# Make M-government an Integral Part of E-government: An Agenda for Action

Dr D.C.Misra, I.A.S. (Retd.)

## Abstract

The paper defines m-government, discusses types of mobility and an m-government framework suggested by Antovski and Gusev (2005). Importance of m-government for economic development is highlighted citing various studies along with the potential, uses and limitations of m-government. The paper then presents two types of M-government and discusses its pros and cons. To tap the vast unrealized potential of m-government the paper draws a 10-point agenda for action. The paper is wound up by concluding remarks noting that efforts in the direction of m-government so far in India have been sporadic and piece-meal. No holistic view of m-government has so far been taken as a result of which the vast potential of m-government continues to be unrealized. It is believed that if this agenda is implemented, it will promote and support the cause of m-government.

## Keywords

E-government, M-government, Types, Economic Development, Potential, Uses, Limitations, Short Message Service (SMS), Agenda for Action, E-business Plan, Mission Mode Project, National eGovernnce Plan, Flagship Programmes, Disaster management Plan, Instant Messaging on Phone, Awareness Campaigns, National Mobile Portal, M-banking, Financial Literacy, "Spoken Web," "Voice Sites"

## 1. Introduction

The Web-based e-government in the current phase has been conceived to consist of three sub-phases: (a) Customer Service (1995-2000) (E-commerce inspired) (b) Virtual Agency (2000-2005) (Portal-inspired), and (c) M-government (2005- ) (Technology-inspired) (Misra 2010). A sub-set of e-government, m-government, is 24/7 "everywhere" e-government mainly, but not entirely, relying upon cellular or mobile telephone whose rapid penetration in India has been astonishing by any standard. There were 380 million cellular subscribers in India as of December 2009 (COAI 2009). Worldwide there were 4.1 billion subscribers as on January 19, 2010 (GSM World 2010). According to International Telecommunication Union (ITU 2009), "Mobile cellular has been the most rapidly adopted technology in history. Today it is the most popular and widespread personal technology on the planet, with an estimated 4.6 billion subscriptions globally by the end of 2009."

India is the second fastest growing market in the world after China (Next Billion 2009). The mobile telephone subscribers constitute an excellent base of people who are literally available to governments worldwide for contact. No wonder, many countries like Malta, Dubai, UK, USA (State of Idaho), Korea, New Zealand, China, etc. have made m-government a strategic objective (Rossel, Finger and Misuraca 2006:82). The message here is clear: e-government is now required to deliver public services on mobile phones, giving birth to m-government.

### Definition of M-government

Defined simply, m-government is public service delivery including transactions on mobile devices like mobile phones, pagers and personal digital assistants (PDAs). Kushchu and Kuscu (2004:3) define it as "the strategy and its implementation involving the utilization of all kinds of wireless and mobile technology, services, applications and devices for improving benefits to the parties involved in e-government including citizens, businesses and all government units." M-government is an integral part, a sub-set, of e-government (Figure 1).
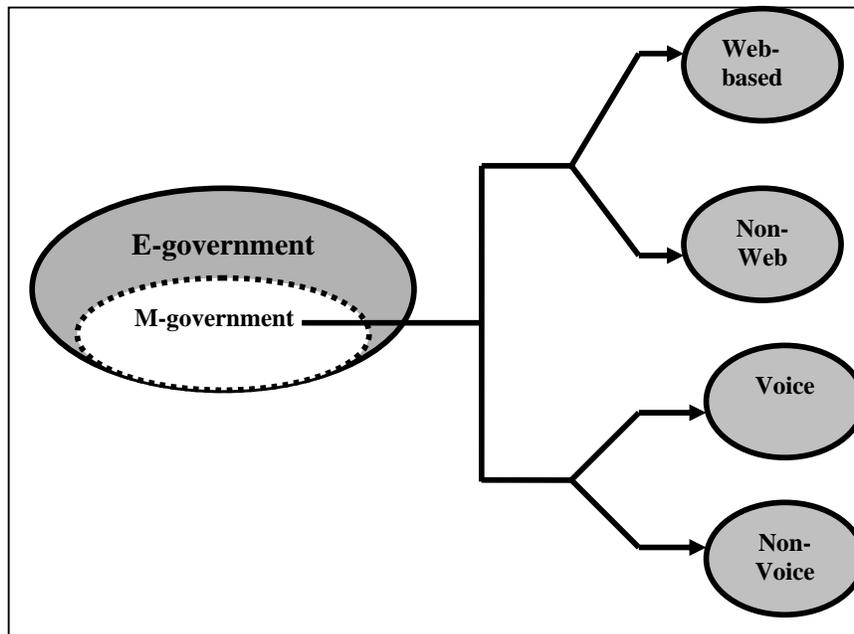
Fig.1 M-government as an Integral Part of E-government
Source: Compiled by the Author

Some call it as an extension of e-government, while others call it an evolution of e-government. M-government is of two types: (a) Web-based, and (b) Non-Web. Again it can be classified as (a) Voice, and (b) Non-Voice.

Apart from the convenience of carriage (small size of mobile phone) and mobility (anywhere e-government), an important feature of m-government is that it can be independent of Web, which is a very attractive feature due to low Internet penetration in developing countries. The momentum to m-government
is provided by the mobile phones and e-government can make use of short message service (SMS). Also, official portals can be accessed through mobile phone browsers.

**Mobility**
At the heart of m-government is mobility. Roggenkamp (2004) mentions six types of mobility: (i) physical, (ii) social, (iii) virtual, (iv) spatial, (v) temporal, and (vi) contextual mobility. Again, he splits mobility into three categories: (i) device mobility, the continued access to services with a device while moving; (ii) user mobility, apart from the mobility without physical constraints, this refers to location- and device independent service access; and (iii) service mobility, the capability to provide a certain service irrespective of device and user (ibid.:5).

**M-government Framework**
Antovski and Gusev (2005) suggest an m-government framework. It is based on five principles of interoperability, security, openness, flexibility and scalability. According to them, "the development of m-government standard unites innovation of architecture, technology, feasibility and citizen's education and awareness (ibid.:37). In their survey in Macedonia, a developing European country, "the major part of the participants were not informed about e-government (66%) and even more 68% did not have a clear picture what is m-government." (n=101, 20-35 years old with strong IT knowledge).

**Importance of M-government**
Sridhar and Sridhar (2004: 20), studying 28 developing countries over a 12-year period 1990 to 2001, show that landlines contribute on average about 1.62 percent to growth of GDP in developing countries, and cell phones contribute positively to national output, on

average, 16.2%. A 1% increase in mobile phones penetration increases growth by 6.75%. Their estimates show that a 1 percent increase in tele-density (total telephones per 100 population) increases national output by 0.15 percent without fixed effects and by 0.10 percent with fixed effects.

Waverman, Leonard, Meloria Meschi and Melvyn Fuss (2005:2), in their study of 92 countries from 1980 to 2003, found that mobile telephony has a positive and significant impact on economic growth, and this impact may be twice as large in developing countries compared to developed countries. Further, a developing country that had an average of 10 more mobile phones per 100 population between 1996 and 2003 would have enjoyed per capita GDP growth that was 0.59 percent higher than an otherwise identical country

Jensen (2007) has reported that between 1997 and 2001, mobile phone service was introduced throughout Kerala, a state in India with a large fishing industry. Using microlevel survey data, he shows "that the adoption of mobile phones by fishermen and wholesalers was associated with a dramatic reduction in price dispersion, the complete elimination of waste, and near-perfect adherence to the Law of One Price. Both consumer and producer welfare increased." Volpini (2009a) notes:

> With M-Government Public Administrations have an ideal means to realize their mission: to serve and involve citizens within the Communication – Access – Participation vision. Creating new services, cutting costs, increasing efficiency, fostering a rapid growth of user base – these are the key contributions of mobile communication to re-launch and empower public services.

### Potential, Uses and Limitations of M-government

According to an estimate approximately 50%–60% of government services in India can be delivered via mobile channel (WB 2007). Caroll (2005:85) 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 (2005:483) goes a step further and suggests that local government should pay attention to the new mobile technologies and theirs 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. (emphasis supplied).

The "lowly" SMS, whose importance was initially not realized by many, has great potential for e-government. It has already found application in banks (for balance, withdrawal, etc.), schools (for declaration of results), railways (reservation status), airlines (flight status), and traffic police (for overcharging by auto rickshaws, complaint about traffic signals not working). Other important areas include bed availability in hospitals, health and educational campaigns and emergency messages/warning to citizens.  In an innovative step, nine deputy commissioners in the national capital territory of Delhi have also introduced SMS service to know the status of a citizen's application for 11 types of certificates[1] by sending a SMS at 9868231002 (Kumar 2006:5).

Three types of benefits from mobile phones have been noted: (i) incremental benefits, (ii) transformational benefits, and (iii) production benefits (id21 2007). Many citizens, however, are not aware of these services, which require publicity. Much also depends upon the governments to avail of SMS as an important channel of e-government in reaching citizens. Due to limitations placed on them, mobile devices can never be substitutes for computers. As such m-government is not a substitute of e-government but it can complement e-government a great deal.

### 2. Web-based M-government

Web-based m-government may be defined as m-government which can be accessed through the World Wide Web. This has given rise to World Wide Web on the mobile devices known as Mobile Web. For browsing the mobile Web, mobile Web browsers are needed as Internet browsers like Internet Explorer, Firefox, etc. are needed for browsing the Internet. A number of mobile Web browsers have already come into existence. These include Opera, Google Android, Internet Explorer for Mobile, etc. Similarly a number of operating systems like Symbian, iPhone, BlackBerry, and Windows Mobile have come into existence.

## Mobile Web

The small screen of the mobile devices pose enormous challenges to engineers to put more and more matter in limited space. Apart from the small screen of the mobile devices, there are issues of interoperability, usability and operation which need to be and are currently being sorted out. A consortium of prominent companies have launched a top level domain (TLD)- ".mobi" – to tell the consumers "This site will work on my phone." (Source: http://mtld.mobi/company). Developed countries have made use of mobile Web for m-government.

## Mobile Web Best Practices Guidelines

The World Wide Web Consortium, popularly known by its abbreviation W3C, Mobile Web Best Practices Guidelines (W3C 2008). The Guidelines, which are in the nature of recommendations, cover a wide variety of subjects. According to the Guidelines, the popularity of mobile devices for delivery of Web content largely stems at present from them being: personal, personalizable, portable, connected and increasingly multi-functional beyond their original purpose of voice communications. (ibid.). In addition to these factors, the advantages of mobile devices will increasingly include: location awareness, one-handed operation, always on and universal alerting device (ibid.). The Consortium makes a bold assertion that:

> Finally, today, many more people have access to mobile devices than access to a desktop computer. This is likely to be very significant in developing countries, where Web-capable mobile devices may play as similar a role in deploying wide-spread Web access as the mobile phone has played for providing "plain old telephone service". (ibid.).

Volpini (2009b) analyses Italian mobile Web portals on two parameters of discoverability and accessibility. The following information is available on mobile Web portals: institutional contents, contacts info, URP (public relations office), services available, institutional news and press releases, agenda, availability of consulting and downloading documents, information about other public bodies, economic information and public utility services (ibid.).

## 3. Non-Web M-government

Short Message Service (SMS) occupies the central place in non-Web m-government. The characteristic feature of non-Web m-government is that it does not require any Internet connection. SMS has found a wide variety of uses in e-government as has been noted in brief in Introduction. Let us have a look at SMS in some detail.

## Short Message Service (SMS)

Short Message Service (SMS), which enables us to send and receive text messages on mobile phones limited to 160 alpha-numeric characters without any images or graphics, has taken the world by storm. It has turned out to be a very powerful tool for communication with human ingenuity on text limitation (for example, how r u? for how are you?). Indeed, a Finnish author, Hannu Luntiala, has written a 332-page novel- The Last Messages- containing 1,000 messages based on the travel of a fictitious former information technology (IT) executive to Europe and India who keeps in touch with his friends and relatives through text messages (AP 2007). The extra-ordinary popularity of SMS in India is

due to its low cost (Rs 1/- for local and Rs 2/- for national SMS earlier, 50 to 100 times costlier than what it cost to service providers; now 1 paisa per SMS since November 2009) and the timeliness of the message. Private sector has found profit in it if large volume could be obtained. For example, India's TV programme, "Kaun Banega Crorepati" reportedly generated 58 million SMSes over three months giving a revenue of Rs 174 million (assuming a charge of Rs 3/- per SMS), which was shared between the TV channel and the cellular operator (Tewari 2007).

The power of the SMS can be gauged from the fact that "The President of the Philippines was deposed in 2001 in an SMS-organized mobilization he called a "coup de text" when just 15% of Filipinos had mobile phones (Res Publica 2007:4). Incidentally, Philippines has been called as the "text messaging capital of the world." More than one million SMS messages were traversing every day as text messages over cellphones in India (Pandya 2002). An estimated 12.3 billion SMS messages were sent by Indian subscribers in 2004, projected to grow to 180 billion in 2010 (Tsuchiyama 2007).

### Growth of Short Message Service (SMS) Messages in India
The growth of SMS messages in India has, however, not been as astonishing as, say in, China. Tsuchiyama notes that the key differentiator is in Indic "vernacular languages" and "a key barrier to SMS growth in India is the lack of handsets embedded with predictive text software in vernacular languages, as well as the lack of awareness, education, and promotion programmes."(ibid). Overall 65% of Indians queried want to type text messages in their own language (and not in English) (ibid).

## 4. An Agenda for Action

It is found that the vast potential of m-government continues to be unrealized. A systematic approach, currently lacking, is required to promote m-government as an integral part of e-government so that its benefits accrue to all concerned. With this view in mind the following ten-point agenda for action is suggested to promote m-government. Note that items can always be added to the agenda but it is useful first to lay firm foundation for m-government and then build upon it.

### (i) Make m-government an integral part of e-government
Despite e-government being more than a decade old in India and despite substantial investments made in e-government, e-government continues to be at the periphery of governance and not in its mainstream. Similarly, awareness about e-government among the common man remains peripheral. Moreover, application of e-government has been piece-meal, ad hoc, and not holistic. Also, m-government is being treated as an independent entity and not as an integral part of e-government. As a result, the potential of e-government is not being realized. It is thus essential to make m-government an integral part of e-government and promote e-government in governance with renewed vigour.

### (ii) Make m-government an integral part of e-business plan for e-government
Currently, e-government is not being introduced in governance in any systematic and planned manner. In order to realize its full potential, it is essential that organization-wide e-business plan for e-government is prepared and m-government is made an integral part of the e-business plan for an _rganization. This will ensure that the possibility of introduction of m-government is examined, particularly as it relates to public service delivery, and m-government is introduced wherever it is feasible to do so.

### (iii) Include m-government as a mission-mode project in National eGovernance Plan
In order that full potential of e-government is realized, it is essential that a mission mode project (MMP) under India's National eGovernance Plan (NeGP) is launched. The project will become a clearing house for various technologies under m-government, a repository of

best practices in m-government at national and international levels, and pay particular attention to application of m-government at the district level where important national-level programs are being implemented. Ideally, m-government should become an integral part of the e-business plan for e-government at the district level and innovations in the application of m-government accorded priority for encouraging 'out-of-the-box' thinking.

### (iv) Include m-government in India's flagship programmes
In recent years the government has introduced a number of ambitious flagship programmes. These include the omnibus four-year (2005-2009) Bharat Nirman (Build India) aimed at strengthening rural infrastructure including water supply, power, housing and roads with an outlay of Rs 1,74,000 crore, Rajiv Gandhi Bharat Nirman Seva Kendras (Rs 28,000 crore), Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP) (Rs Rs 39,100 crore), National Rural Livelihood Mission (NRLM) (Rs 10, 000 crore), and Sarva Siksha Abhiyan (SSA) (Rs 71,100 crore). Not to speak of e-government, in none of these programmes even e-government has been assigned a central position. As a result potential benefits of m-government/e-government are being denied to these flagship programmes. (1 crore=10 million).

### (v) Make use of m-government in disaster management plan at the district level
In disasters lines of communication are usually the first casualty, particularly the landlines. Similarly, lines of communication for mobile phones too need to be protected. Moreover, in emergencies the lines of communications also get clogged due to heavy traffic. Subject to the condition that mobile phones are operational, m-government can be a very useful ally in dealing with emergencies, particularly in organizing rescue and relief operations. Ideally, m-government should form an integral part of the district disaster management plan.

### (vi)  Adopt instant messaging (IM) on phone
A more promising development is proposed launch of instant messaging (IM), like Yahoo! And MSN on the Internet (who have an estimated 300 million IM subscribers worldwide), on phone by telcos in India in July 2007. Much cheaper than SMS and likely to be based on monthly subscription of, say, Rs 100 per month with unlimited messaging with telephone number as the user id (SMS generates 8% to 10% of revenues for Indian telcos) (Luvangal 2007:11). This will provide another communication channel to governments in relating to citizens in real time. E-government has, therefore, also to take this development into account in designing any strategy.

### (vii) Use m-government for launching important awareness campaigns
M-government can be very useful in launching important awareness campaigns, for example, in the field of education, public health, safety, etc. Care should, however, be taken to ensure that m-government is used selectively here and phones are not inundated with all sorts of messages ranging from, say, from "save electricity" to "pay your income tax." Messages too should be short and crisp and should be so drafted as to catch the attention of the man on the move without distracting him.

### (viii) Set up a national mobile portal
Canada has already taken initiative in setting up a mobile portal at http://www.wap.gc.ca/mobile/wireless-eng.html. Services currently offered include border wait times, Canada business service centres contact information, Canadian company capabilities, currency converter, economic indicators, exchange rates, government of Canada employee phone numbers, government of Canada news releases, media advisories, background news, and more, member of parliament contact information, passport offices, national parks, 1 800 O-Canada international toll-free numbers, and weather. India too needs to set up a national mobile portal. If for any reason this is not possible, a sub-portal for m-government in national portal of India (http://india.gov.in/) should be set up.

### (ix) Promote m-banking and provide financial literacy

Verclas (2010) notes that financial services conducted via mobile networks and devices include (i) mobile payment and banking services, (ii) wage and social benefit payments, and (iii) financial literacy and education. While progress has been made in India in m-banking, notably through short message service (SMS), wage and social benefits payments are yet to be made through mobile phones. Similarly, no steps have so far been taken in educating people in financial literacy. Wage and social benefits payments fall within the purview of district administration in India's flagship programmes, most notably in scheme the under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) (Check the website for details at http://nrega.nic.in/netnrega/home.aspx).

### (x) Adopt "spoken web" and set up pilot "voice sites"

It has been estimated that 10% of wages earned (from Mahatma Gandhi Rural Employment Guarantee Scheme (MGREGS) are expended on mobile phones (Sharma 2009). This not only shows the importance even poor attach to communication but it also offers unique opportunity to policy-makers to utilize the medium of mobile phone for addressing the needs of the poor.

IBM India Research Laboratory (IRL) under its Director Dr. Guruduth Banavar in its "Project Spoken Web" (http://www.research.ibm.com/irl/projectspokenweb.html) is developing "Spoken Web" and "Voice Sites" on the lines of "World Wide Web" and "Web sites." Prakash (2009) explains:

> When you want to create a voice site, you dial a specific number at which point software called VoiGen helps you create a new site. You get a unique phone number which is analogous to a URL and when other users access this voice site they get to hear the content uploaded there. Interlinked VoiceSites, similar to hyperlinked Web sites, creates a parallel infrastructure to the World Wide Web.

The research offers path-breaking innovation for bridging the digital divide and, in particular, reaching the illiterate poor currently being served by schemes like Mahatma Gandhi Rural Employment Guarantee Scheme (MGREGS). An eligible person under the scheme can, for example, register on phone dialing a specified number. He can also have account on "voice site" and also receive intimation/confirmation of his payment. A number of other educational, health, and other services can be provided through the "Spoken Web."

### 5. Concluding Remarks

Efforts in the direction of m-government so far in India have been sporadic and piecemeal. No holistic view of m-government has so far been taken as a result of which the vast potential of m-government continues to be unrealized. Moreover, innovative uses of m-government are also denied. Time has come to take a holistic view of m-government and draw an agenda for action so that benefits of m-government are realized by all concerned. An attempt has been made in this paper to draw an agenda for action. It is believed that if this agenda is implemented, it will promote and support the cause of m-government.

### Notes

[1] 1. Registration of Marriage Certificate, 2. Surviving Member Certificate, 3. Orders for Death Certificate, 4. Nationality Certificate, 5. Schedule Caste (SC) Certificate, 6. Domicile of Delhi Certificate, 7. Handicap Certificate, 8. Solvency Certificate, 9. Other Backward Classes (OBC) Certificate, 10.Orders for Birth Certificate, and 11. Income Certificate.

# References

Antovski, Ljupco and Marjan Gusev (2005): M-Government Framework, http://www.mgovernment.org/resurces/euromgov2005/PDF/5_R368AL.pdf (accessed: January 20, 2010).

AP (Associated Press) (2007): Text message novel published in Finland, January 24, http://www.msnbc.msn.com/id/16790277/ (accessed: July 6, 2007).

Carroll, Jennie (2005): Risky Business: Will Citizens Accept M-government in the Long Term? Melbourne, Australia, University of Melbourne, http://www.mgovernment.org/resources/euromgov2005/PDF/9_R376JC.pdf (accessed: January 21, 2010).

GSM World (2010): http://www.gsmworld.com/ (accessed: January 19, 2010).

id21 (2007): As cited in Singh, Rohit (2009): Mobile phones for development and profit: a win-win scenario, Opinion, London, Overseas Development Institute (ODI), April, http://www.odi.org.uk/resources/download/2846.pdf (accessed: January 21, 2010).

ITU (International Telecommunication Union) (2009): The World in 2009: ICT Facts and Figures, http://www.itu.int/ITU-D/ict/material/Telecom09_flyer.pdf (accessed: January 19, 2010).

Jensen, Robert (2007): The Digital Provide: Information (Technology), Market Performance, and Welfare in the South Indian Fisheries Sector, Quarterly Journal of Economics, 122 (3) 879-924, August, http://www.mitpressjournals.org/doi/pdf/10.1162/qjec.122.3.879 (accessed: September 26, 2009)

Kumar, Prakash (2006): Net Worth: Your application status by SMS? Possible, if government e-volves, Hindustan Times, New Delhi, December 8, Friday, HT Metro, p-5.

Kushchu, Ibrahim and M. Halid Kuscu (2004): From E-government to M-government: Facing the Inevitable, May, http://www.mgovernment.org/resources/mgovlab_ikhk.pdf (accessed: January 20, 2010).

Luvangal, B Y S Reejiraj E (2007): New Services - SMS makes way for instant messaging, mint, New Delhi, July 3, Tuesday, p-11, http://epaper.livemint.com/ArticleText.aspx?article=03_07_2007_011_002&mode= (accessed: July 3, 2007)

Misra, D.C. (2010): E-government: The New Frontier in Governance, New Delhi (forthcoming)

Next Billion (2009): India: The Fastest Growing Telecom Market, January 26, http://www.nextbillion.net/news/india-the-fastest-growing-telecom-market (accessed: June 26, 2009)

Pandya, Satish Chandra (2002): Short message service (sms) fervour sweeping India, Press Information Bureau (PIB), Government of India, http://pib.nic.in/feature/feyr2002/fmar2002/f280320021.html (accessed: June 29, 2007)

Prakash, Nivedan (2009): Lead: Creating voice sites using the telephone, Express Computer, October 19, http://www.expresscomputeronline.com/20091019/technology01.shtml (accessed: October 22, 2009)

Res Publica (2007): Prospects for e-Advocacy in the Global South: A Res Publica Report for the Gates Foundation, January, http://groups.dowire.org/groups/research/files/f/13411-2007-03-21T170331Z/Prospects%20for%20e-Advocacy%20in%20the%20Global%20South_Jan_07.pdf (accessed: July 10, 2007), p-4

Roggenkamp, Klas (2004): Development modules to unleash the potential of Mobile Government: Developing mobile government applications from a user perspective, Berlin, Institute of Electronic Business, http://unpan1.un.org/intradoc/groups/public/documents/cgg/unpan035300.pdf (accessed: January 19, 2010)

Rossel, P., Finger M. and Misuraca G. (2006): Mobile e-Government Options: Between Technology-driven and User-Centric, Electronic Journal of eGovernment, 4(2)79-86, December, http://www.ejeg.com/volume-4/vol4-iss2/Rossel_et_al.pdf (accessed: January 19, 2010).

Sharma, Dr Rita (2009): National Rural Employment Guarantee Act 2005: Seminar on "Government Flagship schemes: ICT: A key Enabler" :Using ICT for NREGA, PowerPoint Presentation, New Delhi, Federation of Indian Chambers of Commerce and Industries (FICCI), October 21, http://www.ficci.com/events/20225/ISP/Dr.Rita-Sharma.ppt (accessed: October 23, 2009)

Gang, Song (2005): Transcending e-Government: a Case of Mobile Government in Beijing, The First European Conference on Mobile Government, Brighton, July, http://www.mgovernment.org/resources/euromgov2005/PDF/49_R132SG.pdf (accessed: January 21, 2010).

Sridhar, Kala S. and Sridhar, Varadharajan (2004): Telecommunications Infrastructure and Economic Growth: Evidence from Developing Countries, New Delhi, National Institute of Public Finance and Policy Working Paper No.

14,                                http://website1.wider.unu.edu/conference/conference-2005-3/conference-2005-3-papers/Sridhar%20&%20Sridhar.pdf (accessed: September 26, 2009).

Tewari, Mayank (2007): Message Con: Small war against the big premium SMS rip-off, Hindustan Times, New Delhi,                July                15,                Sunday,                p-8, http://epaper.hindustantimes.com/ArticleText.aspx?article=15_07_2007_008_008&kword=&mode=1   (accessed: July 15, 2007).

Tsuchiyama, Ray (2007): `Go vernacular' is message, The Hindu Business Line, ePaper, May 7, Monday, http://www.blonnet.com/ew/2007/05/07/stories/2007050700120200.htm (accessed: June 29, 2007)

Verclas, Katrin (2010): Scaling Mobile Services for Development: What Will It Take? A MobileActive.org White Paper, January 11, http://mobileactive.org/scaling-mobile-services-development-what-will-it-take   (accessed: January 18, 2010).

Volpini, Andrea (2009a): Mobile government: the forefront of Public Services, http://mobithinking.com/white-papers/mobile-government-forefront-public-services (accessed: January 19, 2010).

Volpini, Andrea (2009b): The Italian case: best practices and missing steps to untap the potential of Mobile Government, http://mobithinking.com/white-papers/m-gov-the-italian-case (accessed: January 20, 2009)

W3C (2008): Mobile Web Best Practices 1.0: Basic Guidelines, W3C Recommendation, July 29, http://www.w3.org/TR/mobile-bp/ (accessed: January 19, 2010).

Waverman, Leonard, Meloria Meschi and Melvyn Fuss (2005): The Impact of Telecoms on Economic Growth in Developing         Countries,         October,         http://web.si.umich.edu/tprc/papers/2005/450/L%20Waverman-%20Telecoms%20Growth%20in%20Dev.%20Countries.pdf (accessed: September 26, 2009).

WB (World Bank) (2007): m-Government: The New Frontier in Public Service Delivery, http://go.worldbank.org/RLCVF90NB0 (accessed: January 21, 2010).