m-Governance ...Leveraging Mobile Technology to extend the reach of e-Governance

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Abstract:

m-Governance is not a replacement for e-Governance, rather it complements e-Governance. e-Governance is the use of information technology like WAN, Internet and mobile computing by Governance agencies, to transform private businesses and public agencies, as well as to empower the citizens. m-Governance, on the other hand, is the use of mobile or wireless to improve Governance service and information "anytime, anywhere". Mobile applications also rely on good back office ICT infrastructure and work processes. This paper shares the potential of using mobile phones as input devices in certain areas where last mile connectivity becomes issues for simple data inputs of critical importance for decision making in government departments.

Index Terms – Mobile Governance, Last mile connectivity, Simple data input devices.

1. Definition & Introduction

M-Government is part of a broader phenomenon of mobile-enabled development or leveraging the mobile revolution to enable development impact. It takes electronic services and makes them available via mobile technologies using devices such as mobile phones. These services bypass the need for traditional physical networks for communications and collaboration. M-Governance is a sub-domain of e-governance. m-Governance has the possibility to extend the reach of e-governance. e-Governance is the use of information and communication technologies (ICTs) to improve the activities of public sector organizations. m-Governance has the potential to help make public information and governance services available "anytime, anywhere" to citizens and officials. Mobile services are cheaper as well as accessible in most of the rural areas in India and/or Asian countries.

M-Governance is particularly suited for the developing world where Internet access rates are low but mobile phone usage is growing rapidly in both urban and rural areas. Globally, the number of mobile phones has exceeded the number of fixed/wired phones. This is also the case in many individual nations, including 49 middle-income and 36 low-income countries. This list also includes India.

2. M-Governance & e-Governance

m-Governance is not a replacement for e-Governance, rather it complements e-Governance. e-Governance is the use of information technology like WAN, Internet and mobile computing by Governance agencies, to transform private businesses and public agencies, as well as to empower the citizens. m-Governance, on the other hand, is the use of mobile or wireless technologies like cellular phones, laptops, and PDAs with wireless Internet connections to improve Governance service and strengthen people "anytime, anywhere". Mobile applications also rely on good back office ICT infrastructure and work processes: Governance networks and databases, data quality procedures, transaction recording processes, etc. But it is just the tip of an iceberg: just the final delivery channel to the citizen. Underneath is a complex infrastructure that is required in order to make that final delivery device work. Mobile growth statistics are now showing an increase of 60 to 80

lakhs per month in case of new connections and it is estimated that there are around 52 crore mobiles used in India as on December 2009.

3. Models & Examples

m-Governance is not a new concept. The **private sector** has been greatly leveraging the use of mobile phones for delivery of value added services for the following which however are mostly SMS based:

- **Banking**
- **Media**
- **Airlines**
- **Telecom**
- **Entertainment**
- **News**
- **Sports**
- **Astrology**
- **Movie Tickets Etc.**

We have also seen a few initiatives in Government sector using mobile innovatively which again are all SMS based:

- Food & Civil Supplies
  - ➢ Tracking Lorry Movements
  - ➢ Information on availability of Ration at FP Shops

- Irrigation / Water Resources
  - ➢ Reservoir Levels monitoring
- Urban Local Bodies
  - ➢ Grievance Redressal
  - ➢ Garbage dump removals
- Water Supply
  - ➢ SMS a water tanker
- Railways
  - ➢ Ticket Booking
- Examination Results and Mark Lists
- Agriculture
- Weather Reports, Market prices, seed availability etc.

International initiatives…a few examples include
- M-Dubai – 4488 – Push & Pull service
  - ➢ Civil Aviation – Flight timings
  - ➢ Police – Fines
  - ➢ Notification of Expiry of Trade Licenses etc.
- Singapore
  - ➢ Trade Licenses
  - ➢ CPF contributions
  - ➢ Road Tax Renewal
  - ➢ Passport Renewal
  - ➢ Government notifications
  - ➢ Consumer Price Index
  - ➢ Performance of the Singapore economy
  - ➢ Court Hearing
  - ➢ Track Traffic Information
  - ➢ Live traffic images
  - ➢ Public Works monitoring etc.
- Estonia
  - ➢ Mobile Parking
  - ➢ Mobile Transport Ticketing
  - ➢ Mobile Payments in Shops.

- South Africa
  - ➤ Cell-Life Update: Using Mobiles to Fight HIV/AIDS

- Disease Surveillance with Mobile Phones in Uganda

- Other initiatives
  - ➤ Emergency services
  - ➤ Traffic Information
  - ➤ Payment of Government fees
  - ➤ Child's Absence from School

Courtesy: mobilemonitors.org, www.praxis.ee

Other examples include Police department where wireless technology has always been an important part of law enforcement. In India, the Chennai City Traffic Police introduced a SMS service and a caution system for those violating traffic rules. "Through the SMS service, the public can inform the traffic control room about traffic accidents, vehicle breakdown and traffic jams". Also, the public can get detailed information before buying a particular vehicle that might have violated traffic rules by just sending an SMS with the registration and engine number of the vehicle.

Health and safety inspectors can now file their reports from the field in real time using mobile or handheld terminals, eliminating paper forms and the need to re-enter the data collected when they get back to the office.

m-Governance is not only about efficiency but it also allows for citizen activism. In the Philippines, citizens are able to help enforce anti-pollution laws by reporting smoke-belching public buses and other vehicles via SMS. SMS is also being used to get citizens involved in the fight against crime and illegal drugs.

4. M-Government Adoption: Mobile/Wireless Applications in Government

m-Government can be applied to four main purposes in the public sector, as summarized below:

4.1 m-Communication (G2C2G)
Providing information to the public is not a trivial activity. It is the foundation of citizen empowerment. Without relevant information citizens are unable to form intelligent opinions and, thereby, are unable to act on the issues before them meaningfully. Mobile devices provide an important access channel for governments to reach citizens (G2C). For example, Singaporeans can choose to receive SMS alerts for a variety of e-services such as: renewal of road tax, medical examinations for domestic workers, passport renewal notifications, season parking reminders and parliament notices and alerts. Citizens of Malta can register to receive SMS notifications of court sitting/hearing deferrals, license-renewal, exam results, and direct credit payments from the Department of Social Security. In the UK, the London police have included text messaging in their alerting service options. This service sends alerts to businesses in London about security threats, including bomb alerts. The 24-hour service contacts all users in real time with a message that is sent within 30 seconds of the alert being received by the police. Despite a monthly fee for the pager/text message service and the existence of a free email service there are more businesses that signed up for the pager/text message alerts (1,121 firms in total) than for the email alert system (589 firms). Such figures indicate the popularity of m-government services.
Aside from these opt-in G2C communications via mobile phones, SMS is also being used in emergency broadcasting. At the height of the SARS incident, the Hong Kong government sent a blanket text message to 6m mobile phones in a bid to scotch fears emanating from rumours about intended government action to stem the disease.

SMS is also a channel for citizens to communicate with government (C2G). In the Philippines, half of cabinet agencies have SMS-based services that allow citizens to ask for information or to comment and complain about government officials and services. In China, the 150 million mobile phone owners can now send SMS to the 2,987 deputies of the National People's Congress.

4.2 m-Services (Transactions and Payments)

SMS and other mobile devices not only provide a channel of communication between citizens and government, they also enable government-to-citizen transactions.

The Singapore government has decided to leverage the power of SMS for its goal of increasing population. Its Social Development Unit acts as an official dating agency for educated single people. It gives members 40 free messages over their mobile phones to allow them to contact eligible professionals. Singapore's National Library Board has also introduced an SMS service that allows regular users to query the status of their accounts and books borrowed, and receives reminders before the due date of their book loans. They can also undertake transactions such as making book renewals or paying fines using their mobile phones. The service costs each user $5 per year.

Other examples of the potential for the technology can be taken from industrialised countries:
• Norway's tax collectors have introduced SMS tax returns. Taxpayers who have no changes to make to the form they receive in the post can now simply send a text message with a code word, their identity number and a pin code instead of returning the form by mail. This new service benefits the estimated 1.5 million Norwegian taxpayers who normally return this income tax form by mail.
• In Finland, SMS tickets can be used for Helsinki's public transport system. These tickets can be ordered by sending a text message and the user is billed through his or her regular mobile phone bill. The ticket itself is also delivered to the commuter by SMS.
While the use of m-payment in e-Government is still limited, it is expected that as mobile payments systems evolve from simple payments for digital content and services to complex integrated handset, bank and operator payment. Its use for transacting business with government will also grow.

4.3 m-Democracy

Use of SMS and mobile devices for citizen input to political decision-making is an m-government application with tremendous potential to enhance democratic participation. At present, there are no significant experiments with m-democracy in developing/transitional countries, so evidence here is taken from experiences in the UK. Most of the UK experiments with electronic voting, including voting via mobile phones, are meant to discover more convenient ways to involve citizens in political decision-making.

Several concerns would have to be attended to before voting over mobile phones gains widespread acceptance. Questions of security and secrecy are top of the list. With the traditional voting method it is sufficient to present oneself at the polling (voting) station. An m-voting system has to ensure that the message sender is a registered voter, and that no-one abuses the system to vote more than once or vote in place of another person. Voters in Liverpool and Sheffield in May 2002 local elections were given PIN numbers to use if they want to vote by text message.

Another issue is to make the system as user-friendly as possible. If PINs are used, chances are many would forget their PINs if they are too long. Then there is the problem of using a phone keypad to key in parties or candidate names. Finally, the voting procedure itself must allow voters at any stage to repeat the instructions and choices. In addition, the capacity of the system would need to be sufficient to deal with peak periods because congested telephone lines are as frustrating as long lines in the polling stations.

However, these are 'technical' issues that may not be as difficult to overcome as voters' willingness to use mobile phones and SMS to vote.

4.4 m-Administration

m-Government also provides opportunities to improve the internal operation of public agencies. Again, there are few instances of such applications yet in developing/transitional economies.
Another potential for wireless technology is that it may provide a seamless environment for government employees to stay connected from any device. Up-to-date government-to-employee (G2E) information and services can be provided at any time, whether the data they need is on the Internet, on their network, or on a portable device under their control.
The other potential usage for m-Administration include:
- Health
  - Monitoring Progress – NRHM
  - Telemedicine
- Irrigation / Water Resources
  - Capturing Reservoir Storages
  - Monitoring Releases of water through Sluices
  - Monitoring Minors and sub minors area under a given Canal
- Electricity Board
  - Citizen Grievances
  - Bill Collections
- Public Works Monitoring

- Urban Local Bodies
  - Citizen Grievances
  - Bill Collections
  - Garbage Collection

5. Impact Of M-Government

An examination of a number of mobile government applications within various countries

shows that mobile business applications may not be easily applied to governmental administration, yet there are compelling reasons for doing so. Is it unreasonable for citizens, for example, to expect technology-enabled services from their government similar to the services available to them from private sector organizations such as airlines, banks and utility companies where flight reservations, currency exchanges and bill payments are now possible without human intervention? As such, there is an increasing need to introduce mobile technologies for governmental organizations. Mobile Government is one of the new and important developments in e-government. The high rate of mobile phone penetration opens a new channel for governments to reach their citizens fast and provide timely information to them. The features of mobile technology to be accessible anywhere, anytime make that possible. The promise of e-government to provide greater access to government information is progressing in many developed countries as the infrastructure is not a big issue and the adoption of e-government seems to be at a good pace. In contrast, the e-government adoption rate in developing countries is relatively lower. This may be mainly due to the lack of technical infrastructure in supporting government's efforts, as well as such factors involving cost of getting an Internet enabled PC, and ability of citizen's learning and accessing e-government applications: "readiness for adoption of e-government". Among others, such factors involving the readiness contribute largely to slow rate of Internet penetration in developing /under developed countries which subsequently may lead to e-government adoption problems. However, more and more mobile telecom operators are being active in developing countries and the demand for mobile phones is increasing continuously. The cost of owning a mobile phone is much cheaper than a computer with internet connection and the learning how to use a mobile phone is also simpler. The demand is huge, and so are the opportunities for the governments to reach the ever expanding network of citizens around country. A unified information campaign could be launched by government to advertise all its SMS- based services, will raise people awareness and use of these services. There is need to enhance the electronic linkages among offices within an agency and among government agencies.

5.1 m-Government in emergency situation

The Italian Ministry of Foreign Affairs, during the aftermath of the Asian Quake, sent a SMS to Italians located in the struck area. The message was: "Answer indicating your identity, health status, and place where you are". With approximately 15000 SMS the Ministry tried to trace Italian citizens who faced the disaster. According to official information, several hundreds replied helping the embassy and rescue teams to list affected people in the Tsunami area. The Italian Government obtained the list of people located in struck area from phone companies that provided the information based on the international roaming services. This is a real life example of how m-Government can help in such a situation.

According to the National Oceanic and Atmospheric Administration's center in Hawaii, the earthquake was detected and a warning about the approaching tsunami was sent to the Pacific Tsunami Warning Center. The reason that the warnings were unable to reach the millions in the disaster region is because none of the countries had a working tsunami-warning network.

The crucial part is the coordination among the technology experts, governments, and emergency response agencies not only in the tsunami hit region but all around the globe. Along with tidal gauges and sensors in the ocean, a well organized communication system, a well understood emergency preparedness, and training of resort operators, fisherman and public in general are at hand.

Mobile applications in disaster management will be one of the most useful and critical areas of implementation. It will be useful not only for the prevention activities such as mobile alerts but also an invaluable tool for the recovery efforts of, for example, rescue team working in the fields.

It is true that the system absolutely rely on the wireless communication channel that is not widely spread in several countries. Or some might give the fact that in Aceh right after the earth quake the all communication channel went down. But for prevention and life saving purposes, such system may give significant difference. The system should also be socialized to the public continuously so they can trust the information sent by the government.

In villages people are more comfortable with their local language so mobile application with local language support will add value to the efforts taken for m-Governance and increase the number of citizens to avail the benefits of m-Government. By leveraging the technology and mobile government implementation, there is a hope that in the future the impact of disasters can be lessen and more lives can be saved.

6. M-Government Benefits And Challenges

m-Government can bring potential benefits for the public sector, but it also faces challenges, as discussed below.

6.1 Benefits

The main benefit that m-government brings is its boundary-breaking potential: truly allowing working on an anywhere, anytime basis and helping to create a truly integrated digital nervous system for government. Because of its immediacy and convenience, it also reduces the barriers to public service operations, encouraging citizens or service providers to make use of the technology where previously barriers were discouragingly high.

These core benefits can be seen reflected in a broader set of m-government benefits, including:

Increasing the productivity of public service personnel: m-government allows public servants to enter data into digital systems exactly where they are in the field. Not only does this move data-gathering closer to real-time operations, it also reduces the time public servants spend on data activities, thus releasing more of their time for value-added, service-related activities. For example, where previously reports would be noted on paper in the field and then retyped back at base, they can now be entered direct, not only removing duplication of effort but also reducing the number of data errors. Increasing the effectiveness of public service personnel: public servants in the field currently have to make do with the data they carry around with them – in their heads or in portable files. With m-government, they can take the whole of digitised government with them into the field, allowing them to make much better-informed decisions and actions.

Improving the delivery of government information and services: m-Government can deliver data and services whenever and wherever the citizen is. This has a benefit to citizens – they can get immediate access to whatever they want no matter where they are. It also has a benefit to governments – for example in sending terror alerts or other very time-sensitive information, m-government provides the greatest chance of getting through quickly and directly.
Increasing channels for public interactions: m-government (where not used to substitute for other channels) provides an additional channel for interactions all stakeholders in governance – service deliverers, policy makers, service consumers, civil society representatives. This provides greater choice.
Lower costs leading to higher participation: the hope in relation to the political process is that, by reducing the time and effort of communication, m-government will encourage more communication, from e-voting, to contributions to political debates, to complaints or queries.

6.2 Challenges

mGovernment does face a number of challenges:

6.2.1 Cost: m-government tends to be yet one further channel for e-government, in which case it will create additional costs. This will continue until m-government can truly substitute for other delivery channels. Such substitution will be viable for applications within government. At least some governments have been able to adopt innovative costing strategies, for example, using fee-sharing arrangements that avoid the public sector having to provide many up-front costs.

6.2.2 mDigital divide: as just noted, not everyone has a mobile phone. In particular, older and poorer groups in society tend to be excluded from this technology. If there are benefits to be had from m-government, these groups will be denied them, and a challenge to m-government is to ensure it is not just one more way in which the "haves" benefit at the expense of the "have nots".

6.2.3 Mobile mindsets: mobile devices – cell phones particularly – are seen by many as tools more for fun and entertainment than for serious activities. Yet politics is a serious business involving difficult choices. Aligning these two mismatched worlds may be difficult. One sign already emerging of this underlying tension is the use of m-government systems for playing pranks, such as hoax messaging, encouraged by the anonymity that many mobile devices (which are often unregistered) offer.

6.2.4 Trust/security: if m-government is to encompass m-payment systems or other transactional public services, then it must have good security and must be trusted. As yet, there is still a credibility gap to be crossed for many mobile device users.

6.2.5 Data overload: mobile devices increase the pressures of a world in which users are permanently connected: "always on". These permanent connections increase the number of messages circulating and can create a blizzard of communications – some valuable, some not – in which public service communications can come to be devalued or lost.

7. M-Government Guiding Principles

Some guiding principles as discussed below.
Firstly, recognise that m-government is not a substitute for e-government. Not all applications can run on mobile devices nor should they. Not all wireless connections are cost competitive compared to wired connection.

m-Government should be conceived and developed as part of the overall e-government strategy and programme. The exact mix of m-government and traditional e-government applications depends on the unique conditions of each country. An important determinant would be the state of the nation's information infrastructure. It is easy to build expectations but difficult to regain trust. Citizens who are turned off by their experience with m-government are not only harder to lure back but will also bad mouth it to other.

Thus it is important to: Choose m-government applications wisely. Make sure they are non-trivial but also be careful that they are not the most difficult. Make sure that the application is user-friendly. Balance your need for information with the comfort (or frustration) level of the user with the technology.

In deploying m-government applications ensure that citizens get exactly what the application claims to be able to deliver in the shortest possible time. If it is a channel to receive complaints, be sure to regularly get back to the complainants about the status of their complaint until it is resolved. Boiler plate messages will not satisfy your citizens. Ensure that there are suitable back-office systems in place to deliver on m-government

promises. Partnerships, particularly with telecommunication companies (telcos) offering cellular services, matter. Telcos bring to the table greater knowledge about security, reliability, ease of use and affordability issues related to mobile applications.