is based on stratified purposive sampling. The target population of subgroups included expert groups from academics, research, communication companies, mobile phone suppliers, application developers, Government officials, consultants and NGOs. Academic database, journals and publications were referred to identify expert group from academics and research. Three types of telecom companies' viz., mobile service providers, telecom equipment manufacturers and mobile handset manufacturers were used as the target population for telecom expert groups. The expert group from Government was drawn from the civil list, directory of officials of Ministry of Communications and Information Technology and Department of Administrative Reforms and Public Grievances. The list of empanelled consulting organizations with the National Institute for Smart Government, Hyderabad was used as the sampling frame for experts from consulting organizations. The idea behind using stratified purposive sampling is to get in-depth, quality response from selected experts.

The seventy three (73) respondents who completed the survey included telecom professionals, IT professionals, government officials, academicians and consulting professionals.

3.2. The survey instrument. The survey instrument was an online web based questionnaire survey and around 130 professionals were approached with a web link to survey on www.surveymonkey.com. The e-mail sent to the identified target respondents also included a document on instructions on how to fill in the questionnaire.

The survey instrument had a total of eight questions. The first six relate to collecting the demographic information such as name, gender, age, sector employed, designation and organization.

The seventh question contained a list of eighteen factors which was presented to respondents in a randomized manner. The respondents were requested to rank these factors in the order of importance as applicable to Indian conditions. The ranking was required to be done from one to eighteen with one being the most important and eighteen being the least important factor for use of mobile government services in India.

The eighth question was an open ended question wherein the respondents were asked to add any other factor that they feel has been left out. Some of the respondents also used this question to provide remarks/feedback.

4. Survey results

The survey has been targeted to seek responses from cross-section of experts involved in e-governance and mobile governance viz., telecom, IT and consulting companies and also from academicians, researchers and non-government organizations.

4.1. Profile of respondents. Figure 1 shows the age profile of respondents. Nearly 48% of respondents are in the age group of 35-44 followed by nearly 25% in the age group of 45-54. The respondent percentage reflects that adequate seniority and experience exists in the respondent groups. 17.8% of respondents represented the age group of 25-34. The representation of respondents in the age group of 55-64 was 5.5% and for the age group of 65-74 it was 2.7%. 1.4% respondents represented the age group of 18-24. All respondents were from within India only.

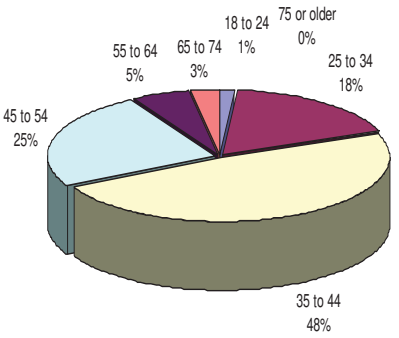

Fig. 1. Age profile of respondents

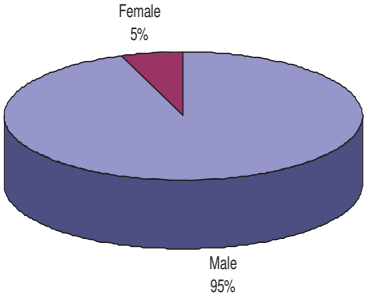

Fig. 2. Gender profile of respondents

In terms of gender, a majority of respondents (95%) were males. Only 4 out of 73 responses were from females.

Figure 3 shows the sector-wise breakup of respondents. Respondents from IT companies (29%) and consultants (29%) constitute the majority of responses. This could be due to the extensive working by these group in the e-governance domain. 18% of the respondents were Government officials, while academicians and telecom professionals represented 11% and 10% respectively. 3% were from other sectors. Overall, the respondent mix was a healthy one covering almost all of the sectors expected to be involved in mobile government.

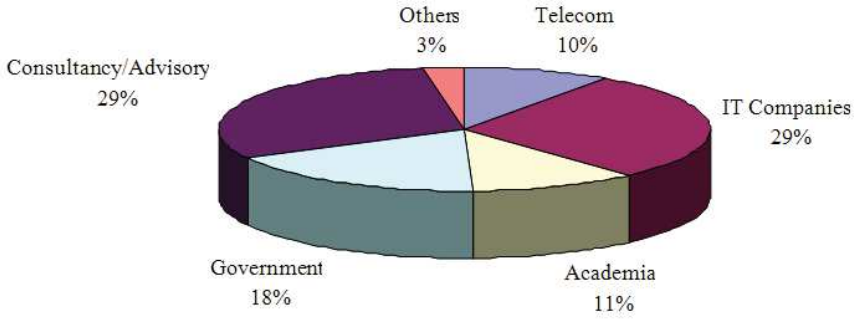

Fig. 3. Sector wise break-up of respondents

4.2. Respondents' ranking of identified factors. As mentioned above, the users were presented with an initial set of 18 factors based on extensive literature survey and asked to rank them in the order of importance as applicable to Indian conditions. The respondents were asked to rank them from one to eighteen with one being assigned to the factor considered as most important by the respondents and eighteen to the factor considered least important in Indian condition.

The users' responses have been analyzed based on average ranking assigned to each factor as tabulated below.

Table 1. Average ranking assigned by respondents to each identified factor

	Factors	Average ranking by respondents
1	E-Government (availability of e-Government services as a pre-requisite for mobile government services)	6.87
2	Strategy for mobile government	7.01
3	M-Government awareness (awareness of stakeholders about the availability of government to citizen services over mobile)	8.06
4	Users' access to mobile based services (e.g. availability of services over low cost handsets)	8.51
5	Quality of mobile government services and applications	8.76
6	Framework: availability and adoption of a mobile government framework by Government	8.90
7	Cost of offering and availing services over mobile devices	8.96
8	User needs: Addressing user needs and preferences – personalization of applications	9.16
9	IT literacy of stakeholders	9.27
10	Privacy and security concerns	9.36
11	Infrastructure: availability and use of telecom and mobile infrastructure for G2C services	9.53
12	Acceptance by users and change management	10.10
13	Mobile penetration/tele-density for wireless mobile phones)	10.39
14	Standards for mobile government applications	10.54
15	Legal issues (e.g. validity of mobile based G2C transactions)	10.63
16	Partnership of private sector (in mobile government application development and management)	11.17
17	Management of mobile and application infrastructure	11.89
18	Availability of exclusive mobile service delivery gateways and portals	11.90

5. Analysis of survey results

The order of factors as ranked by respondents in terms of applicability to Indian conditions indicate that the following five factors are considered to be most important in Indian conditions:

1. E-Government i.e. availability of e-Government services as a pre-requisite for mobile government.
2. A strategy for mobile government.
3. Mobile government awareness.
4. Users' access to services.
5. Quality of mobile government services.

The availability of e-Government services as a pre-requisite for mobile government has been ranked as the most important factor by the experts. This confirms that experts perceive that for mobile

government services to be used; the electronic delivery of services is a pre-requisite and may be indicative of a possible preference by experts for transition from electronic government to mobile government. Most researchers (D.C. Misra, 2010; Antovski and Gusev, 2005; Goldstuck, 2003) believe that m-Government should be an integral part of e-Government.

The need for a strategy for mobile government in India has been identified as the second most important factor. This may be indicative of the experience of experts about e-Government in India meeting varying degree of success on account of absence of a well-defined strategy and hence there is a perceived need for a well defined strategy for mobile government in India. The importance of strategy has been elaborated by a number of researchers and practitioners. The Working Group on e-Government in the developing world (Roadmap for E-Government in the Developing World, 2002) introduced "10 Questions E-Government Leaders Should Ask themselves" wherein strategy was the first question.

The user awareness about mobile government services has been ranked as the third most important factor by respondents. This is perceived to be a direct outcome of Indian experience of top-down e-Government strategy rather than creating a bottom up inclusive strategy.

Access to services has been identified as the next most important factor based on average rank. This can be related to the information that while the tele-density is highest in India, most of the users have access to low cost, low feature devices and hence access over these devices is perceived to be an important factor.

Quality of mobile government services is the fifth most important factor based on average rank as identified by experts. This also can be related to the experts' perception on need for good quality of mobile government services based on the experiences in quality of e-Government services offered so far.

Based on the above, it is perceived that experts perceive the availability of e-Government and the need for strategy, framework, access and quality as the key factors related to mobile government in India. Not surprisingly, teledensity and mobile penetration finds a low importance as enough has been achieved there. Surprisingly, the PPP and legal issues have been rated very low. However, this could be due to the non-availability of any embryonic experience in the mobile government space. Even privacy and security concerns have not been rated as a factor of high importance for Indian conditions.

It is also observed that the importance assigned to factors by Indian experts for Indian conditions is totally different from one identified by Shadi Al-Khamayaseh, Elaine Lawrence and Agnieszka Zmijewska (2006) wherein 81% of the respondents were from Europe. This confirms the authors' view that Indian specific factors are different from developed nations.

The respondents were provided with the option of adding any more factors that they feel are relevant to Indian conditions and not covered by the factors identified above based on literature review. The additional qualitative inputs received form experts towards addition of factors specific to Indian conditions are listed below:

- willingness and initiative of government;
- trust and responsiveness levels;
- availability of low cost smart phones;
- regulation on unification of numbers for mobile connections;
- local language application development.

The authors' feel that willingness and initiative of Government can be seen as a part of larger process of mobile government strategy. Similarly trust and responsiveness levels can be a part of the overall mobile government framework and low cost smart phones can be a part of infrastructure. The unified number can be seen under legal issues and local language application development can be perceived as part of users' needs and preferences.

Conclusion

This paper has presented the results of an online survey of Indian experts on factors affecting the use of mobile government services in India. The survey results are indicative of the following:

- factors affecting the use of mobile government services in India are different from the one identified by experts for developed regions;
- there is a need to focus on availability of e-Government strategy, availability of e-Government, access to users, improve awareness and ensuring quality of mobile government services. These have been identified as the top five factors affecting use of mobile government services in India.

Future work. The results of this survey can be used for exploring sub-factors under each of the identified factors in different geographical and demographic conditions in India to understand the dynamics of mobile government acceptance and use. Further work can be done to consolidate the findings of the survey.

A linkage of these factors to the effectiveness and quality of Government to Citizen (G2C) services can be explored as another area for research based on the above.

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