

E-GOVERNANCE: INTEROPERABILITY ISSUES

Subhash Chander*

Sharmila**

ABSTRACT

Electronic Governance (E-Governance) is current issue and is core subject for new administrators in the field. The traditional Governance processes have given rise to many problems like corruption, red tapism, unbalanced growth of rich and poor, rural and urban and other categories of people, mental harassment in the name of the processes to the users and many more. E-Governance can help up to some extent in removing some of the problems. But implementing e-governance in a country like India is a challenging task and various hurdles are there in the implementation of e-governance services. Some of the challenges are Information and Communication Technology (ICT) infrastructure, large population, literacy rate and Lack of interoperability at various levels. Various examples showing lack of interoperability are available in the current e-governance systems. Lack of interoperability gives rise to problems like duplicity of systems Proper interoperability would ensure wastage of efforts, time and money on the same kinds of projects and it would help in replication of good projects implemented already by many states as well as departments. In this paper Interoperability and various challenges and solutions of the challenges have been proposed for implementation of National E-Governance Plan (NeGP) in India.

Keywords: e-governance, Framework, G2C, ICT, Interoperability, standardization.

*Govt. P.G. College, Karnal, India.

**Doon Valley Institute of education, Karnal, Haryana.

INTRODUCTION

Interoperability is an important issue in governance. NeGp and other e-governance projects are being implemented by Government for the citizens with the help of Industries and other private sector & Government Organizations. Before implementation of all these there is need to take full participation of citizens which are ultimate users of various e-governance services. For effective implementation of e-governance projects infrastructure like State Data Centre (SDC) for data storage, Common Service Centre (CSC) for effective service delivery to citizens and State Wide Area Network (SWAN) (for better network infrastructure and State Service Delivery Gateway (SSDG) for sharing data to deliver electronic services to citizens and all this is to be provided through state portals. Portals must have interoperability in various components and modules. Compatibility and interoperability are used interchangeably many times but these two terms are different. Compatibility is a technological property of system components enabling two components to work, act or go together. If two devices are compatible then communication between these two devices is possible. Communication between system elements is characterized by the output of one system becoming the input of another while this sending and receiving of content requires a connection between compatible system elements that is provided for by interfaces (Pankowska M. (2008)). Interoperability is the ability of two or more systems to interact with one another and exchange data according to a specific prescribed method to achieve predictable results. Systems to interact with may be computers and other information communication technology devices. There are so many definitions but all these definitions suggest one thing in common that is interoperability is the ability of two or more systems to exchange information and use this exchanged information (Vasavi S., Kishore S. (2011)). It deals with application and semantic concepts which make possible the information flow between organizations (Shrivastava S., Pandey A.N. and Kumar P.(2010)). ICT application in governance has given rise to the two terms namely e-government and e-governance. E-government and E-governance are used interchangeably but there is difference between the two. E-government is the modernization of the processes and functions of the Government using the tools of ICT to transform the way it serves its constituents. Citizens are seen here as passive recipients of digital information and services (Satyanarayana J. (2006)). On the other hand e-governance is seen as decisional process. It is the use of ICT in the systems of governance so as to ensure wider participation and deeper involvement of citizens, institutions and NGOs and companies in the decision making process of governance as

compared to traditional forms and forums of consultation in democracies today. Hence e-government is the subset of e-governance and its focus is on improving administrative efficiency and reducing administrative corruption. The clear difference between the two terms has been given here as under. In case of e-government ICT is being applied for improving Government processes whereas in case of e-governance ICT is being applied for more and amore participation of civil society in the process of governance. In case of e-governance ICT can be utilized for debates on certain political, cultural, religious and social issues (Malhotra C., Chariar V. M., Das L.K., and Ilavarasan P. V.(2007)). E-Governance is broader term than e-Government or e-Democracy. E-governance focuses more on interaction among citizens, community actors and stakeholders and their locally elected politicians (Pankowska M. (2008)). E-governance is defined as the manner in which power is exercised in the management of a country's economic and social resources for development (Bhatnagar S. (2008)). Implicit in the reference to 'power' is the concept of accountability. Hence e-governance is the use of ICT by government civil society and political institutions to engage citizens through dialogue and feedback to promote their greater participation in the process of governance by these institutions. Conclusively e-government is defined as mere delivery of government services and information to the public using electronic means whereas e-governance allows direct participation of constituents in government activities. It will provide new concept of citizenship in terms of rights and responsibilities. RTI act, 2005 is also providing fruitful results to determine rights and responsibilities of citizen in India. The organization of the rest of the paper is here as follows.

INTEROPERABILITY AND E-GOVERNANCE

In a democratic nation like India e-Governance should enable seamless access to information & flow of information across the state and central government. No country has so far implemented an e-governance system for so much large population. One of the major requirements for implementing successful e-governance is interoperability standards for the exchange of secure information with non-repudiation, across the state and central government departments seamlessly (Kanungo V.,n.d.). Various projects have been developed at centre, state and district levels in India. All these projects are to be used by people may be with the help of e-governance portal. To utilize these on e-governance portal, these projects will have to be integrated. There is requirement of complete interoperability between various departments of India at vertical and horizontal levels (Tripathi, R., Gupta M.P. & Bhattacharya, J. (2007)). Those applications that are emerging as islands of successes have to

be interoperable. Hence there is a great need to have well defined interoperability policy. The e-governance architecture needs to ensure meeting the future requirements. It has also to ensure that the local architecture fits into the State level and the same into National and Global architecture. Interoperability is a major criterion while defining the architecture (Kanungo V.,n.d.). Major goals of interoperability include data exchange, meaning exchange and process agreement (Oracle, 2007). Data exchange means whether data can be exchanged. Exchange of meaning means all participants will interpret the meaning of data in the same way. Whereas in process agreement all participants must agree in earlier about what to do with the data they will receive in the exchange. This means that data to be exchanged is in a pre -specified format known to the parties involved. This issue seems to be small at this time but as soon as level of e-government increases there will be strong need to have interoperability between various departments at national and even at international levels. IEEE (Interoperability, n.d.) defines interoperability as the ability of two or more systems or components to exchange information and to use the information that has been exchanged (Tripathi, R., Gupta M.P. & Bhattacharya, J. (2007)). Interoperability frame deals with providing basic standards that all the agencies should adopt. Customers want interoperability between different implementations of standards in the marketplace (Mudd M. (2009)). Various e-governance standards (egovstandards.n.d.) are necessary for gaining interoperability.

INTEROPERABILITY TYPES

Interoperability frameworks explain policies, guidelines and best practices. Major aim of interoperability framework is to make easy the integrated provision of services to both citizens and businesses by means of the ICT (Tripathi, R., Gupta M.P. & Bhattacharya, J. (2007)). Types of interoperability include syntactic, semantic, technical and organizational interoperability. Syntactic interoperability makes capable of communicating and exchanging data between two or more systems. Syntactical interoperability is a necessary condition for further interoperability. Semantic interoperability is the ability to automatically interpret the information exchanged meaningfully and accurately to produce useful results as defined by the end users of both systems (Interoperability, n.d.). Semantic interoperability is requirement for the front-end multilingual delivery of services to the user. Here efforts are made about making information accessible from one system to another system. Technical interoperability, which covers aspects related with technical issues of computers. It includes issues related with platforms and frameworks. Frameworks are complex and duplicative and contradictory

with multiple levels (Tripathi, R., Gupta M.P. & Bhattacharya, J. (2007)). Technical issues include open interfaces, interconnection services, data integration and middleware, data presentation and exchange, accessibility and security services (Tripathi, R., Gupta M.P. & Bhattacharya, J. (2007)). Organizational interoperability, concerned with defining business goals, modeling business processes and bringing about the collaboration of administrations that wish to exchange information and may have different internal structures and processes. The processes are not flexible and adaptive to be integrated and interoperable. Hence there is need of decentralized organizations to meet major needs for coordination. The top level management plays a vital role in organizational interoperability.

E-GOVERNANCE INTEROPERABILITY IN INDIA

E-governance is provided high priority in India, because it is considered the only means of taking IT to the general public and makes the business of governance inexpensive, qualitatively responsive, and truly encompassing. From Indian perspective e-governance needs to be more citizen centric being populous and democratic country. Providing citizen centric services require information must be shared among various departments and various levels of government. Such services can be provided by increasing public trust and awareness among its users and explaining benefits of e-Governance services provided by governments to people. Interoperability does not only means sharing of information between networks (Deller R., Guilloux V. (2008)) it also include reengineering of current traditional administrative processes for effective and transparent delivery of government services to its citizens of a country. Interoperability is necessary because due to lack of interoperability and standards in e-governance services one is not able to utilize the service from various levels like centre, state, district, block and tehsil level in future in India. Scope of interoperability is very large and it must be interoperable not only within states bur also within countries having similar kinds of administrative problems. Hence there is need of interoperability not only within and across organizational and administrative boundaries but also across national boundaries. Indian Government is very serious about this issue of interoperability in e-governance. Government of India (GOI) has setup an institutional mechanism for formulation of standards through collaborative efforts of stakeholders like Department of Information Technology (DIT), National Informatics Centre (NIC), Standardization Testing and Quality Certification (STQC), other government departments, academia, technology experts, domain experts, industry, BIS, NGOs etc. (Ray, D., Gulla, U. & Dash, S.S. (2011)). STQC being a part of DIT is responsible for release of approved standards, versions, control and public

reviews (egovstandards.n.d.) .Draft policy on open standards is an important step taken by GOI. Such steps will help in applying interoperability at technical level. interoperability initiatives taken by GOI requires a deep insight into the areas of network and information security, digital signature, quality and documentation which are the base of expanding e-governance services in a country like India. Another step by GOI for standardization includes an enterprise architecture framework (EAF) for e-Governance implementation. The framework is also expected to provide a systematic way for government ministries/departments to describe their business using a common language and to identify gaps in service delivery models (Pyarelal, S.(2007)).

ADVANTAGES OF INTEROPERABILITY

Advantages of having interoperability in e-governance include

- (1) Provides better coordination among Govt. agencies, Programmes and services.
- (2) Provides foundation of a citizen-centric, one-stop delivery of services through a variety of channels.
- (3) Helps in cost savings and/or cost avoidance.
- (4) Interoperability breaks dependence on single vendors and provides choice for governments in their purchases.
- (5) Promotes international cooperation and helps in creating infrastructure necessary to solve certain cross border issues like money laundering, environmental pollution, illegal arms trade etc.
- (6) It paves the way for good governance.
- (7) Will increase transparency and accountability in the process of governance (Oracle, 2007).

INTEROPERABILITY AND OPEN STANDARDS

There is also lack of standards in providing various services to the citizens and that lack of standardization is utilized by the anti social elements of the society to prepare bogus documents of various departments. A lot of people are looted by such elements and one can have instances of such events in daily news papers and news. Also there are various online frauds example in the news and in all such cases lack of standards and interoperability has always been major cause of such incidents. Interoperability requires open standards. Standardization efforts have helped in simplification of business processes and can also help in governance processes. Basic processes and standards should be framed at global level. The standards on e-forms, developing portals, etc are prepared and shared across the states to

tackle the issues like scalability, replication and interoperability (Gupta P., Bagga R K and Sridevi A. (2009)). National Policy on open standards has chosen open source technologies and other reliable open source tools to conform open standards as a measure for e-governance application (Gupta P., Bagga R K and Sridevi A. (2009)). Standardization is a necessary condition to develop and ensure interoperability of e-Government institutions on different hierarchical levels and cross-countries (Pankowska M. (2008)). Major goal of Interoperability and open standards is to provide effective and efficient exchange between computer systems. But mechanism for accomplishing that goal is very different. Interoperability must be distinguished from open standards (Interoperability, n.d.). Open standards are defined and developed in a transparent way by independent people from multiple organizations of an independent group. Bearing all these factors in mind, some state governments decided to go with Red Hat Linux as it is an Open Source platform and doesn't involve proprietary fees (Jena, C. (2007)). The combination of Red Hat Linux and open source software has been cost-effective and user-friendly. The security of Linux is also far superior to other operating systems that are prone to continuous attacks from viruses. Through open system standards for E-Governance, can help in removing such barriers (security, privacy and lack of trust) for providing effective government services at national and international levels. Open source software can help a lot in removing some of the barriers of interoperability (Deller R., Guilloux V. (2008)). It is expected that adoption of open standard would ensure seamless interoperability of various solutions developed by multiple agencies (Ray, D., Gulla, U. & Dash, S.S. (2011)). In India 'National Policy on Open Standards for e-Governance' has been framed by GOI for implementation of e-government solutions. Indian government has set up portal (egovstandards.n.d.) for maintaining standards in E-Governance. It provides a platform for sharing of ideas, knowledge, and draft documents among the people involved in the standards formulation process.

CHALLENGES & NEED OF INTEROPERABILITY AND E-GOVERNANCE

E-Governance has become a global phenomenon. Many innovations have taken place in e-Governance sector over the last decade. Many state governments are offering online services to its citizens. In Indian context various southern states are ahead of all other states in India in providing such services online. Many governments have developed detailed strategies for implementing their e-governance programs. Governments have the tendency to learn from each other. E-Government interoperability is perhaps the major issue of e-Government today

in both developing and developed countries. In order to create advanced solutions with integrated e-services and one stop government there will be high demands on e-government interoperability E-Government is now deployed by many governments around the world in order to harness the potential of Information and Communication Technologies (ICT). At global level various E-Governance schemes and projects have failed miserably and more than 50% of the projects have failed partially or fully in the past. One of the strong reasons of such failures may be due to complex nature of E-government (Kifle, H.and Low Kim Cheng, P.(2009)). There are certain challenges to interoperability. There are significant challenges to affect truly usable service delivery, caused by lack of literacy, limited resources, and lack of knowledge on how to deliver services in culturally and socially appropriate ways (Etienne B., Laurens C., and Hina P. (2003)). Displays and keys should be based on localized interfaces and multi-media instructions should be commonly used to make the interface accessible in rural areas, where low literacy rates can be an obstacle (Report (2008)). Security and privacy are the major barriers for interoperability. Another challenge of interoperability is lack of trust in interoperable systems between two departments or governments. This lack of trust may be because of various security reasons including data protection and privacy. If the system is having more monetary or financial value then there are more chances of propagation of this lack of trust among the two parties. Interoperability is a barrier in achieving the full benefits of e-government. Different countries have different environments in connection with electronic infrastructure, population utilizing that infrastructure and other social and cultural differences. E-Governance services are affected a lot depending on the status of these factors. In Indian perspective there is need to stress on semantics interoperability in various departments since vocabulary utilized by various departments for the same purpose is different. In case of police department and revenue departments there are various terms whose meaning is only known to the limited persons and such words are being used in the same format and context since long times. There is need to have common vocabulary or words so that they may be well understood by the users and developers of the systems.

PROPOSED SOLUTIONS

Security and Privacy: Security & privacy policy of the organization must be clear and must not be vague. Governments departments must place its security and privacy policy on its website so that people using that policy may gain confidence of utilizing the services provided by the particular government organization. Security and privacy policies framed by

Governments regarding related departments would help in solving the problem of interoperability between these departments.

Trust & standardization : when two organizations whether Government or Private want to interchange data then there is need to have trust among both the parties involved in the process. Trust of on organization is made up of its employees own trust and stability. Standardization is also a major component when it comes to interaction between various entities.

Complex nature of E-government: This is one of the major barriers of Interoperability. There may be different ways to do job with the help traditional process and through electronic process with use of computers. But personnel doing jobs in the traditional way knows the intricacies in the whole process of performing a particular function and hence he must be involved while converting the traditional ways to online or electronic. Knowledge acquired by these people may be utilized so that one may not face problem in future that might have faced in the past by the particular employee. Very complex nature of public administration and its processes pose great difficulties in realizing e-government solutions to various processes. There is need to think over that how the current process can be made simple with the use of ICT so that it may be utilized by more and more people and be cost effective.

Semantic interoperability for heterogeneity problem

Semantic interoperability is the capability of different information systems to communicate information consistent with the intended meaning of the encoded information. Here semantic interoperability between two systems must be checked manually or tried through other ways so that there may not be any problem in future. Heterogeneities exist at various levels it may be at data level, hardware level and software level.

Lack of localization of content in local languages

In e-governance various departments and people are to take initiative to make it a success one. The content should be provided to villager in his native language and facility of transliteration must be there.

Complex bureaucracies & firmly established culture in governance

Major problem for Indian bureaucracy is frequent transfers and that affects the each and every project and its various components. E-governance requires interoperability but traditional governance does not allow it. Hence there is need to change the established rules and adopt certain new changes desired for proper implementation of e-governance.

CONCLUSION

Countries like India must learn from developed countries and make metadata and other data standards for employing interoperability in advance so that problems regarding standard formats of output reports may not be faced by them in future. The mistakes committed by developing countries can be removed by preparing certain standards and interoperable systems. Good governance can be achieved through applying interoperability in various systems of Governance. Interoperability in the e-governance is must as it will remove the barriers while implementing and replicating e-governance projects. Systems interoperability depends on particular context in case of two or more systems. For utilizing services on the Government portal also there is need of integration and interoperability. These two important issues along with will power of politicians are to play a major role in becoming India a best e-governed country.

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