



GLOBAL JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY
Volume 12 Issue 2 Version 1.0 January 2012
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 0975-4172 & Print ISSN: 0975-4350

Importance of Ict and E-Governance Security in Punjab

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Abstract - Information and communications technology or information and communication technology, usually called ICT, is often used as an extended synonym for information technology (IT) allied with the computer and communication resources. It was treated as an electronic technique to storage, retrieval and processing on various types of data. Now IT has moved ahead towards every citizen due to its great usability and much more benefits and it also plays a vital role in e-commerce and e-business, so IT became a necessary part of the life of everybody. With the IT, various types of projects are running to provide the several types of facilities in the every area of all over the world towards the citizens. In recent digital era every Government also wants to maximum use of IT for the development of country. Indian Government also takes IT as very seriously and designs various types of projects to implement at every state level to every urban area as well as rural area. The combination of Government, IT and communication resources a concept came which known as E-governance. The purpose of this paper is to explore E-Governance in Punjab which is the richest state of India. However, it's a typical task to explore integrated E-governance in Punjab, but this paper will try to represent the every aspect of E-governance in Punjab with security point of view. Thus, this paper will discuss from introductory definition of E-governance to implemented key projects under E-governance with security.

Keywords : *IT, e-Governance, Security*

GJCST Classification: *C.2,D.4.6,H.2.7*



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1. INTRODUCTION

Several dimension and related factors influence the definition of e-Governance. The word "electronic" in the term e-Governance implies technology driven governance. E-Governance is the application of Information and communication Technology (ICT) for delivering government Services, exchange of information communication transactions, integration various stand-one systems and services between Government-to-citizens (G2C), Government-to-Business (G2B), Government-to-Government(G2G) as well as back office processes and interactions within the entire government frame work.

According to the World Bank [1]:- "E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens,

businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

Thus, the stress here is on use of information technologies in improving citizen-government interactions, cost-cutting and generation of revenue and transparency.

UNESCO defines e-Governance as [2]:- "Governance refers to the exercise of political, economic and administrative authority in the management of a country's affairs, including citizens' articulation of their interests and exercise of their legal rights and obligations. E-Governance may be understood as the performance of this governance via the electronic medium in order to facilitate an efficient, speedy and transparent process of disseminating information to the public, and other agencies, and for performing government administration activities."

This definition visualizes the use of the electronic medium in the exercise of authority in the management of a country's affairs along with articulation of citizens' interests leading to greater transparency and efficiency.

Dr. APJ Abdul Kalam, former President of India, has visualized e-Governance [3] in the Indian context to mean: "A transparent smart e-Governance with seamless access, secure and authentic flow of information crossing the interdepartmental barrier and providing a fair and unbiased service to the citizen."

E-Governance : "Information and Communication Technology (ICT) that empowers the Government, its citizens including the Government employees, weaker sections, women, people living in far flung and difficult areas and the business houses to transact businesses with government and its agencies online 24/7 "[4]. There are a numerous of definitions for e-Governance. In the framework, E-Governance is defined as a great application of Information Communication and Technology (ICT) to get the better governance and develop a healthy communication

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between the government and various parts of the society.

"E-Governance is defined as the application of electronic means in [5] the interaction between government and citizens and government and businesses, as well as [6] in internal government operations to simplify and improve democratic, government and business aspects of Governance." [5] "Electronic Governance (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 (eAdministration) and delivery of services to the public (eServices). This

generically constitutes electronic government (abbreviated eGovernment);

- 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 eDemocracy); Transacting business with its "supply chain", namely, partners, clients and the markets. This constitutes Government Electronic Business (abbreviated simply eBusiness). [6]

Electronic Governance: *The New Paradigm in Public Sector Reform*

A DEFINITIONAL SCHEMATIC

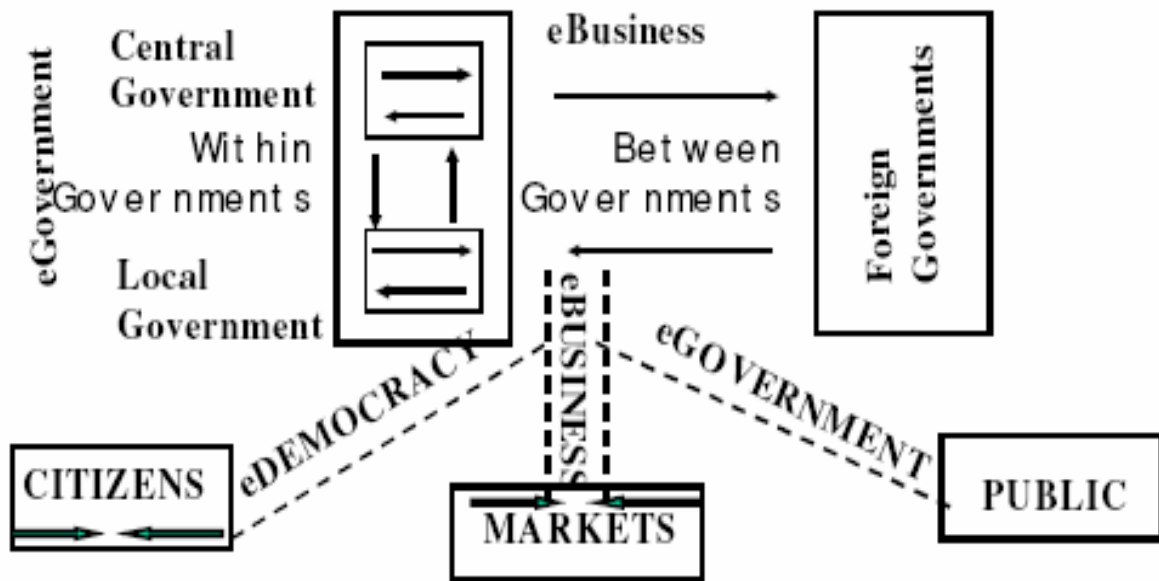


Fig. (a) A Board Definitional Schematic for e-governance [6]

A simpler translated diagram is as follows

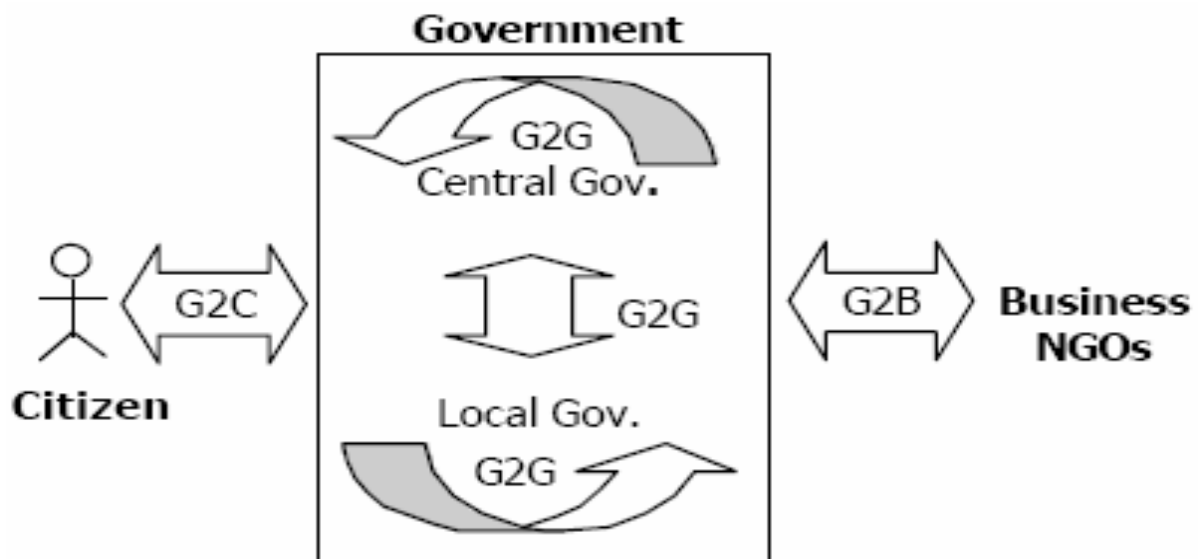


Fig . (b)

It is clearly showing that several benefits of IT which can reach the public at large as the development of e-Government services. The major components for e-Governance project are reengineering government. E-Governance is not just an ICT enabled, efficient and effective public service with enhanced revenue generation for the Government and also not just an application of certain technology but also a way of providing a great citizen services through the use of ICT.

Punjab (Land of five rivers) Punjab is located in the northwest of India surrounded by Pakistan on the west, the Indian states of Jammu and Kashmir on the north, Himachal Pradesh on its northeast and Haryana and Rajasthan to its south. It covers a geographical area of 50,362 sq. km which is 1.54 % of country's total geographical area. Punjab state is located between 29° 30' N to 32° 32' N latitude and between 73° 55' E to 76° 50' E longitude. Its average elevation is 300 m from the sea level. Chandigarh is the capital of the Punjab.

Sikhism is the predominant faith in Punjab. About 60% of the people in the state are Sikhs. The holiest of Sikh shrines, the Sri Harmandir Sahib (or Golden Temple), is in the city of Amritsar. The Sri Akal Takht Sahib which resides within the Golden temple complex is the temporal seat of Sikhs. Of the five Takhts (Temporal Seats of religious authority) of Sikhism, three are in Punjab. These are Sri Akal Takht Sahib, Damdama Sahib and Anandpur Sahib. Anandpur Sahib is where Guru Gobind Singh created the Khalsa in 1699 on the day of Vaisakhi. During major holidays on the Sikh calendar (such as Vaisakhi, Hola Mohalla, Gurpurb and Diwali), many Sikhs gather and march in religious processions through virtually every city, town and village in Punjab.

According to India Today [7], Leading magazine in India, Punjab has been awarded best

overall state since 2003, and has been able to retain the top position every year. It also affords best quality of life to its residents.

Punjab has the best infrastructure in all of India [8]. Although it has a huge shortage of electricity due to high demand, all major cities in Punjab benefit from this and have some of the lowest tariffs in India. All of Punjab's villages have been provided electricity and connected to the state electrical power grid since 1974.

II. VISION OF E-GOVERNANCE IN PUNJAB

In consonance with the national objective of making India a global IT Power and a front runner in the information revolution, the government of Punjab set up the Department of Information Systems and Administrative Reforms (DISAR). The Department of Information Technology (DoIT) has been set up to execute IT policy framework in the state of Punjab. Punjab IT Policy was formulated in 2001 so as to make Punjab a favored industrial destination with a world class infrastructure, to provide citizen-centric governance, and to turn the state into a knowledge society. Punjab was the first state to implement the national e-governance plan under National common services centers (NCSC). The e-governance initiatives of the state focus on creating efficient and cost effective government by improving the internal processes of the government through administrative reforms, process re-engineering, modernization and deployment of IT for an efficient, productive and accountable government. The new Department of Information Technology (DoIT) has been entrusted with the following responsibilities [9].

- To formulate the policy on the use of Information Technology in the State.
- To formulate and implement a plan for introduction

of Information Technology in the Punjab Administration at all levels, in coordination with the concerned Government Departments; and

- To give technical advice to all the Government Departments regarding adoption of suitable information technology systems and for making appropriate arrangements to maintain the same.

Keeping in view the resources constraints, the government considered it a better strategy to prioritize its departments and agencies on rational criteria so as to computerize them in phased manner. Twenty four departments of the State Government had participated in preparation of the Roadmap and they were prioritized into three phases as below:

- **First Phase:** Agriculture, Excise & Taxation, Finance, Health & Family Welfare, Local Government, Revenue, Transport, e-District, Food & Civil Supplies, Secretariat.
- **Second Phase:** Education, Home, Information Technology, Labour & Employment, Rural Development & Panchayats, Irrigation & Power, Public Health, Social & Women Welfare & Welfare of Schedule caste & Backward Classes, Industries.
- **Third Phase :** Co-operation, Information & Publicity, Planning, PWD B & R, Town & Country Planning, Advocate General, Punjab, Animal Husbandry, Chief Architect, Election, Forest, Governor House, Hospitality, legal remembers, Printing and Stationery, Prosecution & Litigation, Punjab Vidhan Sabha, Sainik Welfare, Sports, Technical Education & Industrial Training, Tourism & Culture Affairs.

III. PROJECTS OF E-GOVERNANCE IN PUNJAB

The Department of Information Technology (DoIT) prepares and executes plans in collaboration with the concerned departments to leverage the power of Information & Communication Technology (ICT) as a vehicle for improved governance and service delivery to the citizens in different departments of the State Government [9]

- **Suwidha Integrated Citizen Services:** (Benefits of the project: All the applications pertaining to different jobs of DC office are accepted at Single Window, Delivery time for each and every job is pre-defined, Delivery is made through SUWIDHA counter, Citizen can check the status of application through web site <http://suwidha.nic.in>)
- **Integrated Land Records Management System:** (Benefits of the project: 153 Common service centers are being opened for delivery of services relating to Land Records and Registration of Properties in an integrated manner across the State)
- **Transport Services:** (Benefits of the project: Able to deliver Driving licenses and Vehicle Registration

Certificates in 45 minutes which earlier use to take 10-15 days)

- **Excise & Taxation:** (Benefits of the Project: Better Management of Records, Reduction in Tax evasion, Improvement in delivery of services to the business community through front-end windows, Reduction in defaulter's list, Zero-level in denial transactions from Information Collection Centre (ICCs), Significant plugging of tax evasion / leakage, Empowering all stakeholders through technology, Sole method of retrieving, monitoring, verification of business records and its transaction by the Staff at every level, Eliminating paper administration, Facilitates matching of Returns filled by each dealer with its transactions during a particular period)
- **ICT Education Project:** (Benefits of the project: Providing computer education to 11 lacs student population of Punjab out of total 13.2 lacs students in Government schools. This will give tremendous confidence and competitive advantage to the students of Government schools and especially SC's and poor students to enable them to bridge the digital divide)
- **Treasury & Accounts Management System:** (Benefits of project: Inter Connectivity between Secretariat and Directorate District Treasuries and Directorate and District Treasuries and Sub-Treasuries has been provided by BSNL. The Integrated Treasuries Information System of Punjab (ITISP) has been implemented at Patiala and Ropar Distt. Treasuries and the software has been replicated in all Distt. and Sub Treasuries through which data of all treasuries shall be transferred on Central Server placed at Head Quarter for generating different MIS reports. This would enable to monitor the working of Treasuries and exchange data online from the State Headquarters and vice-versa. It will also facilitate effective control over the expenditure by allocating DDO-wise allocation of budget to the Treasuries, whereby, it will not be possible for DTO to pass bills beyond the authorized appropriation. Any change in budget allocation by the HOD shall have to be intimated to the Directorate of Treasuries and Accounts from where it will pass online to the concerned DTO to enable the)
- **Social Security Management System:** (Benefits of the project: To streamline the functioning of the department, To reduce delays, To bring efficiency in disbursement, To keep proper accounting for audit, To have proper re-conciliation with the banks, To keep track of verifications and re-verifications resulting in savings of funds on account of weeding out the wrong beneficiaries)
- **Punjab Wide Area Network:** (Benefits of the project: Provide reliable, vertical and horizontal connectivity

within the state administration to make the Government more productive. Reduce communication cost. Provide a secure backbone for encouraging electronic transactions. Provide efficient service management Strengthen Disaster Management Capacity. Provide the Government agencies, the ability to leverage a robust infrastructure to provide a complete array of Government services and information. Ensure that every citizen in the state has access to Government services and information whenever and wherever they need it. Make services available in a cost-efficient manner, offering public constituencies' equivalent access at an equivalent price, regardless of their location in the State of Punjab. Move toward the provisioning of converged communication Services (voice, data and video) and the interconnection and interoperation of network platforms.)

- Common Service Centers.
- Agrinet Punjab
- Food & Civil Supplies
- Personal Management System
- e-Procurement
- State Data Centers
- e-District

IV. SECURITY OF E-GOVERNANCE

The information systems give the false impression of being impregnable and secure. This impression is created because, most people are not aware of the limitation of the technology. They believe that machines are more reliable than men as they can not be corrupted. However, the incidents of cyber crimes are increasing with every passing day. The credit card frauds and fake electronic transactions are becoming the order of the day. Most people, who are aware of the cyber frauds, are quite reluctant to use technology if they believe that the IT systems are not secure. Most people are afraid of making e-payments and using credit cards to make payments.

The security of the data and information is extremely important to win the trust of the user. All the benefits of the e-government can be wiped away by a single act of security breach which may corrupt or manipulate all data of the system. It is often impossible to restore the system in the electronic environment as no copies of the original data can be extracted from the system. Therefore, the e-government projects must have highest standards of security and privacy to succeed.

It is important to note that the e-Governance security need is dynamic rather than static and depends on the operational dynamics. Thereby, the process of designing and deploying an information security infrastructure is a continuous and dynamic process.

Often, the change in needs is frequent. In order to be sustainable under such frequent changes, the process has to be developed from a life-cycle approach. This observation leads to the concept of Security Engineering Life-Cycle.

Security Requirement Specification and Risk

Analysis: The first phase in the Security Engineering Life Cycle collects information regarding assets of the organization that needs to be protected, threat perception on those assets, associated access control policies, existing operational infrastructure, connectivity aspects, services required to access the asset and the access control mechanism for the services.

Security Policy Specification: Security Requirement Specification and Risk Analysis Report as input and generates a set of e-Gov security policies. The policy statements are high-level rule-based and generic in nature and thereby, does not provide any insight to system implementation or equipment configuration.

Security Infrastructure Specification: This phase analyses the Security Requirement Specification and the Security Policy Specification to generate a list of security tools that are needed to protect the assets. It also provides views on the location and purpose of the security tools.

Security Infrastructure Implementation: The organization, in this phase, procures, deploys, and configures the selected security infrastructure at the system level.

Security Testing: In this phase, several tests are carried out to test the effectiveness of the security infrastructure, functionality of the access control mechanism, specified operational context, existence of known vulnerabilities in the infrastructure etc.

Requirement Validation: This phase analyses the extent of fulfillment of the security requirements for implementing e-Governance organization by the corresponding security policy and the implemented security infrastructure. Change in the service goal, operational environment, and technological advancement may lead to a fresh set of security requirements and thereby, triggering a new cycle of the Security Engineering Life Cycle.

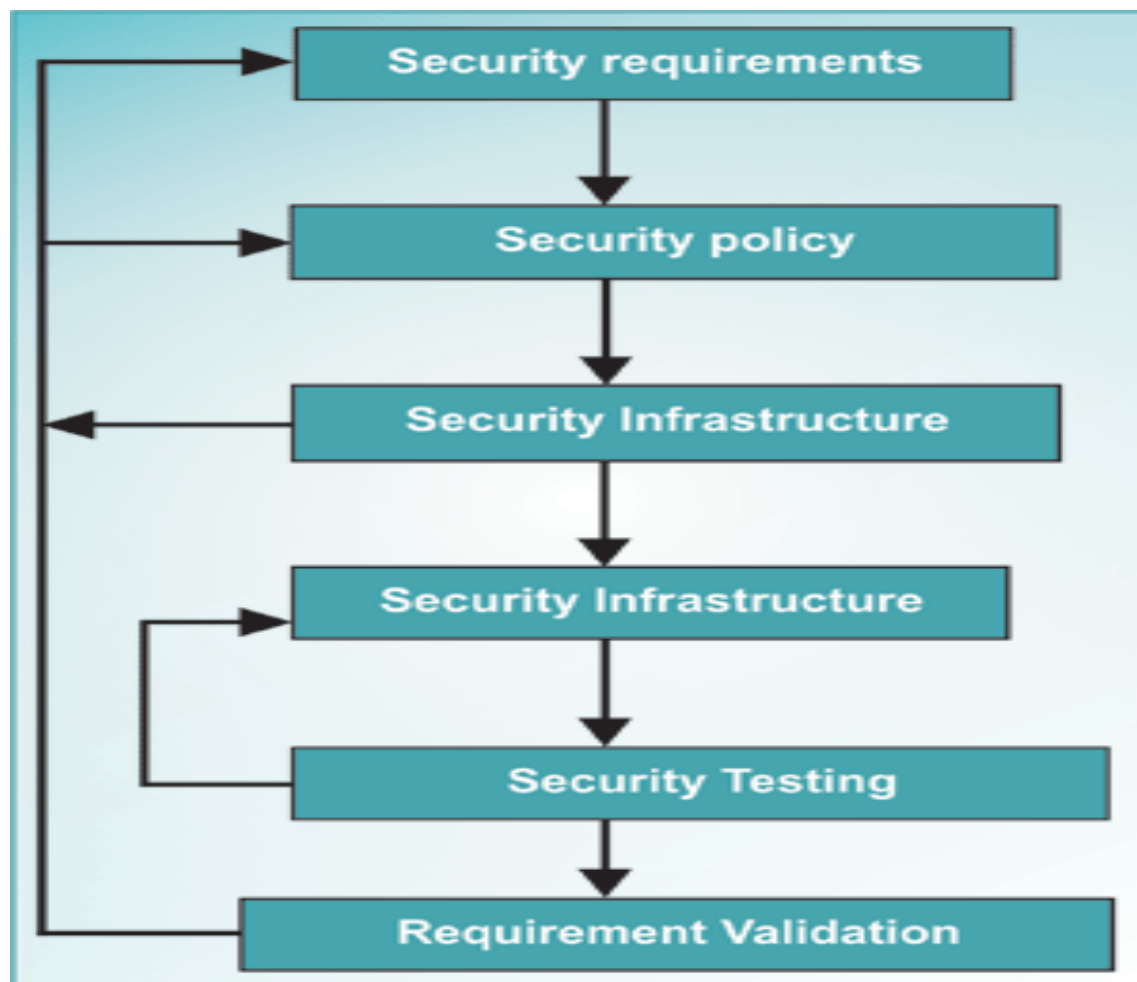


Fig.(c)

V. CONCLUSION

E-governance enhances the relationships between government to government, government to citizens, citizens to government, government to private sector and NGO's to government, using ICT. Thus, e-governance not merely provides information about various activities of a government but also involves citizens to participate in government's decision-making process. During the last few years, many initiatives have been taken by different state governments in India for using Information Technology as a tool in the functioning of government so as to provide better services to citizens. The initiatives of Punjab state are important. E-governance has eventually started to gain popularity in most cities of Punjab.

Many of the citizens of the developing countries like India are illiterate. Also, presently there is lack of inexpensive and easy to use security infrastructure in G2C application. Applications security issues like authenticity, accountability, confidentiality, integrity, non-repudiation, etc need also to be addressed.

Designing and implementing more effective approaches for securing E-government is an important issue, because, the governmental information is usually so sensitive. Security has an important role in trust information of citizens and their adoption of e-Governance. However proper use of e-governance certain points are still to be seen by the state government, which includes:

- Review of the progress of all the ongoing IT projects is must for all time to come.
- Sustainability of already started initiatives is must.
- Compulsory computer education from class 6th to 12th in government schools is required.
- Use of local languages in the IT implementation process. It is essential that local level databases be maintained in Punjabi language.
- Basic computer education should be given for proper use of e-governance in rural area.
- It's important to educate people at all levels about the benefits of e-governance by highlighting as to how it can save their precious time and efforts thereby making the government functioning more transparent. For this purpose, the public libraries

in the state can play a very crucial role. Hence, the state government must take measures to upgrade the public library system in the state.

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