Delhi Business Review ⩤ Vol. 4, No. 1, January - June 2003

" mGOV " IN INDIA

A PRACTICAL RESEARCH PROPOSITION UTILIZING THE TECHNOLOGICAL AND MANAGEMENT ASPECTS

M. Scalem

THIS paper uniquely proposes the concept of Mobile Governance (mGov) as an extension to the management of technology in Indian context. The paper emphasizes that the mGov ideology may be worked upon by effectively using the in-house technological advances and the already existing electronic governance (eGov) infrastructure. Taking the structure of the paper on the lines of, first introducing the concepts of eGov and mGov, the theories attached therewith, introduction of the comparative scope by studying eGov cases across some relevant countries, mobile technologies and how that would help bring a mobile revolution in India, the paper also proposes a basic implementable architecture as also the basic components of a typical mGov set-up.

Introduction

Much research has been done on the traditional approach regarding technology – Management of Technology (MOT) – towards a transversal and comprehensive vision of Technological Management (Chanaron & Jolly, 1999). Indeed, it is the technology which is the basic tool in the advancement of an economy but decision making and effective implementations of optimum decisions are the domain of management side. There is a set of active links between technology and all the other elements of the system like: research and development; finance; accounting/control; organisation and human resource management; marketing; operations; information systems; and law (Open University Systems Group, 1988). In other words, technology is impacted by and has an impact on those functions. The paper proposes that the concept of the organization may be extended at a country level; the difference being that while there are homogenous components in the former, there are heterogeneous components in the latter. Of course there are some differences but the basic structure remains the same. Hence any project should first be looked for it's feasibility across a group of organizations, viz., states, etc.

Electronic Governance (hence forward referred to as 'eGov') is one of the most important technology-management initiatives of the decade. The importance of eGov can be adjudged by its inherent advantages like real time connectivity, transparency, etc. It offers a new way forward, helping improve government processes, connect citizens, and build interactions with and within civil society (Heeks R, 2001). One can argue its success and critically speaking, there are basically two main types of eGov failure that can be identified from the available materials:

1. **Total failure** of an initiative never implemented or in which a new system is implemented but immediately abandoned. For example, Indira Gandhi Conservation Monitoring Centre was intended to be a national information provider based on a set of core environmental information systems. Despite more than a year of planning, analysis and design work, these ICT-based systems never became operational, and the whole initiative collapsed shortly afterwards (Puri et al 2000).

2. **Partial failure** of an initiative in which major goals are unattained or in which there are significant undesirable outcomes. For example, the Tax Computerization Project in Thailand's Revenue Department set out seven areas of taxation which were to be computerized. At the end of the project, only two areas had been partly computerized, and five others were not operational (Kityadisai 2000).

On the other hand, it could be the Mobile Governance (Referred to as mGov hence forward) which is more effective form of eGov for India, as it would enable webbing the whole territory. Already MIT (http://www.mit.gov.in) has done commendable initiatives in the area of eGov and this would be the ideal foundation for m-Governance, if worked upon. Eventually, the most striking advantages of mGov, making it the most lucrative technological aspiration for future, are:

- Public Safety Monitoring
- Delivery of mobile services
- Knowledge transfer
- Intra/inter community messaging
- Remote mapping and coverage
- Rural mapping and connections

e-Enabled Governance Theories

This definition of eGov as per Baltius (Baltius, 1999) emphasizes that eGov should be much more than just providing electronic services to citizens.

Figure 1: eGov Definition

The eCommerce could be of B2G, G2C or G2G type. However, is it only the sophisticated system backbone, developed tools that define the better eGov? Will these advanced tools sustain the standards and interests of the target audiences, i.e., the Citizens? Looking into the following theories of eGov, let us explore as to what is offered.

- The first theory of Rationality argues that the use of these technologies represents a major once-for-all improvement in the capabilities of governance and in at least the possibility of rationality in decision-making (Stevens and McGowan; 1985 and Tapscott; 1997). The price attached is the Cost of Investment and some running costs. However following the Famous Cybernetic Theory (Wiener; 1948), it is argued that the systems would more than repay their initial costs over their life (Reschenthaler and Thompson; 1996) as information decreases uncertainty, slows entropy, increases control by feedback and deviation correction (Overman and Loraine's Summary; 1994)
- The second theory of Pricing of Reason accepts the possibility of greater control, quality and rationality in the decision making but also the fact that it comes with an attached price. However these theories argue the need of safeguards, lest the price be too great in terms of Citizens Collective (Rabb; 1997), Citizens individual liberty and privacy, erosion of meaningful relationships among decision makers (Wilson; 1999), loss of commitment to decisions made on the advice of computer based neural net models and expert systems, due to the reduced user control and understanding of the model, and the larger numbers of options generated (Landsbergen et al; 1997)

These theories suggest that the authorities should look first into the eGov projects' feasibility before starting off. If it is the rationality, the proposed option of Mobile Governance is more feasible as a one time investment in a technology which is termed as the future technology and if it is the Pricing of reason theory, the transparency and instant connectivity ensure that the system is bound by its boundaries.

Relevant 'eGov' Cases

Surveys of eGov initiatives in the Developing Countries are incredibly rare; a shortcoming that needs to be addressed (Heeks R, 2000). However, let us take some relevant country specific case studies of eGov so as to cross compare and/or study the same in the current context. Although two eGov projects may never be identical

in scope or other aspects, a Cross-Country Study could be done for learning and implementing purposes. Cases of some relevant countries follow:

1. **United Kingdom:** In recent years, there has been an impetus in UK government to move towards the 'informatization' of public administration, involving increased processing of personal data for the provision of services and information to citizens. The UK case can be fit under the category of the following comment, 'Governments have aimed to learn from, but also to modify, the customer-oriented use of information found in the private sector' – (Bellamy and Taylor, 1998) It is estimated that at least £2 billion will have been spent upon 'Information Age Government' [IAG] by 2004 and its rationale is better, more efficient, more convenient delivery of services through the use of ICT (Information and Communication Technologies) and systems within a framework of 'modernizing government'. The electronic delivery of services to the UK citizen has been heralded in many policy documents and in current implementation work within central and local government (Bellamy, 2000).

2. **United States of America:** Starting from the directives of the US Paperwork Reduction Act, the federal government was obliged to offer all federal services and transactions online by 2003. Therefore, in late 1999, the president office issued a series of directives, which are referred to as the so-called 'e-Gov' framework. Within the framework of the eGov initiative, four areas were identified as critical for the implementation of eGov. First, transformation rather than just the automation of government was perceived to be an important principle for making eGov a reality. Second, to achieve eGov both public and private organizations were perceived to be needed. The third critical area was the infrastructure to ensure privacy and security for electronic government. Finally, the area of information and transactions in an eGov environment were seen as important issues. According to a study/survey undertaken for the Council for Excellence in Government in August 2000 (*http://www.excelgov.org*), all the groups of respondents perceived eGov to have enormous potential. However 65% still think that the eGov should be developed slowly as they are concerned about security, privacy, and the fact that many people do not have access to the internet and about 59% of them perceived limits to the eGov and were opposed to voting over the Internet. After making the basic government information available on the internet, the next step of the US federal government towards the eGov will be to give the citizens the opportunity to conduct all government transactions online. The objective is to offer citizens integrated services across different federal agencies so they can tailor government to their specific needs (*http://www.npr.gov*). By the end of 2000, nearly 40 million Americans were doing business with the government electronically. On a regular basis, people are accessing information to solve problems themselves through the Internet, via telephones, and through neighborhood kiosks.

3. **Singapore:** Singapore had launched its IT2000 Master Plan in 1992 even earlier than US. Then to compliment it even further it launched its 'Singapore ONE' initiative by virtue of which the implementation of a nation wide high capacity network infrastructure to which all Singaporeans are connected. For ICT-policy initiatives aimed at reforming national government departments and agencies, the Infocomm development Authority (IDA) can be seen as the responsible government agency towards facilitating better communications and transactions with the government through several of its initiatives like "One stop shop Government Internet Website" set up in 1995 and an "eCitizen Center" for 'one stop, non stop' online services and information. In 1999, a successor of the IT2000 Master Plan was introduced: 'ICT2' Master Plan and then in June 2000, 'eGovernment Action Plan' was presented through which it wants to become '…a leading eGov to better serve the nation in the digital economy' (*http://www.ida.gov.sg*). The action plan includes the following headers: Delivering integrated electronic services, Using ICTs to build new capability and capacity, Innovating ICTs, and being pro-active and responsive (*http://www.gov.sg*), (*http://www.ida.gov.sg*)

4. **Australia:** The first traces of the eGov thought processes can be located to the report of the Minister of Finance's IT Review group called as *Clients First. The Challenge for Government Information Technology* which concluded that there was room for reform in the area of the IT usage and development. To fulfill the government's commitment to have all appropriate government services available online by 2001, the Australian federal government presented its 'Government Online' strategy in April 2000 whose aim was to address the feedback that, "…people don't want, or need, to know how government is structured. They want to access the services they need, easily and safely" (*http://www.dcita.gov.au*). This strategy consisted of the following components: Improving the public access to a wide range of government services, especially by people who live in regional, rural and remote areas or older Australians and people with disabilities,

Access 24 hours seven days a week, reducing the cost of delivery of some government services, reducing bureaucratic and jurisdictional demarcation to provide unified services based on the user requirements and encouraging growth of e-business and associated opportunities.

5. **Italy:** AIPA (*Autorita` per l'informatica nella Pubblica Amministrazione*) was established according to the Labour Decree n. 39/93 in Italy and its main tasks are promoting, co-ordinating, planning and controlling the development of information systems within the government central organizations and agencies, through their standardization, interconnection and integration. The approach adopted by AIPA could very well be classified under the following categories: Assessment Phase, Planning Phase, Implementing Phase, Feedback and Checking Phase. However, inefficiencies do exist given that there is a high level of fragmentation of responsibilities and numerous interruptions of processes, even inside the single administration. A Public Administration's Unified Network (*RUPA, Rete Unitaria Della Pubblica Amministrazione*) was created by AIPA as the main inter-sectoral project, in accordance with the directives of Labour Decree n. 39/93. Its target is "to guarantee to any authorized user the access to data and procedures residing within the automated information systems of his/her own or other administrations regardless of the networks they cross and of technologies adopted by the single information systems.". The basic qualities provided by the unified network are as follows: Connectivity, Interoperability and Co-operation.

6. **India:** Despite all the country's progress in the IT sector, cyberspace initiatives, India still lags considerably in global indices of human development and information society parameters. While the "IT triangle" of the cities Bangalore, Chennai and Hyderabad is showing good progress in eGov, other areas although in the race, can't be classified as the ones who are fast catching up. According to a recent NASSCOM-McKinsey report (*http://www.nasscom.org*), the eGov infrastructure and services sector in India is $1 billion market for IT vendors, software and training companies. Thus although there is a huge incentive for the corporates to venture in this arena, the current scene justifies our claim that the eGov status in India is in want for more, plainly speaking.

   Current Online services provided by the Indian government's National Informatics Centre include passport application, registration procedures, school exam results, trade guidelines, telemedicine, customs EDI, and the Land records computerization in Talukas (administrative unit). But the average citizen's statistics are to be seen and then studied critically. The non-availability of relevant online data is again a hindrance for critically taking this issue in this paper. Based on the active interaction and interviews with several IT Secys, Governors, IAS officers, and average citizens, the author hypothesizes that for the eGov or for that matter mGov to be successful, some element of e-Commerce/ m-Commerce (eCom/mGov) should be taken into account. Right now this is not fully there or is there is none at all. A simple example was cited by a high ranking Rural Development Official that there is no incentive for a farmer to go to the e-gov site? "…*If it would have been that the rates of fertilizers, crop details, online help about the problems etc were there, then may be the 'average illiterate citizen farmer' may have happily embraced the portal and its contents!*" That's one case of rural governance. For urban areas, however, the most critical issues are TIME and EASE. NGOs and voluntary organizations, like "Grameen Sanchar Society" etc are expected to play a key role in taking the Net/Mobile governance tools to rural areas, as well as in compiling traditional knowledge in sectors like medicine, cuisine, and folk culture. For eGov, while Internet backbone costs are coming down, last mile costs are still high in India, thus leading to low penetration of phones and Internet. By way of comparison, India with a population of over a billion has only 25 million phone connections – as compared to China which has 150 million phone connections today increasing at the rate of almost 30 million new phone connections each year. The current spread of the mobile phones and the mobile gadgets in India implies that this is one market which has great scope and hence the use of such fast growing backbone could be utilized for the quick implementation of mGov.

Thus, although a number of similarities undeniably exist between the eGov developments in the above mentioned countries, it still leads on to the fact that there is no so such thing like 'a single, worldwide model of eGov'. However given the technological revolution, it is now only a matter of time before we see it.

Report on 'eGov'

More than 60 percent of eGov initiatives fail or fall short of their objectives, according to a study by analysts at Gartner Inc (Matthews W, 2002). eGov often takes more money, planning, leadership and sustained focus than

government officials anticipate, and without those key ingredients, eGov initiatives are likely to falter, Gartner analysts concluded. Perhaps the most difficult impediment for eGov is the structure of traditional government. A Gartner survey found that national-level governments average 160 departments or agencies which function at different levels of government, each operating according to its own laws and policies, thereby creating problems for eGov.

When we hypothesize that eGov is not as successful as was thought to be while starting off its implementation, it is the current trend of overlooking the fact that well organized human resources are a major requirement in obtaining the highest profit from the potential of technology. Thus, technological and organizational innovation must go hand in hand (IMIT, 1996).

Funding is the main stumbling block for eGov initiatives. Lack of adequately skilled personnel is another common problem. For eGov, the personnel are required who not only adapt to change quickly, but also drive change. Nevertheless, 40 percent of eGov initiatives succeed. The report identified "five imperatives" for eGov successes: Maintain focus on the goal, Find capable leadership, secure adequate funding, invest in the building blocks, and maintain constant pressure for continued progress. The same would have to be taken for success in the eGov initiatives.

mGov Revolution

mGov with an element of m-commerce promises to bypass the fixed physical locations and offers valuable tools for enhancing communication, collaboration and co-ordination, reducing transaction costs and improving the efficiency of markets through making information available on any device, anywhere and at anytime. The applications are virtually endless. The process of convergence is unstoppable, creating new technological, business and cultural opportunities. The need is to harness the opportunity when it is novel so that with time the tuning is done automatically.

Ubiquitous access to information, anywhere, anyplace, and anytime, will characterize whole new kinds of information systems in the 21st Century. These are being enabled by rapidly emerging wireless communications systems, based on radio and infrared transmission mechanisms, and utilizing such technologies as cellular telephony, personal communications systems, wireless PBXs, and wireless local area networks. This is an emerging field, and builds on radio engineering, data communications, computer networks, distributed systems, information management, and applications. The focus is shifting from a desktop-based solution to a fully mobile solution. That is, while desktop solutions increase productivity when the user is sitting at a desk or with a laptop, mobile solutions provide the freedom from time and place that enables productivity gains beyond the tethered solutions. While m-business has traditionally been focused on the "highly-mobile" professional subset, mobile B2E solutions are now being targeted to a wider community (*http://www.pwcconsulting.com*).

Wireless connectivity is fast becoming the key enabling technology of the new millennium. The most important aspect is to choose technologies and build applications with today's needs and limitations in mind, but with an eye on tomorrow's possibilities. A sound wireless strategy lies at the intersection of technological feasibility and economic viability. The recent progress of wireless communication and personal computing leads to the research of ad hoc wireless networks (Royer E M and Toh C-K, 1999) – One of the tools of the proposed mGov.

mGov in Indian Context

In the context of the discussion, an important question arises, specifically in context of fast developing nation like India: Why mGov? The solution is quite obvious. Today's situation in India is like that even the PC penetration is quite low, in spite of the high growth of the same, not to say the low GDP. The territory of our nation is such that the PC penetration is not at all feasible in the coming time also, realistically speaking. So even if we go for eGov the result would be a high investment but less facilitation to the target audience. The latest interest levels and feasibility of the mobile technology is the perfect solution for us. We can take advantage that even in the developed countries; they are slowly thinking to implement the same. As is our mission that we would be an IT power by 2008 including the e-equipped government also, mGov is the solution, a tool as well as the problem depending on which side of the coin we are looking into. Since mGov is being facilitated through the human element, it may be iterated that although the issue of human element and technology is not a new one (Allen, 1977; Kleingarten & Anderson, 1987), it is currently undergoing significant renewal with the emergence of

pervasive new technologies, especially in the field if ICT and kind (Ettighoffer & Blanc, 1998; Townsend et al, 1998) as also the mobile technologies. However the caveat remains on the human adaptability. A well-established body of literature deals with such impacts of technology on people and organisations – for example, the effects of mechanization or automation. It shows how important it is to pay attention to human issues when it comes to the implementation of a new technology.

First of all the rural and remote areas have to be mapped by virtue of mGov and then simultaneously move on to make the approach to the urban areas for the Facilitator Company/corporate house to break even. The high initial implementation cost is the main reason why this platform may not be strictly restricted to the Government services only, but rather the high investment can only lead to profits in the long run when the platform is used for all kinds of electronic services offered. A generic model of mGov for India is shown below.

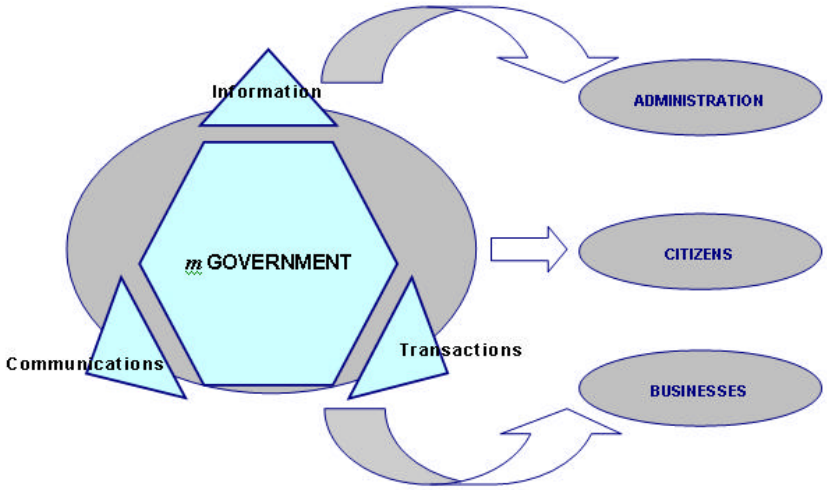

Figure 2: A Generic Model of the MGov

The respondents interacted so far, say that the governance should not only be a collection of data, online data display or generate statistics. As sharing is a two way process, need arises about the governance reaching to masses and vice-versa. While the eGov implies the people to reach for the information, mGov would be making the technology come to target audience and make the governance within reach. It is iterated that for the existing eGov would be the critical backbone while implementing the mGov to make the effective de-centralized and two-way governance as discussed earlier.

Hence the proposed definition of mGov in Indian context, hence, is as follows:

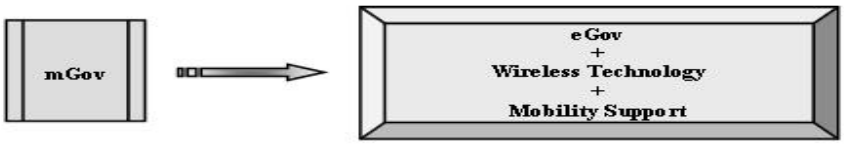

Figure 3: mGov Definition

Since the penetration of PCs and Internet is quite low in India, given the fact that the territory of our country has areas which are very difficult to map even by telephones, the same justifies the use of 'Wireless Technology'. However it does not mean that there would not be wire lined backbone. However the 'last mile' is proposed to be the wireless. Since I am proposing the wireless technology and mapping of remote areas and rural areas, the concept of 'Mobile Support' comes into picture. Instead of the citizens coming down for information, mobile

support would ensure that the technology acts as a facilitator. A typical (proposed) model mGov project, in Indian context, could entail:

- A Pilot-Project Scheme,
- A parallel Research Program on mobile technology, and
- A nation wide advertising and awareness campaign.

It is proposed that use be taken of 'Mobile PCO Booths' for the penetration of mGov and the possible scope of the mobile service providers (MSPs) to provide the nodal mobile coverage in addition to the simultaneous development of applications for PDAs and mobile cell phones to take-in the literacy and linguistic tastes of the areas.

The most important management function is to formulate an optimum strategy and since the technological considerations impact on both external and internal aspects of strategy, the technology management itself becomes an integral part. In this context, technology strategy should be considered as an integral part of business strategy and planning, rather than as a separate process (Floyd, 1997, Matthews, 1992 and Metz, 1996).

Justification of the Mobile Technology

The access to traditional Internet Computer Technologies such as Desktop Computer Technology is severely limited in the countries like India where even the access to 'landline' telephones is problematic insofar there are only approximately 3.0-3.5 Crore installed telephone servicing a population in excess of 100 Crore persons. The lack of access to technologies such as desktop computers need not however be the limiting factor with respect to potential initiatives for electronic government.

There already are breakthroughs in the mobile and wireless technology and the technologies are fast been implemented. Some of the best known technologies are:

- Ad-Hoc wireless Networking
- Sensor Networking
- Wireless Local Loop
- Wireless Application Protocol
- Bluetooth Technology & 3G Wireless
- Wireless Markup Language
- Mobile Portals
- Cellular technology and SMS services.

The most attractive alternative is now the use of mobile phone and PDAs. The potential extent to which the mobile telephone technologies may be utilized in electronic government initiatives has not yet received much attention in our country. However, the commercial initiatives are gaining rapid pace with cell phone banking initiatives using Wireless Internet Gateway [WIG] technology at the forefront of developments. Also the option to go for mobile-PCOs instead of the regular landline phones is very feasible for rural and remote areas. Mobile technologies may provide one of the solutions to the ongoing debate regarding the strategies to overcome the 'information divide' in the contemporary world, specifically due to their rapid penetration in all markets throughout the globe including those of developing and partially developed states.

As the functionality of PDAs and mobile tools improve with rapid advances in technology so too will their relevance as a 'great equalizer' become apparent in providing access to information and services via eGov and commercial initiatives. Mobile technologies have the potential, in conjunction with other converging technologies, to be one of the strongest catalysts in maintaining and faciliting democracy and democratic processes on a global scale. Drawing the parallel with the comment that the lack of infrastructure is often a catalyst which leads to a growth in technologies such as cellular telephony as can be witnessed in countries such as Cambodia, Brazil and South Africa (Poor Countries are…, 1996), one can safely extrapolate that mobile revolution is going to be the future technology for all.

The technological difference between the eGov and mGov could well be understood through the following diagram:

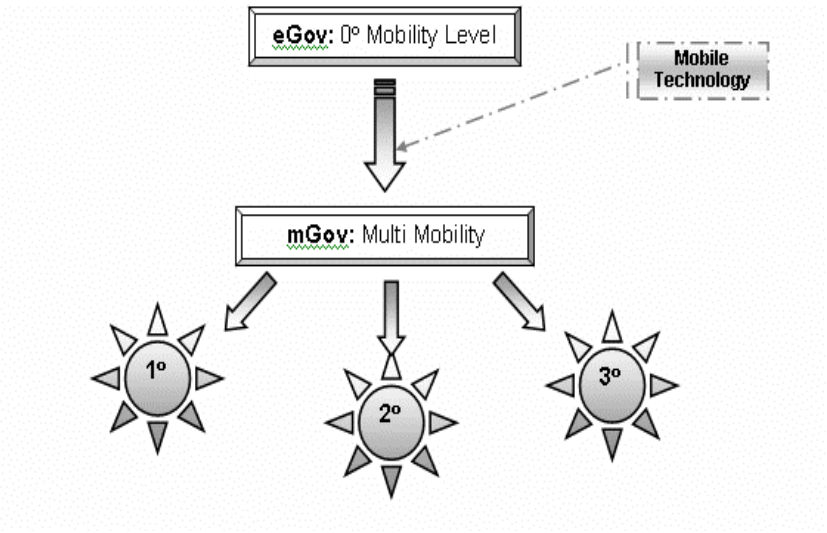

Figure 4: Representation of eGov and mGov

1. **[0º Mobile Traversal]:** The bottom line of this point is that the user would visit Kiosk having some database connected to main database and ask information there. [Analogous to eGov]

2. **[1º Mobile Traversal]:** The bottom line of this point would be that in this phase, users would connect Kiosk operator through cell phone to ask information.

3. **[2º Mobile Traversal]:** The bottom line of this point is that the users carrying PDA, handheld devices running applications connect to Kiosk machine and access the database directly to get information without taking help of kiosk operator)

4. **[3º Mobile Traversal]:** This phase is based on the AdHoc networking concept, in that, the necessary physical interception of Kiosk operator etc is done away with. The citizens would be able to log on or connect to the main server at the Kiosk through cellphone-to-cellphone hops. Here the main feature is mobile connectivity and dispensation of information.

Proposed Model Architecture

The various components of a typical mGov project's architecture could be as per the list below:

1. Terminals/Kiosks [Information Terminals]
2. Optimal Graphical User Interface [Icons/Contents Based]
3. Telecommunication Network [Client-Servers/PDAs/Mobile Phones/WLL Phones]
4. Chip Cards/ Smart Cards [Plastic Money]
5. Database Backbone/Server [Oracle/Access]
6. Direct Hotline/Helpline [Real Time CRM]
7. City/Rural Area Information System [GIS Mapping, Weather Forecasting]
8. Service provider interface [Private Information; mCom features]
9. Certifying agency [Trust Center, validity Checks of contents]

An mGov set-up architecture is proposed in the Indian Rural Context, which is reproduced below. The diagram

is quite self explanatory.

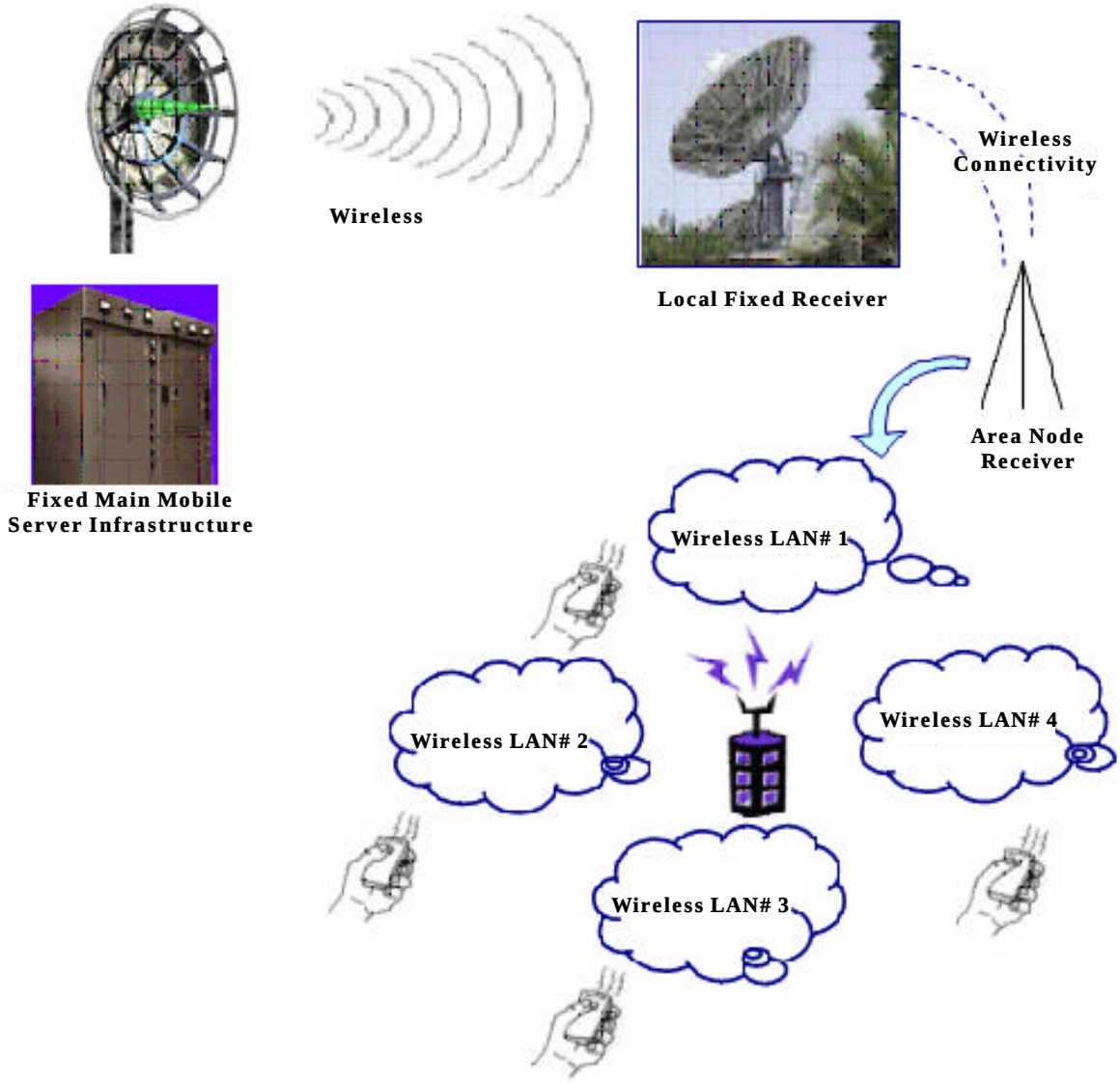

Figure 5: Technological Infrastructure Architecture Layout

Some of the components of the same are discussed below:

1. Rural/ Remote Area Wireless Networks based on AdHoc Networks, Sensor Networks and Pervasive Networks based on single hop and multiple-hop wireless architectures. In the Single hop wireless architecture, the last hop is wireless and the rest of the network wire lined. Multiple-hop networks are pervasive, ad hoc, sensor networks in which few network components are connected among themselves in many hops in wireless connections and finally are connected to the wired environment.
2. Architecture of the practical implementation, viz., star, mesh, AdHoc, hierarchical etc. For the example of mesh/hierarchical architecture: mobile terminal (cell phone), PDA, or Hand-held devices will call or connect to nearest calling center (say) that is connected to base station of service provider who will be the gateway

to external world of internet or any corporate or captive network. The external network is mostly wire line connected network.

3. Simultaneous or parallel Applications Development on the basis of nature of applications running on types of mobile devices and several predefined parameters like data centralization, data distribution, kind of data, data mining techniques, intermediate interfaces etc.

Scope for Future Research

In addition to the information and resources, the mGov for the future should be cost efficient and use high standards for security and authentication. Technical standardization together with the development of common standards, are important means to accomplish these objectives. However, the exact blue print of the mGov is still vague, or more clearly speaking: Under the process of beta testing. The inherent specific cultural barriers within the countries under study lead to the unclear picture of the potential future mGov model. Although the future is very bright on onset for mGov, there is a need for a precautionary approach as the mGov would be successful based on the contents and how they are presented. For that it is pointed out that there is an immense need for area based applications development taking in the area specific language, literacy, habits, etc. A popular and often quoted draw back for the mGov can be discussed on the technological specific front that WAP Services (Wireless Application Protocol Services) are often referred to as based on technology which is often expensive to implement and which has limited rewards. But as new Mobile or Cellular Technologies develop such as General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS) they are likely to become more suitable for large scale mGov mapping. Already work on the fronts of 3G, AdHoc networking, etc is showing considerable potential. The research scope on the technological front as well as the strategic front is quite enormous in the Indian context.

The prevailing patterns of using IT are far from exhausting the inherent potential. It is an urgent task now for the research community to develop reference models inspired by visions of a modern public administration and of the potential of IT. Basic notions like administrative jurisdiction and the territoriality of the public administration need to be addressed while designing the pathway for mGov. An inherent problem with both eGov and mGov is that it cannot fully replace conventional government services, because not every body can be connected by internet or PDAs/Mobiles. However mGov promises far much more accessible than eGov because of its wireless connectivity and mobility. The research has showed that there is a growing divide between people with and without internet/connectivity access. Bridging this divide has therefore should be given a top priority. This could be treated either as a research problem or as a benchmark for the future implementations.

Conclusion

Most of the related work on the technology and management related research projects and publications could be clustered into the two main research tracks (Chanaron et al., 2001), namely:

- Managing technology as an activity, and
- Managing technology as a resource.

This paper focused on a practical research proposal on the aspect of techno management of the mGov. First the existing techno-management literature is presented in perspective, e governance theories are then presented to make up for the theoretical think processes, then eGov case studies of some relevant countries are taken up vis-à-vis India for the cross comparison purposes. To supplement why the eGov projects are not up to the mark, the facts are supplemented through the Gartner study. The mobile scenario and the Indian context for mGov are discussed next. The technological side was discussed by discussing some of the mobile technologies relevant to the mGov project. In the end a model for a mGov node is proposed for practicality purposes adding on the claim that the same is not at all expensive given the benefits.

Some of the main points of this research proposal can be tabulated as follows:

- Developing countries notwithstanding, it was found that even in USA, the eGov revolution has fallen short of its true potential. As it stands right now, which admittedly is early in the revolution, there are problems

of access and democratic outreach that need to be addressed. On the other hand the mGov concept being a bi-directional contact, offers the possibility of bringing government closer to citizens or vice-versa, making it more convenient and more cost-effective.

- This paper strongly emphasized the need for the instant information availability for rural, remote, disaster prone areas that could only be covered instantly by the mobile technologies.
- Another thinking process of the author is towards the line that first the mGov is implemented and tested in rural areas and then the same is extended to the urban areas for breakeven (in case the facilitators are corporate houses) and remote areas like forests, accident prone areas, socially unstable areas, etc (in case Government of India is the facilitator) as the needs and requirements are totally different for different sectors and areas.
- It is also proposed that instead of the Government of India's sole participation, on the long run the corporate houses and other private avenues should be involved as this would mean substantial benefits to all the partners. The Public Administration can double its funds for modernization using new Information Technology. This would mean a push for reform initiatives. On the other hand, local business benefits from more convenient and easier access to government services as well as customer reach. But in the meanwhile the onus should not be on profits but rather, on the mapping of the rural areas, remote areas like forests, disaster prone areas, riot prone areas, etc and the same could easily be done only through the mGov implementation utilizing/ working upon the already existent eGov infrastructure. Better access to government information and services for all citizens equally, can be seen as the main motive for the implementation of the mGov.

To summarize, there is much potential left for the eGov to enfranchise a much greater portion of the population than the dismal proportion that currently falls under the category. While improving government's efficiency, we must take care not to skew the benefits in favor of those traditionally more enfranchised groups. It is for the un-enfranchised groups that mGov is being conceptualized in the Indian context.

On the lines of extrapolating the organization experience to even bigger concept of country levels, it was studied (Cardozo, 2001) that the new technology-based ventures face seven principal obstacles to growth: (1) lack of vision for the business, (2) objectives and risk preferences of startup teams, (3) difficulty of identifying a 'right' size for the business, (4) inappropriate timing of growth, (5) trying to grow too quickly or too slowly, (6) inappropriate product-market choices for growth, and (7) inability to assemble and deploy intellectual, human and financial resources effectively. If indeed IT projects are to be made successful it may not only be due to technological supremacy but rather it depends heavily on the managerial decision/policy making and the implementability studies.

That may either be construed as a challenge or a research proposition, depending to what side of the coin we are looking. The novelty comes from the fact that even in developed countries they are thinking to study mGov scope. That we are the fastest developing IT nation may help by facilitating the mGov node/project. The proposition is also a solution to cater to the ever increasing mobile demands of the citizens as well as rural and remote area inhabitants of India.

References

Allen T.J. (1977) "Managing the Flow of Technology", Cambridge (MA): MIT Press.

Balutis A.P. (1991) "Digital Government – When All is Said and done", Electronic Government Journal, Vol. 2, No. 6, November.

Bellamy C. (2000) "Implementing Information-Age Government: Principles, Progress and Paradox", Public Policy and Administration, Vol. 15, No. 1, p29-42.

Bellamy C. and Taylor J. (1998) "Governing in the Information Age", Buckingham, Open University Press. January.

Cardozo Richard N. (2001) "Technological Management: Obstacles to Growth of New Technology-Based Enterprises", IAMOT Online Journal, December.

Chanaron Jean-Jacques, Dominique R. Jolly, and Klas Söderquist (2001) "Technological Management: A Tentative Research Agenda", Founding Conference of the European Academy of Management, European Management Research: Trends and Challenges, April 19-21, Barcelona.

Chanaron J.J. and Jolly D. (1999) "Technological Management: Expanding the Perspective of MoT", 8th International Conference on "The Management of Technology", MOT 99, IAMOT, Cairo, Egypt, 15-17 March.

Ettighoffer D. and Blanc G. (1998), "Le Syndrôme de Chronos", ('The Chronos Syndrome', in French), Paris: Dunod.

Floyd C. (1997) "Managing technology for corporate success", Gower, Aldershot.

Heeks R. (2001) "Understanding eGov for Development", Information Technology in Developing Countries, Volume 11, No. 3.

IMIT [Institute for Management of Innovation and Technology] (1996) International Transfer of Organizational Innovation, EIMS Publication No. 45.

Kitiyadisai K. (2000) "The implementation of IT in reengineering the Thai Revenue Department", Information Flows, Local Improvisations and Work Practices, Proceedings of the IFIP WG9.4 Conference, Cape Town.

Kleingartner A. & Anderson C.S. (eds) (1997), "Human Resource Management in High technology Firms", Los Angeles: Lexington Books.

Landsbergen D., Coursey D.H., Loveless S. and Shangraw R.F. (1997) "Decision quality, confidence and commitment with expert systems: An experimental Study", Journal of Public Administration Research and theory, Vol. 7, No. 1, p131-157.

Matthews W. (2002) "Measuring e-gov", Federal Computer Week, Dated 8th April.

Matthews W. (2002) "Study: E-Gov prone to falter", Federal Computer Week, Dated 6th May.

Matthews W.H. (1992) "Conceptual framework for integrating technology into business strategy", International Journal of Vehicle Design, Vol. 13, No. 5-6, p524-532.

Metz P.D. (1996) "Integrating technology planning with business planning", Research-Technology Management, Vol.39, No. 3, p19-22.

Open University Systems Group (1988) "Systems Behaviour", Third Edition, London: Paul Chapman Publishing.

Overman E.S. and Loraine D.T. (1994) "Information for control: Another Management proverb?", Public Administration Review, p193-196.

"Poor countries are fertile ground for a revolution in communications" (1996), The Sunday Independent, Dated. May 26.

Puri S.K., Chauhan K.P.S. and Admedullah M. (2000) "Prospects of biological diversity information management", Information Flows, Local Improvisations and Work Practices, Proceedings of the IFIP WG9.4 Conference 2000, Cape Town.

Rabb C. (1997) "Privacy, information and democracy", in Loader BD (ed.) The Governance of cyberspace: Politics, Technology and global restructuring. London: Routledge, p154-174.

Reschenthaler G.B. and Thompson F. (1996) "The information revolution and the new public management", Journal of Public Administration Research and Theory, Vol. 6, No. 1, p125-143.

Royer E.M. and Toh C.K. (1999), "A review of current routing protocols for ad hoc wireless networks", IEEE Personal Communication, April; p46-55.

Stevens J.M. and McGowan R.P. (1985) "Information Systems for public management", New York: Praeger.

Tapscott D. (1977) "The digital media and the reinvention of Government", Canadian Public Administration, 40, p328-345.

Townsend A.M., DeMarie S.M. and Hendrickson A.R. (1998) "Virtual Teams: Technology and the Workplace of the Future", Academy of Management Executive, Vol. 12, No. 3, p17-29.

Wiener N. (1948) "Cybernetics: The emerging science at the edge of order and chaos", New York: Simon and Schuster.

Wilson F. (1999) "Cultural Control within the virtual organization", The Sociological Review, Vol. 4, p672-694.

Web Resources

http://www.excelgov.org/techcon/media/pr9_28.html.

http://www.ida.gov.sg/, Press release June 6, 2000.

Ibid., IDA, The Singapore eGov Action Plan/

http://www.gov.sg/mcit/S_00_06_06.html.

http://www.dcita.gov.au/ "Government online – A Strategy for the future", media release, April 6, 2002.

http://www.pwcconsulting.com.

http://www.mit.gov.in/, Ministry of IT, India.

http://www.nasscom.org/, NASSCOM – McKinsey Report.

http://www.nr.gov/initiati/it.