1.1 Introduction

Information Technology has a great potential. It has impacted a lot to the citizens and society. Huge investments have been made by Government and Private organisations in IT sector to tap the potential of IT. In past various tools (Radio, T.V. and Computer) of Information and Communication Technology (ICT) has impacted the society. Important and puzzling aspect is the impact of ICT tools on a common man. Many academic researchers have tried to answer this question at the theoretical and empirical levels and it was found that one of the major and effective impacts of these technologies on a common man is through e-governance, whose base is ICT. The common man discussed here in the study refers to large population living in rural areas and are devoid of good facilities and infrastructures as compared to urban population. These facilities and infrastructure include education, medical, transport, electricity and many more.

IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information securely. The advent of ICT in the recent years has presented an opportunity for the IT personnel of Government to change the way organizations have worked in the past. Performance of government organisations is not measured by the profit and loss rather by their ability to deliver services online. Ability to understand the citizen and their ability to use the resources are the key factors in matching services to citizen needs.

ICT is the most pervasive and cross-cutting technology tool which can be applied to the full range of human activities. It is multifunctional and flexible to meet diverse needs. Increasing strength of satellite communication, fibre optics technologies, microelectronics, computing technologies and several other material technologies have made
modern ICTs accessible to large majority of ordinary people in almost every walk of their lives. ICT will have to play role in the governance of a country at centre and various other intermediary levels (Pardhasaradhi Y., 2009).

ICT implies the technology which consists of electronic devices and associated human interactive materials that enable the user to employ them for a wide range of teaching - learning processes in addition to personal use. These technologies include computers, the Internet, broadcasting technologies (radio and television) and telephony.

Researchers have faced two main difficulties in this field. On one hand, there is still confusion about many definitions of ICT. On the other hand, ICT is evolving technology and its effects are difficult to isolate from the environment. The relationship between the use of ICT and its impact on general public i.e. common man in the society is not clear, and there are contradictory results in the literature. There are two sided views about positive and negative impacts of ICT on a common man and young population of the country. ICT has affected people directly or indirectly. On one side people talk only about the positive impact of ICT on the common man and while others say it has deteriorated the ancient earned culture of the country and talk about its negative aspects. ICT equipments and their use are growing very fast in the European Union, whereas its adoption in Asian countries is comparatively slow and differs from country to country and state to state.

1.2 Implications of ICT in India

India, officially the Republic of India, is situated in South Asia and one of the fastest growing economies of the world. India is administratively divided into 28 States (federal units having own democratic mechanism of government) and 7 Union Territories (directly administered by federal government). In India, the Department of Electronics (DoE) was established in 1971 for recommending and implementing policies for the country’s IT sector. The National Taskforce on Information Technology and Software Development was established by the Prime Minister of India on 28th May 1998 to formulate a long-term National IT Policy for the country and to remove impediments to the growth of the IT industry. The main objective was to assist India emerge as an IT
software superpower. In 1999 National Telecoms Policy of India was enacted to provide affordable and effective communication systems for citizens; achieve a balance between the provision of universal service to all uncovered areas and of high-level services capable of meeting the needs of the country’s economy; and create a modern and efficient telecommunications infrastructure taking into account the convergence of IT, media, telecom, and consumer electronics and, thereby, propel India into becoming an IT superpower. Later on, IT Act 2000 was adopted focusing the legal recognition of electronic contracts and digital signatures (Rahman H., 2010).

By utilizing latest ICT the government departments can not only maximize access to information, but also can bid farewell to the traditional way of working of Government departments. With the help of ICT the governments can now provide the right information to the right people at the right time. Availability of the enterprise-wide information can be an asset to the government as well as to the entire population (available at www.modelling.nic.in).

With communication costs dropping, transferring knowledge is becoming economical than ever. So there is a unique opportunity for developing countries to tap the vast resources of the global information and leap over knowledge gaps that have accumulated over centuries. But, developing countries can take advantage of the large stock of global knowledge only if they develop the technological competence to grab it.

The emergence of ICT has launched a global debate (digital or technological revolution) about a paradigm shift from an industrialized to Information Society. The application of ICT is the instigating factor of transformation, which will result in far reaching changes within all parts of the economy, the society and the State. The State plays therefore an important role for this transformation. First, the creation of a "New Economy" which stands for a branch of industry that develops and produces hardware, software and communication equipment and its penetration and application into the whole economy. The emergence of e-buzzwords such as e-commerce or e-business is related to the application of ICT within the economy. Second, after a liberal policy implementation through the State, it has to care for social aspects such as to connect the society to the Internet and create a digital literate society. This "second stage" of the Information Society has its expression in the common used catchword "digital divide".
Finally, the State itself comes under pressure to apply ICT within government institutions, expressed by the latest catchwords of e-government and e-governance.

Supporters of e-governance and international development organizations stress the slogan (e-governance) for the purpose of poverty alleviation, improved living standards and economic growth, in developed and particularly in developing countries. Moreover, the literature concerning both catchwords, is full of positive expectations (i.e. enhance participation, accountability, transparency and overall democracy) and thus, they are seen as a medium to implement and support their theoretical concepts New Public Management (NPM) and Good Governance. Fairly few observations in developed countries stressed the significance of internal structures within governmental institutions which can influence the introduction of ICT in general and the developing countries.

With the emergence of ICT a new powerful group within the public administration can evolve which will challenge existing power and authority holders. Thus, in stabilizing and guaranteeing their traditional economic and informational resources, the patrons (top officials) have to co-opt with the ICT unit to control over the access, transfer and selection of information.

Information and Communication Technology by itself is nothing and can not solve all to the world’s problems. But it can be a powerful tool to facilitate and enable affordable solutions for firstly the infrastructure development, secondly the basic human needs, quality of life and development i.e. education, healthcare and empowerment, thirdly the economic development i.e. entrepreneurship, investments, employment and revenues, lastly and most importantly the good governance i.e. improved citizen services and high internal efficiencies (Kalsi et al., 2008).

**ICT in education**

A wide range of ICT equipments and elements have been deployed in present society recently. Notable applications include databases, e-mail, web sites, social networking tools (such as chat rooms, bulletin boards, and discussion boards) and blogs. Blogs are nothing but websites having features of ongoing posts of information, ideas,
commentaries and other content. In the last decade, the presence of these technologies within tertiary has expanded exponentially, and touched virtually all dimensions of the society. Electronic databases keep student, staff, and administrative records, as well as course and library materials. University web sites situate institutions both globally and locally, providing a public image that can be accessed from anywhere in the world, at any time, and serving as an informational crossroads for all members of the community interested in engaging with the institution. ICT resources—like e-mail, instant messaging, and online social networking spaces—provide avenues for academic collaboration, joint research, and personal and professional networking. Computer laboratories give students and staff access to hardware and software for coursework and research. Continuously available wireless networks and remote-access library databases have altered the notions of time and place for work and study on campuses. Networked classrooms, equipped with a range of audio and visual equipment, have expanded the range of materials that may be introduced to students and the methods by which information and ideas can be shared. The Open Educational Resources (OER) movement started in 2001 by the Massachusetts Institute of Technology (MIT) in the United States with its open courseware initiative. OER provide free access to courses, curricula, and pedagogical approaches not available locally. And finally, various combinations of online and virtual resources have laid a most important foundation for the expansion of the distance-education sector in the last decade.

Teaching/learning paradigm has undergone a vast change in recent times. Usage of web has made learning/teaching independent of time and location. Courseware hosted at one place can be accessed globally on demand on 24×7×365 basis. An intelligent interactive courseware having simulation, animation and audio clips combined with educational technology has made it a lucrative option enhancing the efficiency of learning. Computer assisted instruction has undergone vast transformation. Introduction of artificial intelligence and entry of Internet contribute significantly for this. Computer usage in education has supported knowledge transfer (Sirohi V., 2008).

The extent, to which new technologies and digital applications are implemented, differs importantly across nations and institutions. Unfortunately, digital divide has taken place between richer and poorer countries and institutions, because of implementation of
these new technologies and digital applications. At the institutional level, for example, elite, resource-rich research universities with ample means to access and support state-of-the-art technologies may choose not to employ technology in ways that dramatically expand access, given their missions to serve small numbers of carefully selected, high-performing students and scholars. At the other end of the spectrum, large distance-teaching institutions around the world are eager to employ ICT to expand access, but are hampered by resource-infrastructure deficiencies (Guri-Rosenblit S., 2009).

In many developing countries, new technologies are often considered the key to realize successful cost-effective strategies for increased access to higher education. Yet, there are enormous costs and difficulties embedded in the reliance on ICT. Hardware, software, technical support, training, and continual upgrades are all expensive. And the effective deployment of new technologies in countries where even reliable access to electricity is uncertain complicates the matter. The reliance on older broadcast technologies such as radio and television is perceived as less attractive and innovative by many people. The fact that the regions of Africa, the Middle East, and Latin America/Caribbean constitute just 17.2 % of the world's Internet users (available at www.internetworldstats.com) highlights the key underlying issue of technology infrastructure and access in the developing world.

One of the most notable aspects of the ICT revolution over the last decade is the degree to which excitement about new innovations has failed, in many respects, to meet highly optimistic expectations. Still, the innovative technologies that have emerged in recent years have had a real impact on tertiary education across the globe, presenting the sector with an enormous range of opportunities along with some significant challenges. The ICT explosion does hold the promise of breaking down barriers of time, space, lowering costs, enabling collaboration and creativity in teaching, learning, and research. Particularly in the world's wealthier countries, there has been great progress in these areas. In other parts of the world, however, the penetration of ICT into higher education has exacerbated the gap between knowledge producing "centers" and knowledge-consuming "peripheries" (Altbach P.G., 1998). The world's poorest countries are increasingly left behind as information production and dissemination moves down technological pathways to which they have limited or no access. Everywhere enormous
financial strains have been placed on institutions and systems trying to equip themselves for the information age and then keep up with subsequent innovation. It is extremely costly, for example, to train and compensate skilled staff using new technologies; provide access to expensive online journals and databases; and assure the security of electronically stored data. There are also very real financial and moral/ethical challenges embedded in the process of dealing appropriately with the scenario of ICT in the modern world. Meanwhile, research indicates that, even in the face of incredibly powerful and innovative technologies, teachers in both developed and developing countries remain central to the learning process (Guri-Rosenblit, 2009).

Distance learning has been in existence for generations, but the sector has been transformed significantly over time with the advancement and application of new technologies. Beginning with mail correspondence in the early 20th century, distance education benefited from the emergence of radio and TV platforms, followed by CD-ROM technology some two decades ago. The distance-learning landscape was then dramatically expanded and transformed by the introduction of the Internet, along with such key applications as e-mail and electronic messaging. ICTs have exponentially boosted the potential of distance education to reach enormous new pools of students. It has also allowed for real growth in numbers and types of providers, curriculum developers, and modes of delivery, as well as innovations in both pedagogical approaches and content. Today, print and electronic options are both employed around the world, and the delivery of open and distance education is typically understood to fall into two distinct categories—synchronous and asynchronous. Synchronous delivery involves all participants at the same time, while asynchronous delivery implies engagement by the various parties involved at different times (available at www.portal.unesco.org).

There is a recognized typology of institutions providing distance education. These include single-mode institutions, dual-mode institutions, consortia, and nontraditional providers. Single-mode institutions focus exclusively on providing distance education, while dual-mode institutions offer a combination of distance education and more traditional face-to-face course and/or program options. Consortia are comprised of two or more institutions working collaboratively to provide distance learning. Finally, nontraditional providers may include entities such as multinational corporations,
nongovernmental organizations and development partners, as well as governments. Even if they have sufficient resources, it may not be very cost effective for such systems to invest heavily in this area, particularly in light of the constant need to upgrade facilities and technology. In addition, the ephemeral nature of knowledge in today's fast-paced global information society means that many developments in key fields—such as economics, finance, the sciences, and technology—are extremely fast paced, while the life span of innovative products is quite short. The demands inherent in building and retooling new programs to keep up with these developments may make it more desirable to access programming via distance-education methods. Of course, all of this does not mean that well-resourced small countries cannot themselves become major providers of distance education. In 2000, the government of Mauritius proposed a plan for developing the country into a knowledge hub, with building its capacity to provide distance learning as one of its eight strategic initiatives (Mohamedbhai G., 2008).

1.3 Projects based on ICT in Haryana

Haryana is one of the leading states in India. Haryana has a glorious history going as far back as the Vedic Age. The State was the home of the legendary Bharata dynasty, from which the country derived its name ‘Bharat’. Vedas were written here; Lord Krishna delivered the famous Bhagwad-Gita sermon in the midst of Mahabharata War; and on this very land, Ved Vyas wrote the epic ‘Mahabharata’ in Sanskrit. Haryana is one of the smaller states of Indian Union with only 1.37% area (44212 Sq Km) and 2.09% population (around 253 lacs) of India.

The education has vital role in building the society. It is a continuous process of lifelong learning, essential for human resource development. Education is a strong instrument for bringing about upward economic and social mobility (Dahiya S., 2012). Haryana is one the front ranking states in the arena of the IT revolution in India. Haryana has implemented many projects based on ICT. Some important projects based on ICT are
Edusat Project

Indian Space Research Organisation (ISRO) has launched a communication satellite called GSAT-3 for exclusive use of the education sector. It has capacity of development of a nation-wide education network called EDUSAT with the aim of providing a sustainable distance education. This project was launched, by Honorable Prime Minister of India on 19th May, 2007 from Hisar in Haryana, to meet the challenge of a shortage of good, qualified teachers and the need for providing standard quality education to the largest number of students, by the Haryana government in collaboration with the Union HRD ministry and ISRO. Later on in Mid June 2011 ISRO has ordered to shift the Haryana traffic from EDUSAT to INSAT-4CR because of various technical and operational problems Edusat network.

Edusat project is meant for imparting education through satellite. The project has been implemented in Government colleges and schools of the state in the first phase. Initially the project was started for Government colleges and Government schools and later on it was decided to expand the facility in private aided colleges in Haryana. State level quiz and declamation contests in various subjects have been organized and broadcast through Edusat during the session 2010-11 and a few lectures on Music/Films/Theatre have also been delivered. Initially the project was implemented for final year students and in the year 2009-10, Edusat programme has been introduced for B.A., B.Sc. and B.Com 1st year and now from the next session 2013-14, it is being implemented for all classes at college level. In the beginning lectures were delivered online but from the session 2012-13 recorded lectures are being transmitted. The Edusat network of Haryana is shown in Figure 1.1.

SSA Project

The Sarv Shiksha Abhiyan (SSA) is implemented at secondary level school education in Haryana. This project is being implemented by state government with major aid from centre Govt. and World Bank. It encourages states to use ICT and the satellite EDUSAT (Education Satellite) to provide distance education within states to supplement school
education. Management Information System (MIS) tool under SSA is a significant part of the project as it facilitates monitoring of the physical and financial parameters of the scheme. The system has District Level, State Level, and Ministry Level modules (available at www.infodev.org).

![Figure 1.1 Edusat Network in Haryana; source: (www.schooleducationharyana.gov.in)](image)

**Computer Education Project**

The Project is to be implemented in public-private partnership (PPP) model mainly on a Build Own Operate/ Build Own Operate Transfer (BOO/BOOT) basis. The BOO/BOOT Operator shall be responsible for establishing the IT Hardware, furniture and fixtures, power back up facilities, LAN, Lab Technician in the ICT Lab, and a Help Desk. BOO/BOOT operator is also entrusted with the maintenance and upkeep of the ICT Lab during the 5-year project period. The model was implemented in colleges and schools earlier. But now in some of the government colleges’ computer labs and infrastructures
have been provided by the government and computer instructors have been employed to provide computer education. Computer education project is still running on PPP model at school level in Haryana. Project is being implemented by HCL Infosystems Ltd, Chandigarh, SAN Media Ltd., Core projects and technologies Ltd, Mumbai in various schools.

Another ICT based application implemented in schools is bio-metric based attendance monitoring system. These devices are being implemented in various schools by Core projects and technologies Ltd, Chandigarh. NComputing enables computing access for many students with less number of resources. Cost and complexity of maintaining computing infrastructure is high, especially in rural and remote parts of the country. It is being done with the help of desktop virtualization or shared computing and with 1/3rd of the total cost. The scheme has been implemented in 2622 government schools under the project name ‘ICT in Education’. Each school has been provided 22 seat computing lab comprising 20 Ncomputing x550 virtual desktops and two desktop PCs, one UPS and two printers. It takes less power and easy to manage (available at www.eindia.eletson.com)

With the changing scenario in Higher Education basic computer education/awareness has become a pre requisite for getting employment in most of the sectors, computer education programme need was felt to be initiated in all the government colleges where all the students can have the opportunities to learn the basics of IT education and be enabled with sufficient IT skills to obtain basic level employment in the booming IT sector on completion of their college education. 74 Govt. Colleges out of Total 80 colleges have already established computer labs. (Two labs in 69 colleges and one lab in 5 colleges each) and computer, equipment, accessories and furniture etc. have also been supplied. The students passing out from such colleges will be having basic knowledge of ICT.

This knowledge will make them a better citizen of future and they will be able to use electronic gadgets and ICT tool effectively. Such citizens will be able to use e-governance services from the nearby kiosks installed in their neighborhood. E-governance kiosks are to be installed at least one on the four nearby villages. To provide such basic level compulsory computer education has been introduced (Level I, Level II,
Level III) along with B.A./B.Sc./B.Com degree courses. However, if a student fails to clear any of the level he/she may be given opportunity to clear it along with 2\textsuperscript{nd} year or 3\textsuperscript{rd} year. After passing each level respective certificate will be provided to the students jointly by the university and college itself. Students not passing such exam will not be awarded degree from the Universities. This certificate will be in addition to their B.A./B.Sc./B.Com. Degree. From the next academic session 2013-14 Government is also contemplating to make online admissions in various government colleges.

1.4 Operational Definitions of the Terms Used

The following definitions have been used frequently in the study. Some of the definitions are

1. **Information Technology**

It is the study design, development, implementation, support or management of computer based information systems, particularly software applications and computer hardware (Pardhasaradhi Y., 2009).

Information Technology is a scientific, technological and engineering discipline and management technique used in handing the information, it's application and association with social, economical and cultural matters. – UNSECO

2. **Information and Communication Technology**

It is that technology which uses the information to meet human need or purposes including processing and exchanging. Information and communications technology (ICT) in education is the processing of information and its communications facilities and features that variously support teaching, learning and a range of activities in education (available at www.mu.ac.in).

Information and Communication Technologies are defined, as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information (Pardhasaradhi Y., 2009).
All these definitions combine Communication Technology (CT) and Information Technology (IT) that have in line between them but cannot do away without each other. Also the combination of two technologies namely IT and CT has given birth to ICT. The need of such combination was because processed data is of no use if it can not be communicated effectively and speedily. On the other side speedily communication of data is of no use if it can not be processed speedily. Both communication and processing speed gave birth to a new term namely ICT. When these technologies are applied in the field of Governance, it is termed as e-governance. In the era of Computer technology the term ICT mainly focuses on the infrastructure, devices and sources of computer technology and thus it is imperative to discuss about the use of ICT in governance sector by focusing mainly on computer based technology.

3. E-governance

Many definitions exist for e-governance in the literature. In the present context, e-governance is defined as the application of ICT to improve the governance and the interaction between the government and the governed. Some of the other definitions are given here as follows:

E-governance is a method to provide good governance to citizens and is participatory, transparent and accountable in terms of characteristics. Therefore the objectives of e-governance are similar to the objectives of good governance. Good governance can be seen as an exercise of economic, political, and administrative authority to better manage affairs of a country at all levels, national and local.

E-governance incorporates all those processes and structures by means of which the new information and communication technologies (ICTs) can be deployed by government to enable the following:

• Administration of government (E-Administration) and delivery of services to the public (E-Services). This generically constitutes electronic government (abbreviated as E-government).
• Informing, vote-enabling, representation-enabling, consulting and involving the citizenry in, among others, broad consensus making in society in matters pertinent to decision making in political, social and economic priorities in government. This
constitutes Electronic Democracy (abbreviated as E-Democracy) (Narvaneni Yaswanth, 2004).

Concept of e-governance means the process of decision-making and the process by which decisions are implemented. The Concept of e-governance relates to the quality of relationship between government and citizens whom it serves and protects, e-government could be defined as one in which concerned authority (if any) exercise power, exerts influence and manages country’s social as well as economic resources leading to better development. It can be said that governance has social, political and economic dimensions (Deva Vasu, 2005).

E-governance is the application of information and communication technologies to transform the efficiency, effectiveness, transparency and accountability of informational and transactional exchanges with in government, between governments, agencies of national, state, municipal and local levels, citizen and businesses, and to empower citizens through access and use of information (available at www.modelling.nic.in).

E-government refers to transformation of the business of government processes, operations and transactions driven primarily by ICTs (Tripathi Vishwas, 2007).

E-governance is defined as the process of using information technology for automating both the internal operations of the government and its external interactions with citizens and other businesses. The three main target groups that can be distinguished in e-governance concepts are government, citizens and businesses/interest groups. The external strategic objectives focus on citizens, businesses and interest groups, the internal objectives focus on government itself (Ramessur T. S., 2009).

E-governance can be simply defined as the application of ever evolving ICTs in the processes of governance, thereby bringing in a profound institutional change in the delivery of government services to the citizens (Pardhasaradhi Y., 2009).

E-governance refers to the public sector’s use of Information and Communication Technologies (ICT’s) with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective (available at www.unesco.org). It involves new styles of leadership, new ways of debating and deciding policy and investment, new
ways of accessing education, new ways of listening to citizens and new ways of organizing and delivering information and services.

This definition shows that e-governance is not about automation of existing government systems but it is a tool that has the capability to transform the way government and citizens interact (Parambil Santhosh Shabeer Babu Cherooli, 2011).

Various definitions are consolidated in the Figure 1.2.

![Figure 1.2 Broad definitional scheme for e-governance (source: Narvaneni Yaswanth, 2004)](image)

E-governance is becoming the backbone of any country’s growing economy in today’s world of internet enabled systems and processes. The word “electronic” primarily indicates the usage of technology in all matters of governance. This includes Government-to-citizens (G2C), Government-to-Business (G2B), Government-to-employees (G2E), Government-to-Government (G2G) as well as interactions and processes happening at the back office system levels within the entire government frame work. In e-governance, government tries to leverage technology to make all its services available to its different stake holders namely citizens, businesses and government itself in an efficient, effective and transparent manner (Goel S. et al., 2012).
(A) Governance

For better governance purposes a state is divided into districts and district (headed by Deputy Commissioner) is divided into several Blocks, each of which is headed by a block development officer (BDO). Each block, in turn, is usually divided into several Tehsils, headed by a Tehsildar. In this way political and administrative setups are closely interlinked at the district and sub-district levels. For example, the CEO of the Zila parishad is a bureaucrat, although the Zila parishad itself is made up of elected representatives, including representatives from the mandal (Praja) parishads from the different mandals within the district. The mandal parishad or council comprises the heads of the panchayat samitis, and some co-opted resource persons. Each panchayat samiti, in turn, has representatives from various Gram Panchayats (Village Councils), which is the basic tier of local government (Rahman H., 2010).

Decentralised governance helps in identifying the needs and preferences of people through their direct participation in plan formulation and implementation. It ensures accountability and produce greater transparency. Decentralised governance is based on three-tier structure of local self government. The three-tier structures of Panchayati Raj are Zila Panchayat at the District level, Taluk Panchayat at the intermediate level and Gram Panchayat at the Village level (Islam N., 2003). Panchayati Raj System has made the statement true that says independence must begin at the bottom (Roy Ash Narian, 2007).

The universally accepted characteristic of the governance include participation, rule of law, transparency, responsiveness, equity, inclusiveness, effectiveness, efficiency and accountability (Deva Vasu, 2005). Governance is the exercise of economic, political and administrative authority to manage country’s affairs at all levels. It comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences (Pardhasaradhi Y., 2009).

The term governance may be described as the process by which society steers itself. In this process, the interactions among the State, Private Enterprise and Civil Society are being increasingly conditioned and modified through the influence of Information and Communication Technologies (ICTs), constituting the phenomenon of e-governance.
From governance to E-governance

Governance is the act of governing by the governments or any other organizations or agencies which can be defined as “The manner in which power is exercised in management of a country’s economic and social resources for development”. Hence, governance can be simply put as the process of decision-making and the process by which decisions are implemented (or not implemented). Since governance is the process of decision making and the process by which decisions are implemented, an analysis of governance focuses on the formal and informal agencies involved in decision-making. E-governance is the efficient use of Information and Communication Technology (ICT) at all levels of government set up in delivering citizen services to common man and also to the corporate world (Mohd. Noor K. B. et al., 2011). In the modern age of ICT and global world it is the need of the hour to switch from traditional governance to e-governance. Such an e-governance will have far reaching effects in general and specific for a populous democratic country like India. There are so many challenges in society and to handle them effectively e-governance is must.

(B) E-governance

In the last decade concept of e-governance was seen as a new process with unlimited potential in the global environment. Electronic governance involves new style of leadership, new ways of debating, and deciding policy and investment, new ways of accessing education, new ways of listening to the citizens and new ways of organising and delivering information and services. E-governance is important to improve efficiency and effectiveness of government. Technology can not work in isolation and if it works is of no use. That is why technology will have to reach out to one and all. Citizens want to receive services they need any time and at low cost. That is why information must be kept in form so that information can be provided to the people round the clock and at minimum cost. The potential of ICT has been universally recognised in delivering services to the citizens through public and private sectors. By deploying IT to the existing government processes and reengineer the processes can lead the paper less society. For complex transactions the provision of the interactive online services will give citizen access to government services at anywhere and anytime basis conveniently.
In this world of constantly evolving technology and its enabling power, these technologies can be one of the key enablers of citizen centric services, delivery mechanism to create easily accessible interfaces such as one-stop, single-window, automated service delivery outlets or common public service centers, devoid of harassment or corruption, minimizing waiting time and inconvenience to the public. Technology can be used to reduce paper work, improve efficiency, transparency, accountability and expedite the decision making process. Technology can also be used to break down barriers between departments and bring about ‘anytime, anywhere’ government services to the citizen (Shah Neeta, 2008).

**Common Interactions in e-governance**

With the help of ICT it is possible to connect people, government and business. Government services can be classified under various categories namely informational, interactive, and transactional. In the informational type governments generate huge volumes of information which is organized and regularized. The internet and other advanced communications technologies can bring this information quickly and more directly to citizens. This includes publishing government information online, enabling the citizens and businesses to readily access the government information online. Interactive e-government involves two-way communications, starting with basic functions like e-mail contact information for government officials or feedback forms that allow users to submit comments on legislative or policy proposals. Last type namely transaction involves transaction between the government and citizens. The government can create websites that allow users to conduct transactions online like other private businesses and e-commerce (Narvaneni Yaswanth, 2004). Common interactions in e-government are shown in Figure 1.3

Generally two terms namely e-governance and e-government are used interchangeably. Also same is used in the thesis also. But at the same time it is better to clear the difference between these two terms. In the case of e-government the services and information are delivered to the citizens or clients through electronic medium while in the case of e-governance, the interaction between the citizen and the government takes place through electronic medium and decisions are processed electronically. It is necessarily more interactive and goes beyond e-government. E-governance is generally
considered as a wider concept than e-government, since it can bring about a change in the way citizens relate to governments and to each other. E-governance can bring forth new concepts of citizenship, both in terms of citizen needs and responsibilities. Its objective is to engage, enable and empower the citizen (Kulkarni R. A. et al., 2013).

1.5 E-governance Evolution

Evolution of e-governance is a highly complex process requiring provision of hardware, software, networking and re-engineering of the procedures for examination of cases and
decision making. The concept of e-governance has its origins in India during the seventies with a focus on development of in-house government applications in the areas of defense, economic monitoring, planning and the deployment of IT to manage data intensive functions related to elections, census, tax administration etc. During eighties computers of good technology were not available and were very costly. Computers at that time were mini computers and main frame computers. At that time computers were just used for the purpose of scientific calculations and economic planning. It was a pre Internet era and main focus was to enable connectivity and faster information sharing within the government. Setting up of National Informatics Center (NIC) in 1977 to develop and manage information system for Govt. of India (GOI) was first step taken toward ushering India into e-governance era.

National Informatics Centre (NIC) of the Ministry of Information Technology (MIT) has been instrumental in steering ICT applications in government departments at Central, State and Districts, facilitating improvement in government services. The efforts of the NIC to connect all the district headquarters during the eighties was a very significant development. From the early nineties, IT technologies were supplemented by ICT technologies to extend its use for wider applications with policy emphasis on reaching out to rural areas and taking in greater inputs from NGOs and private sector as well. There has been an increasing involvement of international donor agencies under the framework of e-governance for development to catalyze the development of e-governance laws and technologies in developing countries (available at www.egovindia.org).

Later on 1990 impelled GOI to explore avenues for delivery of citizen services through IT solutions. With the advent of new technology in the computer world personal computers with high computing facilities came into existence and office automation work had been started. During this period in the e-government sector office computerisation need was felt of. With the advent of high capabilities of computers, Internet and WWW new era of e-governance had started. This decade saw various e-governance initiatives in the country at block, district, state and national levels by NIC. New websites started to appear in this period. With the increase in internet and mobile connections, the citizens are learning to utilize their new mode of access in wide ranging ways. People have started
to expect more and more information and services online from governments and corporate organizations to ease their civic, professional and personal lives. Every state government had taken initiatives to form an IT policy and document for the state and the citizen charters had started appearing on government websites.

With the primary emphasis on automation and computerization, state governments have also attempted to use ICT tools into connectivity, networking, setting up systems for processing information and delivering services. At a micro level, this has ranged from IT automation in individual departments, electronic file handling and workflow systems, public grievance systems, service delivery for high volume routine transactions such as payment of bills, tax dues to meet poverty alleviation goals by promoting entrepreneurial models and provision of market information (available at www.egovindia.org).

Some of the earlier computers, up to 1960’s that formed the basis of latest computers and e-governance in India, are shown in Table 1.1. Some major events that took place in ICT and e-governance are shown in Table 1.2.

**Table 1.1  computers used India till 1960**

<table>
<thead>
<tr>
<th>S.R.</th>
<th>Year</th>
<th>Computer</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1950</td>
<td>Analog Computer</td>
<td>First Analog Computer at the Indian Statistical Institute (ISI), Kolkata (now Kolkata)</td>
</tr>
<tr>
<td>2</td>
<td>1953</td>
<td>Analog Computer</td>
<td>Indigenousy built installed at Indian Statistical Institute, Calcutta (now Kolkata)</td>
</tr>
<tr>
<td>3</td>
<td>1956</td>
<td>HEC-2M</td>
<td>Hollerith Electronic Computer, a digital computer, from England, installed at Indian Statistical Institute, Calcutta (now Kolkata)</td>
</tr>
<tr>
<td>4</td>
<td>1958</td>
<td>URAL</td>
<td>Russian computer, under United Nations grant, installed at Indian Statistical Institute, Calcutta (now Kolkata)</td>
</tr>
<tr>
<td>5</td>
<td>1959</td>
<td>TIFRAC</td>
<td>Tata Institute of Fundamental Research Automatic Calculator (TIFRAC) operational, used extensively between 1960-64 .</td>
</tr>
</tbody>
</table>

Source: (Misra D.C., 2009)
<table>
<thead>
<tr>
<th>E-governance and ICT related activity</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian National Sample Survey</td>
<td>1950-51</td>
</tr>
<tr>
<td>Annual Survey of Industry (ASI)</td>
<td>1953</td>
</tr>
<tr>
<td>Dawn of centralized planning</td>
<td>1954</td>
</tr>
<tr>
<td>Second five year plan (1957-62) draft preparation</td>
<td>1954</td>
</tr>
<tr>
<td>Department of Electronics (DOE) setup</td>
<td>1970</td>
</tr>
<tr>
<td>Agricultural Census and Input Surveys</td>
<td>1971-72, every five years</td>
</tr>
<tr>
<td>New Computer Policy</td>
<td>1984</td>
</tr>
<tr>
<td>Policy on Computer Software Export, Software Development, and Training</td>
<td>1986</td>
</tr>
<tr>
<td>NICNET and DISNIC</td>
<td>1987</td>
</tr>
<tr>
<td>Electronic Mail from Mumbai</td>
<td>1991</td>
</tr>
<tr>
<td>Software Technology Park an autonomous society set up</td>
<td>1991</td>
</tr>
<tr>
<td>Internet made available to public in India</td>
<td>August 14, 1995</td>
</tr>
<tr>
<td>National task force on I.T and software development</td>
<td>1998</td>
</tr>
<tr>
<td>Ministry of Information Technology (MIT) created</td>
<td>1999</td>
</tr>
<tr>
<td>Passenger Railway System (PRS) in India operational</td>
<td>1999</td>
</tr>
<tr>
<td>Information Technology (IT) Act comes into force giving legal back to e-commerce</td>
<td>October 17, 2000</td>
</tr>
<tr>
<td>Department of Information Technology (DIT) created</td>
<td>2001</td>
</tr>
<tr>
<td>Media Lab Asia (MLA) launched</td>
<td>2001</td>
</tr>
<tr>
<td>CMC Ltd., a public sector undertaking incorporated in 1975, in the wake of IBM quitting India, privatized</td>
<td>October 16, 2001</td>
</tr>
<tr>
<td>National Institute for Smart Government (NISG) incorporated in Hyderabad, Andhra Pradesh</td>
<td>May 28,2002</td>
</tr>
<tr>
<td>Launching of National E-governance Plan (NeGP)</td>
<td>2003</td>
</tr>
<tr>
<td>Bangalore One(B1) launched with 14 service centers providing 24 different services to citizens of Bangalore on (<a href="http://www.bangaloreone.gov.in">www.bangaloreone.gov.in</a>)</td>
<td>April 2, 2004</td>
</tr>
<tr>
<td>E-Readiness assessment for the Centre and States launched</td>
<td>April 13, 2004</td>
</tr>
<tr>
<td>Recommendations of Second Administrative Reforms Commission</td>
<td>2005</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Registration of .gov.in domain was launched.</td>
<td>January 1, 2005</td>
</tr>
<tr>
<td>The Right to Information (RTI) Act, 2005 came into force</td>
<td>June 15, 2005</td>
</tr>
<tr>
<td>National Portal of India (<a href="http://india.gov.in/">http://india.gov.in/</a>) launched</td>
<td>November 10, 2005</td>
</tr>
<tr>
<td>SEZ Act</td>
<td>2005</td>
</tr>
<tr>
<td>makes its recommendation on e-governance to Prime Minister</td>
<td></td>
</tr>
<tr>
<td>MCA 21 launched</td>
<td>February 2006</td>
</tr>
<tr>
<td>National Summit on E-forms for E-governance held in New Delhi</td>
<td>June 12-13, 2006</td>
</tr>
<tr>
<td>Union Cabinet approves setting up of 100,000 rural Common Services Centers (CSCs)</td>
<td>September 2006</td>
</tr>
<tr>
<td>2,221 “.gov.in” domains stood registered</td>
<td>February 19, 2007</td>
</tr>
<tr>
<td>IT Act amendment</td>
<td>2008</td>
</tr>
<tr>
<td>Unique ID Authority of India established</td>
<td>2009</td>
</tr>
<tr>
<td>National Information Highway Authority (NIHA) in offering</td>
<td>2009</td>
</tr>
<tr>
<td>Clarification on Information Technology (Intermediary guidelines)</td>
<td>2011</td>
</tr>
<tr>
<td>Electronics Services Delivery Act</td>
<td>2011</td>
</tr>
<tr>
<td>Mobile governance framework notified</td>
<td>February 2012</td>
</tr>
<tr>
<td>98,000 Common Service Centres (CSCs) set up</td>
<td>July 2012</td>
</tr>
<tr>
<td>National Institute of Smart governance (NISG), Hyderabad has</td>
<td>July 2012</td>
</tr>
<tr>
<td>inked memorandum of agreement with Indian Institute of Management (IIM) Shillong for setting up centre of excellence for e-governance projects.</td>
<td></td>
</tr>
<tr>
<td>Centre of Excellence for Marathi in technical collaboration with</td>
<td>July 2012</td>
</tr>
<tr>
<td>city-based Centre for Development of Advanced Computing (CDAC) was</td>
<td></td>
</tr>
<tr>
<td>set up by Maharashtra government.</td>
<td></td>
</tr>
<tr>
<td>The Companies Bill, 2011 has been passed by the Loksabha</td>
<td>December 2012</td>
</tr>
<tr>
<td>The Cabinet Committee on economic reforms approved</td>
<td>January, 2013 to July,</td>
</tr>
<tr>
<td>continuation of MCA21 project for its second cycle</td>
<td>2021.</td>
</tr>
<tr>
<td>The National Association of Software and Services Companies (Nasscom) has proposed harmonization of e-governance and IT in the Budget 2013.</td>
<td>February 2013</td>
</tr>
<tr>
<td>Websites of various ministries and state-run departments were down</td>
<td>April 2013</td>
</tr>
<tr>
<td>since late morning due to a technical glitch in the server of NIC.</td>
<td></td>
</tr>
<tr>
<td>Tamil Nadu government today allocated more than Rs 100 crore towards e-governance</td>
<td>May 2013</td>
</tr>
</tbody>
</table>

Source: adopted from (Misra D.C., 2009) and (available at www.economictimes.indiatimes.com)
1.6 National E-governance Plan

The Government of India (GOI) had approved the National e-governance Plan (NeGP) for the period 2003-2007 on November 6th, 2003. Over the years, a large number of initiatives have been undertaken by various state governments and central government. The NeGP 1.0, the current version has its own strengths as the first well organized plan of the Govt. of India for both central and state level e-governance projects. 27 Mission Mode Projects (MMPs) of NeGP had seen their partial successes. The Government has accorded approval to the vision, approach, strategy, key components, implementation methodology, and management structure for NeGP. However, the approval of NeGP does not constitute financial approval(s) for all the Mission Mode Projects (MMPs) and components under it. The existing or ongoing projects in the MMP category, being implemented by various central ministries, states, and state departments would be suitably augmented and enhanced to align with the objectives of NeGP (available at www.negp.gov.in).

NeGP has been partly completed but has certain fundamental gaps and important omissions in its conception and planning. These omissions and missing aspects are critical for the full success of NeGP in future. Even though the IT Act 2000 and Electronics Services Delivery Act, 2011 provide the necessary background and motivation for reengineering of government processes, they do not make major process reforms compulsory.

eBharath 2020 is a vision of the future NeGP 2.0 for the period (2012-2020), succeeding the current NeGP. It emphasizes on major reform and reengineering of government processes, systems and procedures using six sigma techniques with the provision of the proposed e-governance Act 2012 for building large scale mobile cloud applications. Future NeGP 2.0 as eBharath 2020, comprises of 12 steps and gives a vision as eBharath 2020 comprising important steps as analysis of needs, based on surveys, followed by large scale project planning for m-governance and m-services all based on the ubiquitous mobile phones in all service sectors and commerce as m-Health, m-Education, Rural e-Commerce as m-Gram Bazaar (Prabhu C S R., 2011). Framework of a PHC is shown in Figure 1.4.
Lessons learnt from previous e-governance initiatives have played an important role in shaping the progressive e-governance strategy of the country. Due cognizance has been taken of the notion that to speed up e-governance implementation across the various arms of government at national, state, and local levels, a programme approach needs to be adopted, guided by common vision and strategy (available at www.negp.gov.in). This approach has the potential of enabling huge savings in costs through sharing of core and support infrastructure, enabling interoperability through standards, and presenting a seamless view of government to citizens. The national e-governance plan, takes a holistic view of e-governance initiatives across the country.
integrating them into a collective vision, a shared cause. Around this idea, a massive
countrywide infrastructure reaching down to the remotest of villages is evolving, and
large-scale digitization of records is taking place to enable easy, reliable access over
the internet. The ultimate objective is to bring public services closer home to citizens,
as articulated in the vision Statement of NeGP.

"Make all government services accessible to the common man in his locality,
through common service delivery outlets, and ensure efficiency, transparency, and
reliability of such services at affordable costs to realize the basic needs of the
common man" (available at www.indg.gov.in).

Main theme of future NeGP 2.0 is process reform and reengineering of government
processes which have been kept untouched for over sixty five years. After major process
reform, SOA based web services can be identified for life cycle events of citizens which
can then be implemented as the future e-governance grid and cloud of India, deploying
the enterprise architecture for all major initiatives (Prabhu C S R., 2011). All these MMPs
are shown in Figure 1.5.

NeGP seeks to lay foundation and provide impetus for the long term growth of the e-
governance within the country. The plan seeks to create right governance and
institutional mechanisms, setup the core infrastructure and policies and implement a
number of MMPs at various levels and create a citizen centric and business centric
environment for governance. The plan had been approved in principle and endorsement
has been given to the overall program content, implementation approach and governance
structures. Key observations made while endorsing the plan are here as follows.

1) Provides incentives to the states to encourage adoption of plan.
2) Services should be outsourced where ever possible.
3) Potential available in the private sectors must be exploited.
4) Adequate weight age must be given for the quality and speed for the procurement
   procedures for IT services.
5) Connectivity should be extended upto block level through State Wide Area
   Networks (SWANs) or through NIC networks.

Trend of providing services to citizens through Common Service Centres (CSCs) should
be encouraged and promoted (Tripathi Vishwas, 2007).
E-governance infrastructure includes mainly the following four components namely

a) State Wide Area Network (SWAN).

b) Data Centre.

c) National e-governance Service Delivery Gateway (NSDG).

d) Common Services Centers (CSCs).

Figure 1.6 shows the four pillars of NeGP.
a) State wide area network (SWAN) is an advanced telecommunication infrastructure, which is used now-a days extensively, for exchange of data and other types of information between two or more locations, separated by significant geographical distances. The medium of connectivity can be copper, optical fiber cable or wireless, performance of e-governance in Indian economy. A SWAN deployed in a State or UT would have two components namely horizontal and vertical. The vertical component of SWAN is implemented using multi-tier architecture (typically, three-tier) with the State/UT, District and Block Headquarters.

b) Under NeGP, it is proposed to create State Data Centers (SDCs) for the states to consolidate services, applications and infrastructure to provide efficient electronic delivery of G2G, G2C and G2B services. The National e-governance Service Delivery Gateway (NSDG), an integrated MMP under NeGP, can simplify the above task by acting as a standards-based messaging switch and providing seamless interoperability and exchange of data across the departments.
c) The CSC is a strategic cornerstone of the NeGP, as part of its commitment in the national common minimum programme to introduce e-governance on a massive scale. The CSCs would provide high quality and cost-effective video, voice and data content and services, in the areas of e-governance, education, health, telemedicine, entertainment as well as other private services.

d) There are 25 MMPs in NeGP. Various projects along with some additions are


1.7 Benefits of E-governance

E-governance is not just a government website on the Internet. E-governance is the use of Information and Communication Technologies to facilitate the processes of government and public administration to achieve good governance. There are various facets of good governance. For development of a state, one needs to make certain changes to government processes e.g. by decentralization. Objectives are generally to improve efficiency, effectiveness time and money saving. By looking at the advantages of the online services and information for the masses public can demand these due to democratic participation, accountability, transparency and speed of services. From international point of view most of the countries are in the early stages of e-governance. A good start has been made in U.S.A, Australia and Singapore but in the coming years developing countries would also have to take it seriously. Advantages of e-governance would benefit a lot to the state and its people. Some of the benefits of e-governance are
1) Effective implementation of e-governance can take ICT to the common man helping national and state governments to align their services with changing needs of both citizens and stakeholders and to develop the economy.

2) An ICT driven e-governance system primarily involves creation, storage, analysis, dissemination and use of information. It can provide vital inputs to the government’s policy making process.

3) E-governance automates and thereby speeds up the routine administrative functions.

4) E-governance requires change in the government processes e.g. decentralisation will bring efficiency and effectiveness and to save costs.

5) It enables the government to work better, yields higher revenue growth costs less and services to the citizens.

6) E-governance allows real-time participation in the governmental and democratic process.

7) Citizens can freely interact with various government departments anytime, anywhere with minimal effort (Tripathi Vishwas, 2007).

8) E-governance ensures better policy outcomes, higher quality services and greater engagement with citizens.

9) Provision of online services and information increase democratic participation, accountability, transparency, and the quality and speed of services (Kalsi N. S. et al., 2008).

10) It helps in meet out the latest challenges and provides tremendous opportunities in a modern open world economy.

11) New horizons of economic growth and prosperity are opening up and tremendous opportunities from which business world as well as governments can benefit.

12) Globalization and increased high quality corporate services have raised the awareness of the citizens. Citizens like to have public services in efficient way in time. This challenge can be met by shifting focus of governance to the needs of the citizens and that is possible with effective implementation of e-governance.

13) Quality, efficiency and in time services like private sectors is possible only with the proper implementation of e-governance.
14) Investment decisions worldwide are based on the efficient delivery of public services and the consequent reduction in transaction costs rather than geo-political considerations and hence to invite global foreign investment and attain leadership position it is must to have e-governance.

15) E-governance provides integrated government services through a single window by re-engineering of government processes. It can reduce the procedural and postal delays involved in the present traditional and manual systems. This might help control corruption and increase participation of people in policy decision process by improving the degrees of communication between government and public.

16) E-governance is capable of not only speeding up transactions but also transparent functioning. E-governance helps common man minimizing red tape and corruption (Tripathi Vishwas, 2007).

17) It is directly beneficial for the common man as they can use it from anywhere and anytime they like.

18) E-governance solutions are oriented towards helping government organizations transform into digital governments that build services around citizen's choice, make government more accessible, facilitate social inclusion, provide information responsibly, use government resources effectively, reduce government spending, deliver online services, involve citizens in the governing process (available at www.modelling.nic.in)

19) E-governance is used to improve quality of governance products and services, to provide new governance products and services, to enhance participation of people in choice and provision of governance products and services, to bring new sections of society under the governance sphere (including those who are most likeable to remain excluded - namely the poor, the illiterate, the differently-able, indigenous people, the migrants and displaced people).

20) Other advantages of e-governance are documentation, monitoring and control of various projects in social and economic sectors that can be done easily with the help of e-governance projects. Projects having influences in many departments and ministries, implemented at various locations, can easily be monitored.

21) It can help in integration of various ministries and departments for effective planning and evaluation by all government ministries and departments. Instead of planning in
isolation, integrated planning will have a great ramification, otherwise ministries have to write different agencies to get the necessary information then compile it for its planning and decision making exercise which naturally tends to take lot of time.

22) E-governance can help in better understanding of Geographic Information System (GIS) based system and utilities management. It also helps in controlling crime as trouble spots can easily be identified with the help of crime related data and GIS. Based on the outcome security forces can be deputed to the vulnerable locations.

23) E-governance can help in poverty alleviation—identification of below poverty group, combining this with food for work and other job generation projects. It also helps in various welfare projects implemented by governments—the beneficiaries can be easily identified and efforts can easily be made for the benefits to reach the needy ones and also with in the scheduled timeframe. E-governance can help in finding authenticity and verifying particulars of a particular entity required for many beneficiary schemes.

24) E-governance helps in making corruption free society by providing corruption free utilities management in all development areas and identifies the possible areas where corruption might take place; close all the loopholes by employing e-governance.

25) It also helps in revenue generation by elimination of tax evasions, discrepancies can easily be identified and potential areas for more revenue generation can be analyzed on a timely basis. Gujarat ICT enabled tax collection centres at Maharasatra border have shown the increase in tax collection as compared to manual tax collection centres of Maharasatra on the same route.

26) Instead of having a number of cards for driving license, voter identification and to avail various government facilities, a single multipurpose card will eliminate lot of duplicity available in maintaining databases. Many of the problems related with the identity can easily be handled with the UIDAI, AADHAR Card unique numbers. The work in this field is progressing in various states and such numbers are being provided to the citizens free of cost and are more secured than available cards. Once the databases of citizens is created various facilities and schemes can be implemented very easily and it will help in providing services to the needy common man and this way existing corruption in the system can be reduced.
1.8 Challenges for e-governance in India

Projects have got risks of failure, no matter how they are planned and proceed, and e-governance projects are no exceptions. These risks lead to failure or partial success, if not managed properly. This is true in case of e-governance projects as majority of the projects fail here. So the identification and prioritizations of these risks related to e-governance projects are concern for academia and industry as a part of managing these projects. This prioritization helps the decision maker while managing decisions, results in decreasing in e-governance failure rates. Some of the reasons of failure of e-governance projects and its challenges are

- A critical reason for e-governance being less effective is the problem of citizens’ access to the available information sources such as the internet. The major problem is the low rate of internet connectivity, though price is not a major hindrance in this context.
- E-government initiatives in India have gained momentum in the past decade but citizen participation is missing in this sector.
- Another barrier may be the lack of trust in terms of security on the part of users.
- Geographical, social and economical disparities among citizens are the biggest barriers for e-governance.
- Language is one of the major barriers in implementation of G2C e-governance projects in India. Dominance of English on the internet constrains the access of non-English speaking population like Hindi and Punjabi (Ramessur T. S., 2009).
- Illiteracy, lack of infrastructure, security and privacy of personal and financial data are other constraints that hamper e-governance efforts.
- Despite islands of excellence, e-governance has not been able to make rapid progress due to several operational, economic, personnel planning and implementation issues.
- E-governance has also focussed towards investment in hardware and very little on developing software and services, which could maximize hardware investments.
- Generally bureaucrats think that services should be provided to common man at nominal rates. But providing e-governance system in place will cost the
government some money. This makes the service bit costly as compared to the normal procedures.

- Basically mindset of the people involved in the processes and the technical problems involved in using Indian languages in IT sector are the major impediments to e-governance in India.
- Bureaucrats and other agencies also resist implementation of e-governance initiatives because it may end the traditional process in which there are so many loopholes of taking bribe from the common man.
- Present e-governance dishes out information just one way about government policies with a lot of statistics.
- The material provided in the present system is of outdated stuff clouded with bureaucratic jargons.
- In most states e-governance relies on the private participation that gives rise to several other problems like security.
- Employees feel that their status and powers will be finished if e-governance is implemented.
- Employees also fear that this may reduce government jobs and hence are reluctant to e-governance.
- In various government departments a lot of ICT infrastructure is provided but that infrastructure is kept unopened for a long time and hardware becomes obsolete and does not perform as per specification due to this time gap. Many times software is not ready and there is time gap between hardware purchase and development of custom applications and during that time hardware becomes obsolete and does not give better performance.
- Employees also pretend, to say about e-governance implementation, that it is nothing but just giving some services to private sector and instigate various union/organisations to strike against such steps (Tripathi Vishwas, 2007).
- There is lack of awareness in using the e-governance portals. In many states various projects are being implemented but the ultimate user does not about its availability and procedure to get online service. Users do not know the benefits that they can avail from the available e-governance services.
• There is lack of coordination between government departments and software solution developers. Due to lack of this interaction between the two the software designed and implemented may not address the exact requirements of the users and hence may not be implemented. As it normally happens is case of computer based projects that projects designed are not as they were required and requirements are also not as per their needs.

• The attitude and psychology of the government servants is quite different from the private sector employees. Majority of the government sector employees do not want to make change in their working style. In applying e-governance there is need to re-engineering of various current processes. Restructuring in administrative processes, redefining of procedures and formats may need changes.

• There is lack of expertise among management information system (MIS) executives in utilizing the data mining techniques, updating and collection of real time data from the websites. Therefore data collected and maintained by e-governance portals is not reliable and full of gaps.

• In government departments one might have come across shortages or resources in one department and excess of resources in the other. This could be due to non-availability of proper data and facilities to disseminate information. Even if government departments are computerized and networked, for the purpose of internet usage and mail transfer, the information available in one department (which possess the data) could not be utilized in other department. This is because the information is stored in different formats, in different platforms and in heterogeneous different data base systems.

• There is lack of resources and infrastructures to support e-government initiatives in government departments. Government departments’ efforts may be defined as islands of computerisation. Creation of infrastructure is not guided by a uniform national policy, but is dependent on the needs of individual officers performing on a few projects. Also the budget provisions are made on annual basis and grants are released near the end of the financial year and on date bound manner. In such situations infrastructure is procured not as per requirement but only to utilize the
grants in time. In such cases sometimes the hardware or software procured may not be utilized at all throughout the years.

- The LAN or Internet facility provided to government departments is not properly utilized for the purpose it was installed. In many cases such facilities are only used for email purpose and for personal downloading of audio and video clips.

- Many state Governments have formed the IT task force and have their IT policies in place. But these policies are not based upon capabilities and requirements of the state but are based on surveys and strategies used by other nations or other states. Each state has different requirements for implementation of e-governance applications and such policies must be framed after careful study of parameters applicable in particular state (Kanungo Vikas, 2004).

- District information technology societies (DITS) have been created at district levels but meetings of such societies are organized once in a year to complete the formalities and not for the purpose it was built for. Main agendas in such societies are related with attending conferences in foreign countries, pass out annual budgets and sanction to use Red Cross funds etc.

- Out of all these challenges and barriers one of the most important challenges is security of the portals and websites providing such e-governance services online to its users/consumers/citizens. Reasons may be privatization of such services or utilization of cloud services for implementation of e-governance projects.

To remove these barriers citizens’ participation should be increased against these constraints to earn good returns on investment from our e-governance efforts. The more benefits will be achieved if the e-governance is citizen-centric which itself will transform citizens to become active participators in establishing e-democracy (Srivastava Dimpi and Sharma B.K., 2010).

E-governance projects risks identification and its prioritization results in better management of projects and reduce failure rates. It gives a better picture of risks involved and helps the manager to manage the project in a better way. It reduces the failure and focuses more on better utilization of resources towards better management of e-governance (Mahalik, D. K., 2012).
Need and challenges of e-governance in democratic India

After IT and its use for public, internet supported digital communities have evolved. If e-governance is available then it can provide following advantages to rulers and the ruled. There are several reasons for giving importance to e-governance in context of democratic states like India.

1) Firstly, elected representatives need access to information and communication resources. It is necessary for them to inform and listen to their people, communicate with one another is also necessary for them and at the most basis, it is necessary for them to discover and represent the wishes of those who have elected them as their representatives.

2) While electing individuals in elections, one appreciates and understand normally about the three sometimes opposing forces namely
   a) Own conscience
   b) Philosophy of the party
   c) Interest of his constituency itself

One has right to communicate with politicians directly on these points which is not possible in the traditional form of governance or system.

3) E-mail between politicians and between politicians and departments can be easily established which is not possible now days and is must in democratic society.

4) Many governments are providing lap tops to their Members of Parliament (MPs) and Members of Legislative Assemblies (MLA’s), to publish their home pages and interact with public. This then touches on the next aspect, that of communicating with the people.

5) In addition to the standard channels and mechanisms, the politicians can receive email messages from those wishing to express their views.

6) People are now aware about the Right to Information (RTI) act (available at www.indg.in) and in the light of this act one may be asked to provide any information desired (under its purview). Hence computerization and e-governance available in one’s department may help a lot.
7) There are similarly endless ways to utilize Information and communication technologies (only limited by the imagination of the implementing agency) to provide efficient and transparent solutions to citizens.

8) Impact of citizen centric e-governance applications on citizens is poor because of different objective i.e. to gain political advantage rather than offer better service to the citizens.

9) As stated earlier, the scope of e-governance is not merely restricted to public services. Integration across government departments is often not planned properly till date.

10) The famous single window concept does not work and citizens still have to visit different citizen service centers spread within cities or towns.

11) The complaints related to various bills like water meter bill, electricity bill, telephone bill can be registered in some states on line, but tracking of the rectification process is still manual. It is because of the fact that front-end interface is computerized, and back office is not automated properly and not linked to front-end services.

12) Number of independent web-sites exist but, still can not be used as a reliable source for government level information. Since services are not integrated (for instance, registration of property and maintenance of land records), citizens have to face problems arising out of data inconsistency.

13) However, transparency is not experienced and seen in the implementation of a majority of government schemes. As per news report and views expressed by the government authorities, high level of corruption still exists in releasing of funds for various projects implemented by centre Government.

14) Decisions taken by politicians (M.L.A or M.P) for launching new schemes, if based on correct data, will genuinely benefit the citizens.

15) E-Governance services such as driving licenses still require hiring of middleman. Citizens expect that they themselves should be able to interact with government for all their needs.

16) Lack of security on various websites and portals still exist and that dissuade users to use online services for money transactions. Many people even do not use ATM cards to withdraw money and buying of tickets because of security reasons.
17) Citizens from all segments of the society are confused as whom to approach for solving their various problems. UID card issued to citizens is to be used because of its biometric characteristics and uniqueness and consequently will reduce some of the above mentioned problems related with the identification of users.

1.9 Security in e-governance

One of the most important tasks in any e-governance model is to protect and provide the security to the information. While talking about the security aspects, there is a need to look into both policing and preventive measures. What you share, in good faith, can be exploited against you. The more you open up to share, the more vulnerable you make yourself. Success of an e-governance model would depend upon the perception of an individual about its effectiveness in securing information (Sharma V., 2002).

In the recent years, governments around the world are embracing the digital revolution to enhance services for its citizens. Government services are provided using electronic media anywhere and anytime. Security is considered one of the crucial factors for achieving an advanced stage of e-government. As the number of e-government services introduced to the user increases, a higher level of e-government security is required. A number of Artificial Intelligence (AI) techniques have been proposed for this purpose. Fuzzy set theory is very useful for evaluation of e-government security (Elssied et al., 2012).

In the form of e-governance initiatives, governments are now trying to use this new potential offered by ICTs and widespread use of the Internet, to improve governance, increase effectiveness, efficiency, reach and to fast-track economic and social progress. It has been widely accepted that the introduction of e-governance and ICT led automation of government departments may lead to organizational changes in the way public services are delivered. Process re-engineering is required at various stages for implementation of e-governance services. However, it has not been proven beyond any reasonable doubt that these technological interventions will lead to institutional transformation. This may be due to the fact that most of the studies focused on the implications of e-governance on service delivery, Implementation of e-
governance in various departments, security aspects, ability to reach a wider audience and digital divide.

Many researches are carried out in different countries and states regarding the effect of ICT and e-governance. Some are related to effect of ICT on education, culture and society; others are related to build better understanding of positive and negative impact of various tools available in the society. Very few researches have been conducted on the security of e-governance. In India access to administration has become difficult task for a common man even for day to day activities like paying bills and taxes. Reasons may be increasing population and decreasing number of employees. E-governance is boon for such a situation. It will help in economic growth by reducing time and costs to get a service. India had understood the potential of e-governance and had started satellite telecommunication experiments. Later on INSAT spurred other ICT technologies (Pardhasaradhi Y., 2009). No studies in recent past have been conducted on secured e-governance in India and with reference to effect of e-governance on the present society. This is the strong reason and motivation to conduct such study.

1.10 Statement and objectives of the study

In this problem certain metrics for websites and web portals have been determined and vulnerabilities of certain portals have been checked to mitigate the risk of security in e-governance. The statement of the problem is here as follows.

“Secured E-Governance in India”

This study or research theme is important because of following reasons.
1) Indian being a second populous country in the world and having a unique place in the ICT sector, it has potential to sort out citizens’ problems with the effective use of ICT.
2) Citizens’ expectations are increasing and are not fulfilled currently and their satisfaction level regarding use of e-services is decreasing.
3) Good governance is also major aim of democratic populous state and that can be achieved using e-governance. As e-governance is easy, effective and economical to implement as shown in Figure 1.7.
4) The main objective of the study is to view vulnerability status and analysis of various websites and portals and derive a set of parameters to ensure that e-governance projects are successful, usable, promote transparency, time effective, affordable and accurate from citizens’ need.

5) Various metrics for accessing e-governance portals and websites of various departments have been taken into account.

6) Increasing rates of ICT adoption by governments and a large number of e-governance projects initiated worldwide led to more research in the e-governance area.

7) This area of study is chosen because of high failure rates (50% partial failure, 35% total failure and 15% success) of e-governance projects and increasing challenges related to implementation in developing countries. There may be various reasons of failure of such projects but security aspect is also one of the reasons. Total failure means project initiative was never implemented or was implemented but immediately abandoned. Partial failure means goals were not attained or there were highly undesirable outcomes. Success means major goals were attained and undesirable outcome were found.
Objectives of the study

Objectives of the study are to

1. Develop certain metrics and apply those for assessment of various websites and portals related with education and other government portals.
2. Study various e-governance systems, vulnerability scanners and their types.
3. Apply designed metrics on certain educational and grievance redress portals.
4. Certain new metrics will be developed and tested for other G2C portals to be taken into consideration as administrative reforms, grievance redress system and their online complaint monitoring system.
5. To stress on the accessibility issues of various e-governance portals in India to popularize them in local folk languages. Such portals can be utilized with the help of mobiles phone and the language for utilizing such portals is native language or not.
6. Certain new metrics for the vulnerability analysis of the web portals and websites will be identified or added.
7. Out of various vulnerability scanning tools available one good will be selected and will be used for measuring of various portals.
8. Various techniques to mitigate the risk and vulnerabilities found on the portals will be suggested.

1.11 Organisation of the study

This study has been organized into seven chapters:

Chapter 2 discusses various e-governance models, frameworks, e-governance in Asian countries along with detailed literature survey on e-governance and its security.

Chapter 3 describes the method adopted for the study. Various terms related with vulnerability and research design process has been explained in the chapter. Various techniques of testing security and vulnerability scanning tools have also been discussed.

Chapter 4 deals with the development of various metrics for the G2C e-governance and grievance redressing portals.

Chapter 5 summarizes results of various studies through various graphical notations.
Chapter 6 explains vulnerability scan thread and various vulnerabilities along with their solutions in details to mitigate the risk because of these vulnerabilities.

Chapter 7 explains conclusion, future scope and limitations of the study.

Summary

In this chapter basic term Information and Communication Technology (ICT) the base of e-governance has been defined. Various projects based on ICT in Haryana and various implications of ICT in India are explained. Various definitions commonly used throughout the study have been explained. After that evolution of e-governance in India, an ambitious e-governance plan namely NeGP has been discussed. Rational behind the study and statement of the problem has been elaborated. E-governance has great potential for citizens in democratic India and can provide various citizen services including election related services at their homes. Chapter concludes with statement objectives highlights of the study.

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