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E-Governance in India: Dream or reality?

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ABSTRACT

India is moving towards achieving e-governance. E-governance can be attained in four steps: Information or Cataloguing, Transaction, Vertical Integration & horizontal integration. India has already achieved the first and the second stage of e-governance. And presently the country is on the verge of attaining the third stage, and moving towards the fourth or the final stage, that is, horizontal integration, which is most challenging. Still there are number of issues untouched. Geographical, social, & economical disparities are the biggest barriers for full-fledged e-governance. Illiteracy, lack of infrastructure, security and privacy of personal and financial data are other constraints. This article discusses the position of India in e-governance environment and issues and challenges ahead.

Keywords: *E-Governance, four stages, India, information to transformation*

1. INTRODUCTION

One day Mr. Indian decides to move from a small village of Nainital, a hill station at the foothill of the Himalayas, to business capital Mumbai in the western region of India. Being away from home for a long time, he felt the need to *connect through Internet chatting or e-mail*, but his family is not net savvy. In fact, the family members are not even comfortable with computer, leave alone the internet. His sister is working at a far remote place; where and how to get internet connection itself is a big issue. Phone lines are available, but speed and connectivity through dial up network is another big issue. Some times even the phone lines are not available or in working condition because of difficult geographical location.

So in order to get connected all the time, Mr. Indian decided to get a mobile connection. He visited the official web site of all the service providers and was able to download the form. While filling the form he realizes he has his PAN card, Passport, Voter's ID card, driving license but the address mentioned in the documents, was of his native place. He do not have a residential proof for local Mumbai address, so he can't get the connection. He tried very hard to get the post-paid cellular connection, but the government officials are reluctant to listen and the private service providers had no choice but to abide by the rules imposed by Telecom Regulatory Authority of India [TRAI]. They want his present local Mumbai residential id proof, which is not readily available since he is in a paying guest accommodation. He was wondering, how difficult it is for an honest and law abiding citizen to get a post paid mobile connection through proper channel. He wished, if the government would have maintained a database for its entire citizenry, perhaps they could have checked his identity from there so that he could have been a mobile user. Simultaneously the security issues could also be dealt with.

He can debit or credit the money through online transactions. He can submit his insurance premium at Nainital, sitting at his office at Mumbai through online payments. He can file his income tax return on line. He can request for a reservation (both train and airline) sitting at home on his computer, pay with a credit card and can print an e-ticket. In case one does not have a printer, railways and airlines service providers deliver it in 24 hours. He wonders if "some day will

we be able to track down our train from our home or on screen at railway station through satellite?" He can even shop few items through Internet.

The answer to all his questions and queries is "E-GOVERNANCE" in India.

E-governance is no more and no less than governance in an electronic environment. It is both governance of that environment and governance within that environment, using electronic tools (Zussman, 2002). This is a very broad definition given by David Zussman, President of Public Policy Forum in his Keynote Address, reflecting the far-reaching implications of information and communication technologies.

Definition of e-Governance

> *E-governance is the application of information & communication technologies to transform the efficiency, effectiveness, transparency and accountability of informational & transactional exchanges with in government, between govt. & govt. agencies of National, State, Municipal & Local levels, citizen & businesses, and to empower citizens through access & use of information*.

2. THE BASIC STRUCTURE OF E-GOVERNANCE

Layne in 2001 described a four-stage growth model to develop a fully functional e-government. Based on technical, organizational and managerial feasibilities, the four stages of a growth model for e-governance are:

- Cataloguing (Information)
- Transaction
- Vertical integration (Interactive)
- Horizontal integration (Strategic, interactive) or transformation

These four stages are arranged in terms of complexity and different levels of integration. This section explains these four stages, mainly based on the original paper of Layne 2001.

The first stage is *"cataloguing" or "Information"* because efforts are focused on cataloguing government information and presenting it on the web. The first stage is focused on establishing an on-line presence for the government.

The second stage "*Transaction"*, where e-government initiatives are focused on connecting the internal government system to on-line interfaces and allows citizens to transact with government systems to on-line interfaces and electronically, is referred as "transaction-based" e-government. This stage is a link between the live database and the on-line transaction.

However, the critical benefits of implementing e-governance are actually derived from the integration of underlying processes across different level of government. Any citizen can contact one point of government to complete any level of governmental transaction, which can be referred as "one stops shopping" concept. This integration may happen in two ways: vertical and horizontal. *Vertical integration* refers to local and central administration connected for any functions or services of government, while *horizontal integration* refers integration across different functions and services.

Vertical or intra- departmental integration is must before implementing the horizontal or inter-departmental integration because of different level of complexities associated. It is expected that vertical integration across different levels of government should happen first, because the gap between the levels of government is much less comparatively than the difference between different functions. Mostly administrators interact more closely with their central or local counterparts than with other departments in the same level of government. The *vertically* and *horizontally* integrated e-government represents an ideal situation, in which citizens have on-line access to ubiquitous government services, with a transparent system.

3. OBJECTIVE

In the fast moving world of automation and digitization, is the fully flagged E-governance for India a dream or a reality? The objective of the paper is to find at which state India lies in terms of e-governance growth model. Being the largest democracy, second in terms of population and diversified geography it self creates the big challenges. The study will try to analyze the issues and challenges for the country.

4. E- GOVERNANCE AND INDIA: WHERE ARE WE?

Table 1 reflects the different e-governance schemes launched by Indian government in different states. All these schemes are presently in different stages of e-governance, but most of these schemes have reached in second stages.

4.1. Stage I: Cataloguing of Information:

The first stage is the creation and the *administration of the website*. Parts of the government's non-transactional information are put on the site. The main reasons of the "electronic cataloguing" stage is to have an on-line presence and access information on government services just like the website from the private sector.

In terms of G2C, this stage offers the least amount of functionality for the user. The typical government department home pages at this stage have description of the department, and some links to other pages. It establishes a departmental "presence". The next step is to re-organize information by services, by different actions or by different events. India has crossed the first stage of "cataloguing". All the government departments and the states have their official web sites with full information.

Technological requirements are the simplest at this stage. Nevertheless, there are some challenges on managing theses sites. The administrator has to balance different amounts of on-line presence and allocated resources required by different departments. Another important issue is maintenance of the information. The web page needs to be continuously upgraded along with the procedural and policy changes. Privacy is another critical issue at this stage, as it is possible to track on-line activities. While this tracking information is collected toward improving the website and its offerings, at the same time this information may also be sold to external parties. Thus several policy issues must be decided by the administration in establishing the site.

Table 1: *State wise list of e-government schemes in India.*

State/Union Territory	*Initiatives covering departmental automation, user charge collection, delivery of policy/programme information and delivery of entitlements*
Andhra Pradesh	e-Seva, CARD, VOICE, MPHS, FAST, e- Cops, AP online – one –stop-shop on the internet, Saukaryam, Online transaction processing, e-immunization Rural Health Call Center and Site Suitability for Water Harvesting, Professional e-Pension
Bihar	Sales Tax Administration Management Information, E-Khajana
Chhattisgarh	Chhattisgarh InfoTech Promotion Society, Treasury Office, e-linking project
Delhi	Automatic Vehicle Tracking System, Computerization of website of RCS office, Electronic clearance system, Management Information System of Education, Delhi Slum Computer Kiosks etc.
Goa	Dharani Project
Gujarat	Mahiti Shakti, Dairy Information System Kiosk (DISK), Request for government documents online, Form Book Online, G R book Online, Census Online, Tender Notice.
Haryana	Nai Disha, Result through Binocular
Himanchal Pradesh	Lok Mitra, HIMRIS ,e-pension, Unreserved Ticketing System by Indian Railways
Jharkhand	Vahan, Tender Notice
Karnataka	Bhoomi, Kaveri, Khazane
Kerala	e-Srinkhla, RDNet, Fast, Reliable, Instant, Efficient Network for the Disbursement of Services (FRIENDS)
Madhya Pradesh	Gyandoot,Gram Sampark, Smart Card in Transportation Department, Computerization MP State Agricultural Marketing Board (Mandi Board), Headstart etc.
Maharashtra	SETU, Koshvani, Warana Wired Villages, Telemedicine Project (Pune), Online Complaint Management System Mumbai
Orissa	E-Shishu, Common service centres (CSCs) in panchayats
Punjab	SUWIDHA(Single User WIndow Disposal Help Line for Applicants), SUBS(SUwidha Backend Services), AGMARKNET(Agriculture Marketing Network), ALIS(Arms License Information System), TISP(Treasuries Information System of Punjab), SSIS(Social Security Information System), WEBPASS(District Passport Application Collection Centre)
Rajasthan	Jan Mitra, RajSWIFT, Lokmitra, RajNIDHI, Aarakshi - Online FIR, Professional E-Delivery of Tax Payers by Income Tax
Tamil Nadu	Rasi Maiyama-Kanchipuram, Application Forms Related to Public Utility, Tender Notice & Display
Uttar Pradesh	Lokvani,e Suvidha,Bhulekh,(Land Records), Koshvaani, Treasury Computerization, PRERNA: PRoperty Evaluation and Registration Application, Bouquets of services offered by Transport Department
Uttarakhand	Kisan Soochna Kutirs (KSKs) , Village Information Centres (VICs), Computerization of Land Record Department, Automation of Transport Department:
West Bengal	Vehicle registration, land records, birth and death registrations, employment exchanges, payment of excise duty, sales tax and local tax, electronic bill payment of water and electricity, computerization of health records,
North Eastern State	
Assam	ASHA
Arunachal Pradesh, Manipur , Meghalaya, Mizoram & Nagaland	Community Information Centre. Forms available on the Meghalaya website under schemes related to social welfare, food civil supplies and consumer affairs, housing transport etc.

Organizational challenges are limited at this stage since its scope is also limited. The first challenge is assigning responsibility for the overall coordination and planning of services on the administration web site as well as its maintenance. The second issue is assigning responsibility for the answering of e-mails. Web sites often include an email address for questions from site users. In most of the cases the government web sites are unable to give on time replies to queries but web sites managed by private sectors handle the customer queries very quickly and effectively. Some procedure must be established by the department to address to handle these emails and that to very quickly.

4.2. Stage II: Transaction

Stage II is a two-way communication, where citizens move from a passive to active role. Citizens transact with government, on-line by filling out forms and government responds by providing confirmations, receipts, etc. In stage two, citizens can perform on-line transaction, for example, renew their licenses and pay fines or taxes, Birth or death registration. In this stage transaction is done through on-line interfaces directly connected to the internally functioning government systems with minimal interaction with government staff. Electronic transactions offer a better hope for improved efficiency for both the customer and the government agency than simply "cataloguing information". This stage presents Government on the internet as an active respondent. In India now it has been possible to get the reservation (rail or airlines) on line, transact the money or fill the forms for most of the departments. The entire government department be it election commission or bank, income tax or insurance, colleges or railway, has helped the Indian government to attain second stage.

4.3 Stage III: Vertical integration (Intra-departmental assimilation)

> *"Petrol pumps to go Hi-Tech in country" (Mumbai Mirror, 3 September, 06)*
>
> *"Use the mouse to visit under trials: Arthur road jail will install online system to enable relatives to get appointments" (Sunday times of India, Mumbai, September 23, 2006)*
>
> *"State police get net savvy, interrogate accused on webcam" (Times of India, 23 Sept, 2006)*
>
> *"E-filing cases in apex court of India from 2 Oct 2006"*

All these headlines of the newspaper indicate the state of the country in the e-governance era. E-governance is not about automating and digitizing existing processes but transformation of government services; it requires a re-conceptualization of the government service itself. The full benefit of e-governance can be experienced only when Organizational changes accompany technological changes.

After successfully completing the second stage, India is now on the verge of attaining the third stage for most of the departments like financial institutions, railways, income tax department etc. After on-line transaction services become prevalent and mature, citizens' expectations increase. Most transaction stage systems are localized and fragmented. A natural progression is the integration of scattered systems at different levels (intra-departmental) and different functions (inter departmental) of government services. Fragmented local and central systems are expected to connect and communicate with each other for smooth functioning. Vertical integration goes beyond this simple interconnection. The objective of vertical integration is to seamlessly integrate the central and local systems for cross-referencing and checking. With each transaction with an administration, the transaction information moves upward or downward to the appropriate counterparts.

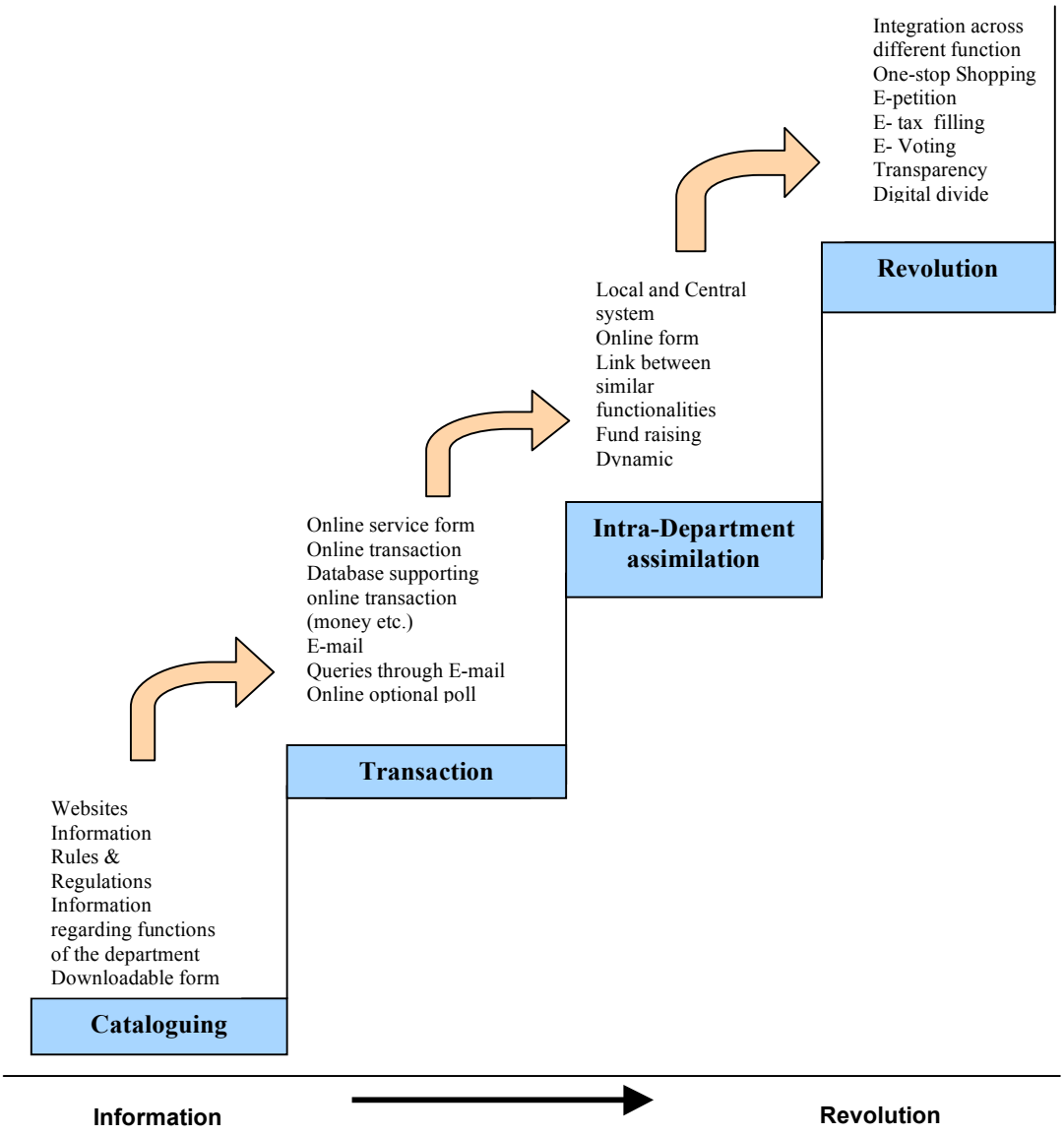

Figure 1: *Stages of e-governance*

The various levels of systems are inter-connected so that results of transactions from one system can be interchanged with another system. Physically, this may be integrated as a central database or a connected web of databases communicating with each other. At this stage G2G transactions are more important than G2C ones.

Communication and integration-oriented technologies become more important for the initial third stage. In order to integrate central and local administrations, a web of remote connections is a technical prerequisite. In this remote connection and virtual transactions, several technological issues are emerging: authentication, format compatibility of electronic data interchange, exposure level of internal legacy system to outside, etc. With the automation of the systems and the process, the role of government employees also changes, extends beyond the functional local departmental boundaries.

Even though stage three has improved efficiency, in whatever department be, privacy and confidentiality issues must be carefully considered. Simultaneously government officers have to be less proprietary about their information. A conceptually centralized database is still viewed with alarm as opposed to increasing efficiencies. An appropriate balance is must between the privacy of personal information and the right of individuals to access public records. In India all the banks and finance department are far ahead in this stage. But the public administration, health care, electricity, water supply etc needs a cautious watch. E-voting is still a dream since confidentiality and authentication issue is still a distant dream in India and political will is very weak.

Stage IV: Horizontal Integration (Revolution):

State Bank of India and Bharti Airtel has partnered to enable money remittance over mobile phones in 2007. The intent is to enable individuals' access to the benefits of a full range of financial services regardless of socio economic level or geographical location using the ubiquity and ease of mobile communications. The project is piloted in a small Himalayan village of District Pithoragarh in state of Uttarakhand have seen the tremendous results in that unbanked village. The project has the potential of transforming the lives and economies across the globe.

The benefits of e-governance from the citizen's as well as government's perspective can only be achieved by inter-departmental integration of government services across different functional units. The limitations of the functional nature of both the public and private sector will become clearer as more public administrators begin to see the vision opened by the ICT. "One Stop Shopping" concept helps the citizens to get assistance in more then one service area.

The horizontal integration within different departments and functions increases the efficiency of the government exponentially. Through communication and sharing the information through all the level and function, the shared information will propagate immediately and thus will help the citizen to access the services and do the work across the wide variety. As an example, when a citizen moves from one city to another, the basic residence record could be propagated to different functional service branches of government such as the medical assistance and the local election department so that the citizen does not have to run from one department to another or administration. Sharing of such database and information is a major stumbling block for India being a fully functional e-government.

The concept of governance and, management of government staff is subject to re-evaluation from the perspective of e-governance. The need is to change the mindset of the government officers, especially to those who think their department is superior to others, so they need not to share the information. This is another fumbling block for inter-departmental integration and e-governance. Instead of department centric approach, a new citizen centric approach has to be adopted.

5. E-GOVERNANCE FOR DEVELOPMENT OF INDIA

The concept of e-governance is now moving towards reality for Indian citizens. The country is graduating from pilot e-governance projects to bigger Mission Mode projects. Table 1represents all the current e-governance projects in the country. The core strategy for India is to move ahead in a systematic manner, and the approach is to achieve success step by step. The financial sector is revolutionized through ICT, but the democracy and e-voting concept is still a dream.

The National e-Governance Plan (2003-2007) [1] of Indian Government seeks to lay the foundation and provide the impetus for long-term growth of e-Governance within the country. The plan seeks to create the right governance and institutional mechanisms, set up the core infrastructure and policies and implements a number of Mission Mode projects at the center, state and integrated service levels to create a citizen-centric and business-centric environment for governance. In 2005, the World Bank signaled its willingness to increase funding further (if required) for a range of e-governance initiatives in India as part of the first phase of the country's National e-Governance Plan (NeGP) [2]. Mission 2007: every village to be a knowledge centre aims to provide knowledge connectivity to every village of India by August 15, 2007, according to the policy of Indian government. The government has set this target according to national e-governance plan (2003-2007) and a National Alliance for Mission 2007 was formed in 2003. An apex committee under the Cabinet Secretary is already in place for providing the strategic direction and management oversight. Knowledge village seems to a distant dream.

Case of Gujarat interstate border check posts: e-Governance causes reduction in corruption and increase in tax revenues. In Gujarat, a team of techno-savvy bureaucrats have finally succeeded in bringing corruption under check and consequently increasing state's tax revenues through the effective usage of computers and other electronic devices at some 10 remote interstate border check posts. [3]

6. CRITICAL ISSUES FOR INDIA

E-governance is a big challenge and a far big opportunity to bring services to all citizens. The most significant characteristic of any successful e-government application is its *quality* (Signore, et al 2005) and accessibility. The issue (Cost, Time) of integration of legacy systems comes onto the scene. As the information collected by governments may be politically sensitive, installation of appropriate security mechanisms may be an important technical consideration. At the same time, many other policy issues need to be resolved, such as authentication and confidentiality.

6.1 Technical issues

IT infrastructure is the backbone of E-governance. Interoperability with existing software and hardware platforms is a key success factor. It is unlikely that available resources can support a full replacement of existing application. Hardware should be fully compatible with future technologies as well.

Finally, some legal aspect, like security and privacy, must be considered, as personal data are processed and stored, and financial transitions must be executed. To cope with such requirements appropriate technical changes must be done. Multi-model application can make it more successful.

6.2 Privacy

Citizens' concern on privacy of their life and confidentiality of the personal data need to be technically supported**.** Privacy and confidentiality has to be highly valued in establishing and maintaining websites. An ideal Cyber policy and strict appliance of it is the backbone for citizen's support.

6.3 Securities

The financial transaction demands for transactional security. Few recent cases have raised the issue once again. All support for full security is necessarily needed to maintain. An ideal Cyber Security Policy will ensure the existence of a sound and secure e-governance and critical infrastructure base in India. The security and safety of various ICT platforms and critical infrastructures in India must be considered on a priority basis before any e-governance base is made fully functional.

6.4 Social issues

Acceptance and usability by a large variety of people make e-governance successful. Since the social disparity is very high in India, so this issue needs a careful observation. This implies that interface must be usable by rich or poor, disabled or elderly people, understandable by low literacy or non-native language people, etc.

6.5 Infrastructure

Social, geographical and economical disparity issues have to be removed and proper infrastructure is required to establish e-governance. The ICT facilities need to be developed and should be available to one and all citizenry. Internet connection through satellite, phone lines or through cable or Television should be accessible for all specially to the people in rural areas.

Table 2: *Comparison of ICT usage between India and developed countries*

Country	PCs/100	Telelines/100	% of population on line
India	0.45	3.20	1.2
USA	58.52	69.97	62.1
Canada	39.02	67.65	46.5
UK	33.78	67.65	55.3
Australia	46.46	52.41	52.5
New Zealand	36.02	49.57	46.1
Singapore	48.31	48.57	49.3

Source: Mahapatra R. and Perumal S. 2006

6.6 Accessibility

Any service should be accessible by anybody from anywhere at anytime. Even if Internet population is exponentially growing in India, still there is a significant portion of the people who may not be able to access services for various reasons like limited access to ICT technologies and devices, low literacy, or phobia for Computer etc. Therefore, universal access is still a mirage.

Table 3: *Concern for E-Governance in India*

	RURAL	URBAN
ISSUES	Lack of infrastructure	Concern for security
	Less literacy	Concern for privacy
	Less Computer literacy	Lack of time
	Lack of Awareness of the function	
	Fear from Bureaucracy	
	Social and economic disparity	
SOLUTIONS	Education	Technical supported security & privacy through Bio-metrics etc
	Computer & Internet Education	Well placed IT & security rules
	Transaction through other media like phone or mobile or cable TV	Inter-operability
	Proper Training	One stop shopping
	Cheap & Simple procedure	Transparent system
	Availability of ICT facilities	
	Easy to operate	
	Accessibility to all	

6.7 Usability

People especially in rural areas are often non-expert users and need guidance and support for their transaction. Governmental websites must be user friendly, to be effective. In India English speaking percentage is very low, so the web sites should also have the facility to access in native or local language.

6.8 Acceptance

A reconceptulization of government services is mandatory for successful implementation and to get social acceptance. This will happen only if government processes will be organized for citizens' convenience instead of the convenience of the government. A relevant issue will be to have all the citizens well aware and acquainted of the facilities offered by the e-government infrastructure, and have them to trust in it. The demand is appropriate marketing actions and education for less skilled people.

6.9 Political will power

E-governance means less interaction with government servants, it will be helpful in reducing bribery issues. The strong objections of the government officers also need a careful and wise approach. This task may require an honest and strong will power of the politicians and leaders. E-voting concept is not acceptable to politicians.

6.10 Economical issues

Economical issues are mainly concerned with return of investment and safeguard of the previous ones. Cost of implementation, operational and evolutionary maintenance must be low enough to guarantee a good cost/benefit ratio.

6.11 Maintainability

Maintenance of ICT is a key success factor for long living systems in rapidly changing technical regularity environment. A well skilled labour force and strong will is need of the hour for timely and regular maintenance.

6.12 Reusability

Full fledged e-governance is for the whole nation. Some modules at least should be re-usable.

6.13 Portability

Independence from hardware/software platforms is primary requisite for portable application, to help in possible reuse by other administrations.

6.14 Legal Issues

Strong and effective rules related with IT has to be formulated and strongly implemented. This presupposes the adoption and use of security measures more particularly empowering and training judiciary and law enforcement manpower with the knowledge and use of cyber forensics and digital evidencing.

6.15 Literacy

In India where literacy rate is low, e-governance is a real challenge. Lack of IT Literacy and awareness regarding benefits of e-governance has to emphasize.

6.16 Other issues

- Underutilization of existing ICT infrastructure.
- Attitude of Government Departments and government officers need a proper counseling. Many officers perceive their department as most important and disregard other department's needs.
- Lack of coordination between Govt. Department and Solution developers.
- Resistance to re-engineering of departmental processes is also a challenge, but this approach is changing now.

7. NEED OF THE HOUR

7.1 Database of citizens

A proper and well placed database of all the citizens is one of the major requirements for a successful e-governance, which will prove to be most challenging for India. It should contain all the personal i.e. name, address, citizen Id, etc. and financial information. Every citizen should have a unique Id number and password. The citizens can access their information and transactions through this but at the same time the other people won't be able to access their record. Just by going through his/her file the individual will come to know about their electricity bill, bank statements, next due LIC premium, phone bill etc. and can transact with all or any of the department at the same time. This one database will be common and accessible for all the departments. The strongly secured and systematic database will also be helpful in identifying the intruders and thus will be able to tackle the security issue for the country too.

7.2 Biometrics:

The strong database needed for a successful e-governance is vulnerable to fraud. There are attempts being made to come up with "Biometric" techniques, which are more secure. The password can be replaced as an individual's mark of identity. Similarly, password can be replaced by fingerprints or facial characteristics to verify the identity. Instead of having card readers, there should be devices like fingerprint readers or eye scanners. Common Biometrics implemented or studied includes fingerprint, face, iris, voice, and signature and hand geometry. It is one of the important evolving technologies, which will ensure the security and privacy issues as well. The market is full of such type of computers and laptops. But underutilization of these techniques is one of the barriers.

7.3 Smart Cards

One smart card with complete detail of the citizens is the smartest solution. A smart card with citizens name, address, financial information, personal information etc. fully supported and secured by Biometrics may be the key solution. A fully secured card with easy operability can be used for all transactions, and information. One such project was pilot run at IIT Bombay campus few years back. But a lot of issues need to answered, before actually going for it.

8. CONCLUSION

E-governance is an evolutionary phenomenon, and requires a change in the mindset of one and all – citizen, executives or the government. With the support of the Internet, the government processes defined by specializations can be made efficient, effective, and citizen friendly. There are many challenging issues lying ahead. Security is the main concern for the citizen, and redefining rules and procedures, information transparency, legal issues, infrastructure, skill and awareness, access to right information, inter-departmental collaboration, tendency to resist the change in work culture, are the main concerns for the government to address.

Other then all these factors, the government needs to make significant investments in areas such as government process re-engineering, capacity building, training, assessment and awareness. The beneficial impact of ICT and of e-governance on the rural economy and quality of life is now widely recognized. An apex committee under the Cabinet Secretary is already in place for providing the strategic direction and management oversight. The need is to maintain a proper database of all the citizens and well developed infrastructure. Security issues need to be tackled very carefully supported by technical security. Most important is the strong political will power and the social acceptability of e-governance not only in urban areas but rural areas as well.

Endnotes

[1] http://www.egov.mit.gov.in

[2] www.e-governance-imp.html

[3] http://www.it.iitb.ac.in/~prathabk/egovernance/egov_success_stories_gujrat.html

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