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# An Overview of E-Government

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## Abstract

Recent development in Digital Communication systems, Internet/Intranet technology, and Open-Source software resulted in restructuring of 1st & 2nd generation information systems into cheaper, inter-connectable, and globally accessible user-friendly systems, enabling people to move towards e-government age.

Government is an institution that meets some of society's most critical needs and any/every member of the society sometime or other has to interact with the government.

This paper attempts to give an overview of e-government in general, discussing potentials and barriers involved in realization of it. The much needed Change management or New Public Management for e-governance is also briefly described.

## 1. Introduction

A citizen at some point of time in his lifetime has to interact with the government. Government by its sheer size and quantum of activities not only becomes the only largest source for creation & provision of such information, but also processes the same as a service for its customers.

Government's customer comprises: other government departments, private business organizations, government employees, and ordinary citizens. Complexity in managing the business rises for the government with ever-increasing customer base. This calls for adopting Information and Communication Technology (ICT) for managing its functioning, and thus going digital/electronic.

## 2. ICT

During 1<sup>st</sup> generation of computing, costly Mainframe computers were beyond the buying capacity of many individuals and were only owned by large private enterprises and government [35], [9]. 2<sup>nd</sup> generation Minicomputers and subsequently 3<sup>rd</sup> generation Microcomputers with

Local Area Network (LAN) flourished due to lowering of costs with added connect-ability [35]. The 4<sup>th</sup> generation computing witnessed global proliferation of the Internet and the Web thus providing global connectivity (cross border) and effectively integrating ICT on the basis of open standards [35], [9]. The application development costs further reduced due to free distribution of open-source software's.

### **3. E-Government, E-Commerce, E-governance and Public Administration**

By definition, e-government is simply the use of ICT to improve the process of government [9]. E-government is sometimes defined in a narrow sense as citizen's services, re-engineering with technology, or procurement over the Internet [32].

E-Commerce is marketing and sales via the Internet. Government also engages in marketing and sales, but e-commerce is not the heart of e-government. The core task of government is governance - the job of regulating society and not just marketing and sales [9].

E-governance is defined as the transformation of (governance) processes (resulting from) the continual and exponential introduction into society of more advanced digital technologies [17].

Public administration is the study of public entities and their relationships with each other and with the larger world: [36]

- How public sector organizations are organized and managed.
- How public policy structures the design of government programs that we rely upon.
- How our states, cities, and towns work with the federal government to realize their goals and plan for their futures.
- How our national government creates and changes public policy programs to respond to the needs and interests of our nation.

### **4. Players of E-Government and their expectations**

Individuals and organizations interacting directly or indirectly with the government are known as the players of e-government. The interactions can be named as Government-to-Government (*G2G*), Government-to-Business (*G2B*), Government-to-Employee (*G2E*), and Government-to-Citizen (*G2C*).

Responsible persons of the government carry out all the above transactions, and moreover all the players apart from being aware of their transaction status, stress more on quick and error-free transactions.

E-government promises to make government more *efficient, responsive, transparent* and *legitimate* [9].

## 5. Democracy and E-Government

*Democracy* has been seen as most widely practiced form of governance. In a democratic nation, all citizens are treated equally and every citizen is identified independent of race, language, and gender. The legitimacy of democracy is philosophically based on ethics and morality. This is reflected by freedom of speech, right to vote, free and fair elections, protection of religion/social/cultural minorities, etc.

E-Governance focuses on how ICT technologies can be used to strengthen the public's voice as a force to reshape the democratic processes, and refocus the management structure, and oversight of government to better serve the public interest [17].

In modern democracies, responsibility and power for regulation is divided and shared among the *legislative*, *executive*, and *judicial* branches of government.

- Legislature - responsible for making policy in the form of laws.
- Executive - for implementing the policy and law enforcement.
- Judiciary - for resolving legal conflicts.

So, E-Government is about improving all these branches of government and not just public administration in the narrow sense [9].

E-Government is not a mere technological infrastructure or strategy but rather a new integrated style of Public Administration organization and operations [10].

## 6. Pillars of E-government

The basic structure of e-government is constructed around the following four pillars:

- 1) *Leadership/Vision*: There should be long-term vision and committed leadership among the top-notch political and administrative sections of the government. This is more concerned with the *legislative* branch of the government.
- 2) *Governance/Administration*: The responsibility of meticulous planning now lies with the 2nd level bureaucracy and other public service framework. Clear-cut policy statements should be stated and enforced e.g.: coming out with an ordinance for e-transaction. If required, provisions should be made for reviewing the architecture of government system i.e. New Public Management (NPM). This is concerned with legislative and judicial branches of the government.
- 3) *Integration/Collaboration*: In view of providing reasonable quality of service at affordable costs, it is necessary to hunt for best practices. To efficiently/effectively meet the needs; e-governance fosters partnerships and collaborations of those who have a stake in enriching the processes. This includes all level of government, private

sector, the academic community and foundations [17]. This is more concerned with the *executive* branch of the government.

- 4) *Technology and Infrastructure*: Re-engineering and deployment of governance processes via advanced Internet technologies is an evolutionary process of structural and functional adaptation [17]. Public information, services, programs and goods can become accessible to anyone, anywhere and at anytime over the Web [17]. E.g.: Public Key Infrastructure (PKI), IT security, etc. All this calls for right infrastructure and implementation program with clear accountability for outcomes. This is concerned with *legislative and judicial* branches of the government.

## 7. New Public Management (NPM)

Public institutions were set-up by governments with the sole intention of serving the public. However, traditionally the approach adopted by public administrative personnels was more of processing the information for its customer rather than involving or considering their views in the entire processing/decision making process. The citizen's views subsequently could be culminated into more efficient, effective, and economic business process, thereby guaranteeing quality of service and customer satisfaction.

The drawbacks in traditional practice of public administration was mainly due to deep hierarchical organization structure, bureaucracy complexity among the departments, excessive and time consuming duplication/multiplication of paper work, protective job market, etc which lead to endless wait of time for the customers.

The need for providing better public service was more widely acknowledged as early as 1992, when Osborne and Gaebler [20] published their book titled "Reinventing Government". In an attempt to bring reforms in public management, they described 10 principles around which entrepreneurial public organizations should be built.

On public management reform and e-government Jones [11] has compiled views of several academicians around the world in the field of public administration and political science. The dialogues include - difference of opinion on the definition of NPM, need of NPM, impact of NPM, future of NPM, and hiccups in implementation of NPM.

McLaren [16] emphasizes towards contributing more that what is defined by NPM under the heading of "Service to the customer", stressing more on developing the customer rather than just providing the basic service.

New Public Management is a kind of management theory about how to reform government by replacing rigid hierarchical organizational structures with more dynamic networks of small organizational units; replacing authoritarian, top-down decision and policy making practices with a more consensual, bottom-up approach which facilitates the participation of as many stakeholders as possible, especially ordinary citizens; adopting a more 'customer'-oriented attitude to public services; and applying market principles to enhance efficiency and productivity [9].

## 8. From Government to E-Government

It is impossible to expect overnight transformation of traditional/conventional government into e-government due to its massive size along with complex set of policies, processes, work culture, etc. Moreover, adoption of NPM and ICT demands time and training for one and all.

The United Nations Online Network in Public Administration and Finance (UNPAN) [33] outlines five stages of E-government development:

- 1) *Emerging* web presence – static online information about public services, contact persons, working hours, contact details, frequently asked questions, etc.
- 2) *Enhanced* web presence – access to updated information, links to various connected organizations, availability of newsletters, posting of comments, etc.
- 3) *Interactive* web presence – downloading of forms, submission of online applications, secured access for searching database, etc.
- 4) *Transactional* web presence – secured two-way transaction, use of authentic digital signatures, one-stop portals at local/regional level for tax payment, obtaining birth/death certificates, etc.
- 5) *Seamless or Fully integrated* web presence – universal portals connected to each and every department of government nationally/globally, etc.

## 9. Potentials of E-Government

The full potential of transforming the public administration is not yet fully known. However it involves [32]:

- Making information and services widely available to the citizens
- Reducing digital divide by providing equal access to information.
- Empowering citizens by interacting with them i.e. two-way communication.
- Creating and linking local and global online communities.
- Encouraging innovative styles of leadership.
- Business of public sector at reduced transaction costs.

## 10. Barriers of E-Government

While transforming conventional service-delivery government into digital (e-government), potential barriers faced are grouped under five dimensions:

- 1) *Organizational*: personnel's at different levels and in different departments need to interact collectively in the true spirit of teamwork for running the show. It is highly

essential to adopt change in work culture/attitude due to influx of ICT and NPM. If required necessary training/skill should be imparted to the working personnel's.

- 2) *Socio-economic*: necessary funds to be provided for - integrating the existing services, deployment of user interfaces, and extending the services to its maximum reach. Special care to be taken against social exclusion and efforts to be put up for reducing digital divide.
- 3) *Democratic*: there should be consensus among the political parties to go for a longtime planning of reforms, which should essentially not be discontinued incase of change of leadership/power.
- 4) *Legal*: the executive and the judiciary sections should come out with evolutionary measures in support of public reforms. This would essentially mean implementation with legal support for new policies.
- 5) *Technological*: with all the technology now available, it finds very less importance. Except in cases such as use of digital signatures, data privacy, secured e-transaction, etc. Working on open standards and free source software will definitely help in integration of application and lower application development costs respectively.

## 11. Applications of E-Government

The most common applications of E-government services include those for [32]:

- Online public services delivery including transaction services (e-portals) e.g. certificates application, tax payment, etc.
- Tele-consulting e.g. e-assistance
- Tele-voting e.g. e-voting
- E-forums e.g. message boards
- Online opinion polls, job vacancies.
- Online statistical data, GIS traffic information.
- ICT support for voluntary work and charities e.g. online communities
- ICT in police and courts and ICT in policy making.

## 12. Some Efforts towards Implementations of E-Government

**New Public Management (NPM):** Any administrative reform deals with relationship between state and society or between public sector and citizens. Nikos [18] discusses about the new paradigm of administrative reforms in Europe wherein, resemblance of different administrative systems provides an opportunity for convergence.

Jones and Mussari [11] have put efforts to improve management control systems and processes- including budgeting, accounting, and reporting, within the context of a responsibility framework in the United States and Italy.

**e-Planning:** The UK government has taken steps to go-ahead with their e-commerce policy [28]. In this process the British Telecom came out with providing cheaper rates for Internet calls. To boost digital economy, the government planned to help at least 100,000 low-income families by providing computers on lease.

The Russian government approved 2.6 billion US dollar program “Electronic Russia 2002-2010” to boost e-commerce and Internet use in its country [7]. The E-Russia is planned for delivering government services online by reducing bureaucracy on its citizens and businesses. This 9-year plan addresses four key areas: Regulatory and legal environment, Internet infrastructure, E-Government, and E-Education.

The e-Europe 2005 action plan is based on two groups of actions that reinforce each other [5]. On one hand it aims to encourage services, applications and content, covering both online public services and e-business; on the other hand it addresses the underlying broadband infrastructure and security matters.

The Web-based Survey on Electronic Public Services is part of the eEurope program [8]; this measurement of progress executed by *Cap Gemini Ernst & Young*, benchmarks 25 basic services in the 15 EU Member States, plus Iceland, Norway, and Switzerland.

The Italian government on bringing reforms in public administration bases its strategic reference model on e-government composed of 6 key elements: *service provision, digital identification, access channels, service provision agencies, inter-operability and cooperation, and communications infrastructure* [6]. The government formulated its policy in its 13<sup>th</sup> legislature and came out with its e-government action plan.

**Public-Private Collaboration:** Continuing further on the lines of NPM and Policy-making, Lawrence and Abramson [13] narrate how they successfully created a Northern Virginia Regional Partnership (public-private partnership) to overcome regional shortage of technological workers.

Outstanding leaders Potts [23] and Augustine [1] in an interview present their views on ethics in public and private sector respectively.

Professors in Public Affairs (Arizona State University) Denhardt and Denhardt [4] presented a report on creating a *Culture of Innovation* based on their experience in the City of Phoenix (USA), which in the year 2000 was named as one of the two best run city governments in the world. The report describes 10 key lessons, which can be applied to all public/private organizations.

Shortage of specialized skills and expertise in public sector undoubtedly calls for partnership with private companies. British Telecom, UK [27] very briefly describes the possibility of public-private partner and the stakes involved.

**Information and Communication Technology:** Perkins [22] describes how Hampshire County Library launched UK’s first Wireless Application Protocol (WAP) enabled local

authority web site. The site was developed using Nokia mobile company's WAP toolkit and was written using Wireless Markup Language (WML). The site can be accessed using any WAP enabled device

Robb [25] writes on developing Public Key Infrastructure (PKI) for cross-certification agreement between Federal Bridge Certification (FBCA) and State of Illinois. Apart from FBCA other PKI/security vendors such as RSA, Cylink, Verisign, and SpyruS also coordinated in the project. Instead of relying on passwords and PINs, PKI was adopted for secured electronic transactions.

**e-Learning:** Laurillard, a professor in an open university at UK [30] calls for rethinking on the way to work and study for online learning programs. They should look more professional and interactive. The Metadata for Education Group (MEG) is developing recommendations for standards, by examining the best practices in the UK and around the World.

The Local Government and Development Agency (IDeA) [31] created an online pool of training materials for its staff. This project is divided into three broad areas: consultancy, knowledge and learning, and e-government. This system has been developed in partnership with e-learning specialists *Epic Group* of UK.

**e-Forums:** In the city of Esslingen in Germany [32], internet-based citizen participation was carried out as an informal discussion for planning projects on development of neighborhood. The citizens expressed their views on favoring and against the development project. The tasks of the moderators were not limited to preventing offensive contributions or reminding participants to stay on topic.

DEMOS [24], an European Commission funded E-democracy R&D project offers Internet services for forming public opinion. The democratic discussions include political issues at the local, national, and European level. The DEMOS system is jointly designed by AiS and FOKUS institutes of Fraunhofer, Germany and uses Zeno, an Open Source Internet groupware system written in Java.

**e-Portals (one-stop government):** E-Portals are small steps towards E-Administration. Almost most of the public services start their e-government programs by implementing one-stop government. E-Portals allows citizens 24 hours access through all 7 days of the week from anywhere using the Internet.

Since 1998 the town administrations (comuni) in Italy were given full responsibility of all administrative actions concerning business activities of private and public companies operating in their municipality [26]. Activities included issuing/renewing of licenses for starting any activity, building of new plants and deciding their locations, etc. In the town administration of Bologna all services were integrated to provide a single window access. Along with the town administration (comune di Bologna) and Central government, the project also included local administrations (Regione Emilia Romagna and Provincia di Bologna), as well as the Health Care Service and the Social Security Service. Regional Agency for Environmental Care (ARPA) and the Fire Brigade also contributed to the project. Electronic kiosks and Window with tellers were provided for the users to access the portal.



eGov [37] an EC-funded project that aims at developing an integrated platform for realizing one-stop government. This consortium consists of 10 partners coming from Austria, Finland, Germany, Greece, and Switzerland. These partners consists of public and private research institutions, local and global public administrations, and technology providers. The Portal would be WAP enabled with a Government Mark-up Language (an XML derivative), based on open standards for information and data exchange. eGOV provides flexible access, for everybody, from anywhere, and at anytime.

**e-jobs:** Jobsgopublic.com [34] is the only UK jobsite dedicated to public sector careers across the UK. Opportunities in e-Government can also be found.

**e-Healthcare:** Since 1996, a Healthcare Domain Reference Data Model (HRDM) is being developed in Crete by ICS-FORTH, Center for Medical Informatics and Health Telematics Applications, Germany [15]. The idea is to integrate geographically distributed heterogeneous autonomous healthcare information systems. HRDM entities include record of patients, doctors, medical resources (e.g.: hospitals, ambulances, kits & equipments), prescription & diagnostic details of patient, etc.

UK's National Health Service (NHS) on its strategy 'Information for health', in view of modernizing itself, adopted Telemedicine – the use of technology to enable health care to take place at a distance [29]. NHS hoped to deliver quicker, cheaper, and more relevant data to clinical staff. Encouraging telemedicine, Data links were setup between accidents & emergency departments of Glasgow and Turo hospitals and Scottish and Cornish island communities. Professor Carl May of University of Newcastle believes that there is no basis for expecting cost-savings from telemedicine.

**e-Voting:** The year 2000 US presidential election was a wakeup call for election officials as it exposed the frailties of American balloting system. Patterson [21] cites example of *election.com* in Arizona, which witnessed more than double of previous citizen participation. Though e-voting in futuristic sense would mean use of computers and Internet, many touch screen voting systems are available which ensures - security, authenticity, preserves voters identity, assists in counting & re-counting, and also provides access to the disabled.

On October 6, 2002, electronic voting machines were used for the first round of Brazil's presidential elections [14]. Over 115 million voters used these flawlessly functioning voting machines, which were designed and built in Brazil. In this same week Brazil signed an agreement with the United Nations to share its electronic voting technology with member nations.

**e-Democracy:** Digital democracy is the future vision of e-government. E-Democracy stretches across the entire democratic process. The E-Democracy spectrum ranges from voter registration, voting, public opinion polling, communication among elected representatives and their constituencies, universal access to technology, wired legislative bodies, and legislative processes that encourage greater citizen participation [32].

Clift [2] while coordinating with the State of Minnesota's online efforts, drafted top ten e-Democracy "TO DO List" for Governments around the world.

Clift [3] focusing specifically element of e-democracy governance and representative governance in the information age, reports on progress made by Australia and New Zealand

towards e-democracy. Both the countries gathered innovative ideas and applications around the world and adapted them to suit their culture. The study includes policy development and political leadership, enhanced information access and e-mail notification, representative strategies in parliaments and local councils, and online consultation and communities of practice.

### 13. Conclusion

In 1998 US vice president Al Gore stated on Partnership for Reinventing Government (Virtual Government), "In the long run, we have to build agencies...that work more on horizontal than vertical lines. Partnerships and fluid organizations are the key, because networks-not hierarchies-define government in the 21st century."

To create a government that works better and costs less, the public service should be modeled on standards such as courtesy, timeliness, clarity, and accuracy of information, all this with a remarkable amount of professionalism. This in turn offers improved business result, customer satisfaction, and employee satisfaction.

E-Government is a strategy and an element in modernizing government wherein the NPM paradigm is replacing the traditional model of public administration. NPM believes that citizen involvement not only helps with implementation, but also makes programs better.

If the Internet is about anything it's about interactivity. E-Government must find and fund ways to use technology to deliver a meaningful dialogue between government and citizen. And that means equal participation, not just one way electronic barrage of information.

The challenge is to focus less on the tools and techniques and more on developing this new E-government for serving our citizens better than its paper-based forerunner.

The genesis of 21st century digital government is intelligent planning, collaboration and cooperation among decision makers at the federal, state and local levels. To the citizens it should be one government; they shouldn't have to navigate between multiple jurisdictions.

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