E-governance of Bangladesh: Present Scenario, Expectation, Ultimate Target and Recommendation

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Abstract— E-governance has been recognize as an integrated system of radical change and strategic tools that supports and simplifies governance to improve some criteria like easy access to information, participation of citizens, efficiency, prompt service delivery, reduce corruption, transference and accountability to reform and provide dynamism in the public sector. Similarly improve the communication with the others government organizations, business organization as well as public.
The aim of the paper to study and analyzes the current status of emerging electronic and web based governance (e-governance) in Bangladesh. The evaluation of e-governance conducted through this study. Theoretically the paper considers some criteria of e-governance to know the state of governance and development of the country. Similarly it examines the dynamics, challenges, drawbacks and recommendation of e-governance in Bangladesh. It is shown that e-governance can add tremendous dynamism in reforming public administration and can change the mode of interaction between the state organizations, business organizations and citizens. It also suggests easy access, increase transference, accountability; reduce corruption and participation of citizens. The paper tried to identify the advance organizations and leg behind organizations in respect of e-governance. Several studies have discussed how e-government will transform public sector organizations from traditional paper-based systems to electronic delivery system to lead self-service operations that develop efficiency, accountability and reduce corruption. Some tools of e-governance are using different organization randomly but it should be systematic and concentrated way.
Index Terms— E-governance, E-government, Public Sector Organizations, Traditional paper-based System, Integrated system, Enterprise architecture of e-governance, IT Infrastructure.

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1. INTRODUCTION

1.1 Background

E-governance is an arrangement of selected tools and techniques used to increase effectiveness and efficiency of public administration by using Information and Communication Technology (ICT). It is a massive change from the previous manual and paper based slow public administration procedure to faster effective and paperless system. It is not one time job rather step by step procedure of pre-planned framework with proper central guideline. This change is tougher and hurdle job because it needs attitude change and technological change. Especially it is very tough when there is no accountability and transparency. All required e-governance tools are not available and which are available sometimes it is not properly used.

E-Governance or 'electronic governance' is basically the application of Information and Communication Technology to the processes of Government functioning in order to bring about 'Simple, Moral, Accountable, Responsive and Transparent' (SMART) governance. This would generally involve the use of ICTs by government agencies for any or all of the following reasons: (a) Exchange of information with citizens, business and non-government organization or other government departments (b) Speedier and more efficient delivery of public services (c) Improving internal efficiency (d) Reducing costs/increasing revenue (e) Re-structuring of administrative processes (f) Improving quality and accurateness of services. [2]

E-government is a radical change and strategic tool that supports and simplifies governance for parties, government, citizens and businesses (Gupta and Jana 2003; Evans, 2003; Basu 2004). Its benefits can be divided into two broad aspects, specifically the transformation of government operations and the transformation of governance positively affecting the relationship between citizens, businesses and governments through improving the interactivity between these parties and making it smoother, faster and more responsive (Moon 2002; Altallab 2001, cited in Al-Sebie *et al.* 2005). [37]

These far-reaching developments in e-government have encouraged governments around the world to establish an on-line presence by publishing statistical information on the Internet. In so doing, they hope to increase efficiency, effectiveness and organizational performance. Countries, irrespective of their developing characteristics, are constantly striving to improve the efficiency and effectiveness of e-government delivery services. They hope that e-government will emerge as a magical antidote to combat corruption, red tape, bureaucratic inefficiency and ineffectiveness, nepotism, cronyism, lack of accountability, and transparency. [3]

Overall performance improvement is necessary in the government sector of Bangladesh and all are interested in the e-government system to use and utilize electronics service delivery, citizen's direct participation as well as reduce fragmentation and complexity of the government system. Use of e-governance system by public administration would resolve the obstacles and barriers of the old manual system. As a result e-governance implementation

would generate more benefits including increasing transparency and accountability, reduce corruption, efficient and prompt service delivery, wider participation and deeper involvement of citizens, institutions, civil society groups and the private sector in the decision making process of governance.

In response to this transition in the context of governance, in almost every country, the state has taken the necessary initiatives to restructure political and administrative institutions by adopting ICT in order to enhance electronic interaction and service delivery (Menzel, 1998; Galbi, 2001). Today public servants are encouraged and trained to be familiar with the tools and languages of ICT (Menzel, 1998). In fact, there have emerged many buzzwords — including digital governance, smart governance, net-governance, cyber-management and digital democracy — which overlap with the notion of electronic governance or e-governance (MIT, 2001b). [6]

ICT offers three information processes to promote governance: [3]

--Automation: replacing current human-executed processes, which involve accepting, storing, processing, outputting or transmitting information (i.e., the automation of existing clerical or managerial functions of the different offices).

--Normalization: supporting current human-executed information processes, namely supporting current processes of decision-making, communication, and decision implementation.

---Transformation: creating new ICT-executed information processes or supporting new human-executed information processes. For example, create new method /system of public service delivery.

In brief, e-Governance as a vehicle to initiate and sustain reforms by focusing on three broad areas [24]:

Governance

- Transparency
- People's participation
- Promotion of a democratic society

Public services

- Efficient, cost-effective and responsive governance
- Convenient services to citizens and businesses
- Greater citizen access to public information
- Accountability in delivery of services to citizens

Management

- Simplicity, efficiency and accountability
- Managing voluminous information and data effectively

• Information services

• Swift and secure communication

In the age of the information and communication technology (ICT) e-governance may use to make life easy by providing proper support using intelligence, speed and effective application of ICT. It is necessary to make government more responsive, prompt and to make more sustainable future for the benefit of the whole society and world. This study shows necessary environment of e-governance, existing tools and tools requirement of e-governance in Bangladesh. This report paper shows some guidelines of future research to further improvement of e-governance in Bangladesh.

1.2 Statement of the problem

Sometimes it is essential to identify a citizen who is he or she. But in Bangladesh it is not easy. You need a passport that is dependant on police verification. You need a bank account/loan or driving license or government job or government benefit but you have to show national certificate or commissioner certificate. Sometimes it may be false. Similarly some criminal are identified by face but not identified who is he and where he is living. However this system just started by Voter ID and working in the initial level.

Someone has submitted his educational certificate for job, further education and related other purpose. Verify this certificate is very tough job and time consuming. Sometimes false certificate is provided for various purposes.

Someone needs very simple information. He has to go to the related office which may be in the other district. He has to identify who is responsible for that information. Responsible person have to find out this information from a lot of documents manually. Sometimes it is very difficult to identify who is responsible for particular job and who is working in the position.

Government follows bottom up hierarchy. You can not reach higher officer though it is essential and even when your valid job is refused from lower stage. About all offices of the government sector using manual register system to track a file and their activities. It is very tough to identify a file movement that was submitted one month ago or more.

To move a file from a table to another table need 2 to 4 weeks sometimes it takes months. Sometimes junior officer is not forwarding a file to proper place in proper time. Sometimes file will not move without benefit of middleman. Sometimes manual system is also responsible for some corruption.

Land disputes lead to many criminal offences in Bangladesh. The land ownership system is very complex in Bangladesh. One land selling several time to several people. Land registration is very tough job and perplexing. It is related with several previous records and previous owner of the land. In the manual system maintain previous record very tough and as a result registration become false. Similarly lots of government owned land is grabbed by powerful people and ultimately registered by their own name. Automation land system is much more necessary.

So e-governance will provide information and services from a center point within a very short time. One department will share information with other department easily. Information cross check will be much more easy and provided service will be prompt. File movement will be supervised by higher officer easily that will make activity fast.

1.3 Rationale of the Study

Project report writing job is a process of learning and good combination of theoretical and practical reality of the particular subject. If someone like to write something about a topics or subject he has to gain enough practical and theoretical knowledge of that subject. Project work helps us to learn how to apply knowledge and to address practical problem of the real working scenario?

Preliminary stage of e-governance culture just started in the Bangladesh. I think, it is necessary to know and realize what the actual procedure is? It is essential to identify the proper steps or e-government tolls that are required to implement e-governance. What will be the ultimate target or output of e-governance? Time to time these should be evaluated and necessary measured how much we have proceeded? There should have real statistics of e-governance of the country to identify the lack and progress. So it is much more necessary to study e-governance in respect of Bangladesh.

1.4   Objectives of the Study
The objectives of the analysis to:

1. Study the present scenario of the government in respect of e-governance.

2. Introduce the steps to implement e-governance or to create environment.

3. Identify the advance and leg behind organizations in respect of e-governance. According to that they should be encouraged and take measured to advance respectively.

4. Identify the level of advancement and how should it be accelerated if necessary.

5. Determine steps to achieve the goal and measure their acceptability.

6. Identify is the standard level of expectation they are trying to fill up.

7. Identify a supervisory authority or central committee who will centrally maintain standard rules for total infrastructure.

8. Determine the benefits which general people getting or expected in the future.

9. Determine are the major obstacles and methods for resolving the issues.

10. Identify the government external and internal obstacles clearly.

2. RESEARCH METHODOLGY AND DATA COLLECTION

2.1 Research Perspective

There are two main approaches to prefer from when conduct a scientific research: quantitative and qualitative approach (Yin, R. K. 1994). A quantitative research approach gives an analytical perspective with formalized and structured data, which is used for statistical analysis (Holmes, I.M. & Solvang, B.K. 1996). According to Maykut & Morehouse (1994) "quantitative research is based on observations that are converted into discrete units that can be compared to other units by using statistical analysis". So in this research, statistical analysis is an essential part.

The methodological choices in this research have been made with a view to gaining an understanding of how e-government is interpreted by those with responsibility for its implementation, and thereby to gain some insight into the likely transformative effects on public governance that may accrue as a consequence. A qualitative approach to data gathering (s3.3) has been adopted that is consistent with the philosophical position of 'social reality' (Berger & Luckman: 1966). This approach emphasizes understanding complex, interrelated, or changing phenomenon and deals with it by taking account of the context within which it occurs (Morgan: 1997; Mittman: 2001; Patton: 2002; Yin: 2003).

Survey conducted mainly on the Ministries of Bangladesh because Ministry is the top position of the organization hierarchy of government. E-government environment should be started from the top and it would be very easy to implement to lower hierarchical organization like division and department. Survey conducted on the basis of some e-government tools like PC uses, LAN, Internet usage, existence of official email and usage of this email, secure ID, web site and status of regular update, share printer, IT documentation, Data center and data backup, core database application, IT manpower and network security.

2.2 Data Collection

I used qualitative and quantitative data from both primary and secondary sources in this research. The primary data came from a series of structured interviews conducted with government IT officials engaged in IT section or providing IT related solutions and services to the citizens. A total of 50 ministries selected for interview and conducted in the Bangladesh secretariat during January 2012 to April 2012. All interviews with government officials were conducted face-to-face and fill up Questionnaires according to their input. The secondary sources of data collected from official documents published by governments and their agencies regarding their e-governance policies and projects, published studies and scholarly research done on different IT and e-governance related project, reports and analyses published by universities, consulting firms, newspapers, magazines, and so forth. Some study going on but not indicating root cause of failure or lack of full fill target. Some study is available from government project where they indicated their

own improvement regardless overall country improvement.. Secondary data has collected from journal, different project paper, department statistics and improvement history. Primary data collect by own investigation and survey.

2.3 Data processing and analysis

Data processing and analysis is a vigorous job and it is related with meaning of the collected data of the research. Survey data is arranged in a table and make percentage of the individual tools of e-governance and shown individual tool performance of the surveyed organizations. It is also shown in the graph.

Microsoft office application (like Word, Excel), Adobe Acrobat professional, Photoshop, Scientific calculator used to calculate and presentation of data in the tabular and graphical form. Statistical software and tools has used to process and analyze data for compare the relationship of data.

3. LITERATURE REVIEW OF E-GOVERNANCE

3.1 Defining e-Governance:
There is no standard definition of this term. Different institute, governments and non-government organizations define this term according to their own aims and objectives. Sometimes, the term 'e-government' is also used instead of 'e-Governance'. Some widely used definitions are listed below:

I. According to the World Bank:

"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.

II. UNESCO defines e-Governance as:

"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.

III. Europe has taken e-Governance to mean:

"The use of electronic technologies in three areas of public action:

- Relations between the public authorities and civil society

- functioning of the public authorities at all stages of the democratic process (electronic democracy)

- the provision of public services (electronic public services)"

In this case, the focus is on making use of electronic technologies with a view to encourage better interaction between government and citizens, promote democracy and provide public services.

IV. The US E-Government Act of 2002 defines "electronic Government" to mean   (Section 3601):

"The use by the Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies, to-

(A) Enhance the access to and delivery of Government information and services to the public, other agencies, and other Government entities; or

(B) Bring about improvements in Government operations that may include effectiveness, efficiency, service quality, or transformation".

This definition reflects the strategy of the US Government regarding the use of ICT in improving Government operations on the one hand and enhancing the access and delivery of information and services to citizens and government entities on the other.

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

VI. E-government refers to the use by government agencies of information and communication technologies (ICT) that have the ability to transform relations with citizens, businesses, government employees, and other arms of government in the delivery of services. For the World Bank, it is the use of ICT to improve the efficiency, effectiveness, transparency, and accountability of government.

E-governance is a scenario where the Government of a country, citizens, business organization and all other related organization should be able to perform their all related activities or Majority of activities with a very low effort, low cost and less time consumed by using an electronic means. That is Government organizations providing and sharing services where people are taking services. These give and take transactions should be accomplished properly and promptly. To create those kinds of environment a country need properly planned infrastructure and to encouraged people to use this system. People may be divided into two categories. One part public sector people mainly those who will provide services and other part mainly those who will receive services like other government sector, business organization and general people.

3.2 Primary Stages of e-Governance

E-Governance is intrinsically linked with the development of computer technology, networking of computers and communication systems. In developing countries, such technologies and systems became available with a perceptible time lag as compared to developed nations. Bangladesh just started in the initial level of e-governance. Generally e-Governance proceeded through the following phases for initial development.

(a) Infrastructure Development:

(i) Computerization: In the first phase, availability of personal computers, other essential IT- equipment and system software to all the functionaries that is a large number of Government offices got equipped with computers. The use of computers began with word, Excel, power point and quickly followed by data processing.

(ii) Networking: In this phase, Establish and maintain the Local Area Network (LAN) and WAN where necessary. Units of government organizations got connected to sharing of information and flow of data between different government entities.

(b) Automation/ Application Development: Every office should develop a central application or applications that will cover automation about all major function of the office. Implement various applications that not only maintain records of receipt, issue of letters and movement of files but also offer enhancement in accountability, responsiveness and transparency in governance.

(c) e-Reports: Convert the Acts, Rules, Circulars and other published materials of interest or relevance to the public, in the electronic form. Convert all old documents and hard copy to electronics form to transfer and communicate easily.

(d) IT Training: As a human being we don't like to go through a technological changing or new environment especially where we are not habituated. To be user friendly and habituated we need training and go step by step. Provide relevant training courses to the officers/ staff that enable them to work on computers by using various applications.

(e) On-line presence: This resulted in maintenance of website by government departments and other entities. Generally, these web-pages/web-sites contained information about the organizational structure, contact details, reports and publications, objectives and vision statements of the respective government entities.

3.3 Final Stages of e-Governance

Gartner's e-governance model where e-governance can be matured through the following four phases: The four phases are

1. **Information – Presence:** e-governance means being present on the web, providing the public (G2C & G2B) relevant information. The format of the early government websites is similar to that of a brochure or leaflet. That is government information is publicly accessible; processes are described and become more transparent, which improves democracy and service. Internally (G2G) the government can also disseminate static information by electronic means, such as email and Internet.

2. **Interaction – Intake processes:** the interaction between government and the public (G2C & G2B) is stimulated with various applications. People can ask questions via e-mail, use search engines, and download forms and documents. These save time. In fact the complete intake of (simple) applications can be done online 24 hours per day. Normally this would only have been possible at a counter during opening hours. Internally (G2G) government organizations use LANs, intranets and e-mail to communicate and exchange data.

3. **Transaction – Complete transactions:** the complexity of the technology is increasing, but customer (G2C & G2B) value is also higher. Complete transactions can be done without going to an office. Examples of online services are filing income tax, filing property tax, extending/renewal of licenses, visa and passports and online voting. Phase three is made complex because of security and personalization issues. E.g. digital (electronic) signatures will be necessary to enable legal transfer of services. On the business side, the government is starting with e-procurement applications. In this phase, internal (G2G) processes have to be redesigned to provide good service. Government needs new laws and legislation to enable paperless transactions.

4. **Transformation – Integration and exchange:** when all information systems are integrated and the public can get G2C & G2B services at one (virtual) counter. One single point of contact for all services is the ultimate goal. The complex aspect in reaching this goal is mainly on the internal side, e.g. the necessity to drastically change culture, processes and responsibilities within the government institution (G2G). Government employees in different departments have to work together in a smooth and seamless way. In this phase cost savings, efficiency and customer satisfaction are reaching highest possible levels.

3.4 Types of Interactions in e-Governance

E-Governance facilitates interaction between different stake holders in governance. These interactions may be described as follows:

G2G (Government to Government) – In this case, Information and Technology is used not only to restructure the governmental processes involved in the functioning of government entities but also to increase the flow of information and services within and between different entities. This kind of interaction is only within the sphere of government and can be both horizontal i.e. between different government agencies as well as between different functional areas within an organization, or vertical i.e. between national, provincial and local government agencies as well as between different levels within an organization. The primary objective is to increase efficiency, performance and output. Examples include using e-mail for internal government communication or customized software for tracking progress of government projects. A popular G2G service is e-Police System in Karnataka, India, which has an electronic searchable database of various types of police records.

G2C (Government to Citizens) – In this case, an interface is created between the government and citizens which enables the citizens to benefit from efficient delivery of a large range of public services. This expands the

availability and accessibility of public services on the one hand and improves the quality of services on the other. It gives citizens the choice of when to interact with the government (e.g. 24 hours a day, 7 days a week), from where to interact with the government (e.g. service centre, unattended kiosk or from one's home/workplace) and how to interact with the government (e.g. through internet, fax, telephone, email, face-to-face, etc). The primary purpose is to make government, citizen-friendly. Examples include payment of utility bills or downloading government forms from the Internet. The e-Citizen Portal of Singapore is one of the most highly acclaimed G2C sites. The portal has relevant information organized according to topics and has specific entry points for teenagers, working adults, senior citizens and foreigners. It also has scope for citizen feedback and questions.

G2B (Government to Business) – e-Governance tools are used to aid the business community – providers of goods and services – to seamlessly interact with the government. The objective is to cut red tape, save time, reduce operational costs and to create a more transparent business environment when dealing with the government. The G2b initiatives can be transactional, such as in licensing, permits, procurement and revenue collection. They can also be promotional and facilitative, such as in trade, tourism and investment. These measures help to provide a congenial environment to businesses to enable them to perform more efficiently. Examples include corporate tax filing or government procurement process through the Internet. One primary success story of online government procurement is Malaysia's e-Perolehan web-site which has about 3,500 government procurement centers and about 30,000 suppliers.

G2E (Government to Employees) – Government is by far the biggest employer and like any organization, it has to interact with its employees on a regular basis. This interaction is a two-way process between the organization and the employee. Use of ICT tools helps in making these interactions fast and efficient on the one hand and increase satisfaction levels of employees on the other. Examples include database-driven personnel data sheet software for each government employee that keeps records of all kinds of personnel information, which can be looked up with ease and convenience when required.

3.5 Benefits of e-Governance

In the end, e-Governance is about reform in governance, facilitated by the creative use of Information and Technology. It is expected that this would lead to:

➢ **Better access to information and quality services for citizens:** ICT would make available timely and reliable information on various aspects of governance. In the initial phase, information would be made available with respect to simple aspects of governance such as forms, laws, rules, procedures etc later extending to detailed information including reports (including performance reports), public database, decision making processes etc. As regards services, there would be an immediate impact in terms of savings in time, effort and money, resulting from online and one-point accessibility of public services backed up by automation of back end processes. The ultimate objective of e-Governance is to reach out to citizens by adopting a life-cycle approach i.e. providing public services to citizens which would be required right from birth to death.

➢ **Simplicity, efficiency, transparency and accountability:** In the government: Application of ICT to governance combined with detailed business process reengineering would lead to simplification of complicated processes, weeding out of redundant processes, simplification in structures and changes in statutes and regulations. The end result would be simplification of the functioning of government, enhanced decision making abilities and increased efficiency across government – all contributing to an overall environment of a more accountable government machinery. This, in turn, would result in enhanced productivity, transparency and efficiency in all sectors. An improvement in the transparency of government also raises investor confidence, which in turn contributes to increased foreign direct investment in the long run.

➢ **Expanded reach and decentralization of governance**: Rapid growth of communications technology and its adoption in governance would help in bringing government benefit to the doorsteps of the citizens. Expansion of telephone network, rapid strides in mobile telephony, spread of internet and strengthening of other communications infrastructure would facilitate delivery of a large number of services provided by the government. This

enhancement of the reach of government – both spatial and demographic – would also enable better participation of citizens in the process of governance. E-Government makes decentralization of government easier since data stored in digital format can be updated and accessed from virtually any office within a networked environment.

➢ **Reduces scope of corruption**: Reduced scope of corruption is being another important impact of e-Government. Corruption may significantly reduced by accountability and make it transference. Accountability and transference make much easier to reduce corruption in the e-government process. Combating corruption is a top priority and e-Government can provide an effective tool for that purpose.

➢ **Helps boost in the private sector:** e-Government helps provide boost to the private sector, particularly SMEs, by reducing the time and expense required for businesses to interact with the government. Furthermore, through simplification of government processes and services such as online procurement, the government can reduce barrier to entry for new businesses and also increase competition.

➢ **Greater scope of integration and analysis past data:** Digital storage of data and software applications allow greater scope of integration of activities of different government offices as data can be shared easily and efficiently. Since e-Government allows data to be stored and retrieved easily, experiences and statistics from past projects can be easily used for new similar projects.

The Present renaissance in Information Technology has brought the following features.

(1) The world has narrowed into a neighborhood in a global village, (2) Universality of trade and commerce, (3) Breaking away of geographical and cultural barriers to social development, (4) Technology upgrade, (5) Cost reduction in Information technology applications, (6) Increase in the processing of data for governmental administration, (7) A vision and mission for universal brotherhood for mankind, (8) Increase in social work and journalism interventions for Technology transfer and technology utilization, (9) Increase in social work and counseling services in health and human development, (10) Development of multi professional, multi sectored and multidisciplinary team work in policy analysis, planning, administration and in the delivery of services.

The purpose of implementing e-governance is to enhance good governance. Good governance is generally characterized by participation, transparency and accountability. The recent advances in communication technologies and the Internet provide opportunities to transform the relationship between governments and citizens in a new way, thus contributing to the achievement of good governance goals. The use of information technology can increase the broad involvement of citizens in the process of governance at all levels by providing the possibility of on-line discussion groups and by enhancing the rapid development and effectiveness of pressure groups. Advantages for the government involve that the government may provide better service in terms of time, making governance more efficient and more effective. In addition, the transaction costs can be lowered and government services become more accessible.

3.6 Goals of e-governance

- Improve the internal organizational processes of governments
- Provide better information and service delivery
- Increase government transparency and accountability in order to reduce corruption
- Citizen easy access to government public information
- simplicity, efficient, cost-effective and responsive governance
- Reinforce political credibility and accountability
- Encourage democratic practices through public participation and consultation

3.7 Enterprise Architecture of e-governance

Figure 01: Enterprise Architecture

Enterprise Architecture is the sample structure and standards of e-government systems. All government departments and agencies
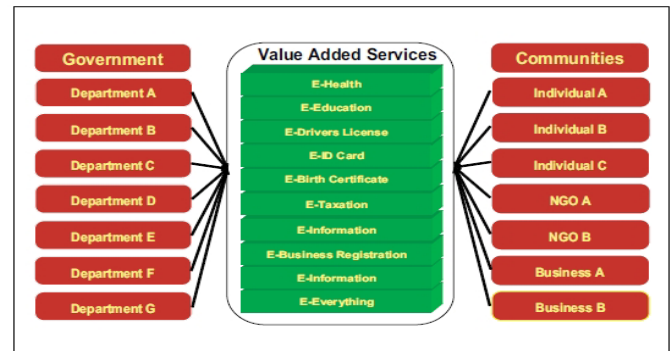

concentrated their services and jobs to one point. Other government agencies, individuals, NGOs, business organization will be benefited or get services from this concentrated point. Whether or not it is called Enterprise Architecture, there is no doubt that we must find an integrated architectural approach that goes beyond IT and incorporates all aspects of the public sector when we implement and renew our IT systems. EA is basically about using IT strategically, and about integrating business development and IT development.

3.8 **Relation between ICT and Development**

Figure 02: Onion-Ring Model (Richard Heeks, October 2005)

There are four main lessons of this model for e-development:
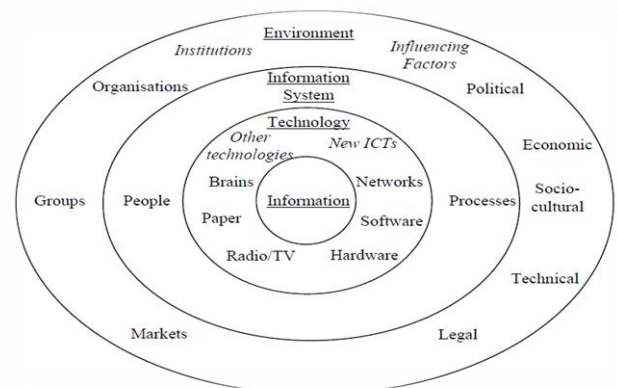
1. **Information is at the heart**. To understand the role of ICTs in development, a good start is to understand the role of information first; only then looking to the technology. A process model for information – the information chain – is presented in e-Dev Briefing 3, to complement the structural model shown here. (Though we discuss in other e-Dev Briefings the dangers of going too far down the information-centred road.)
2. **Embrace all information-handling technologies**. Most information systems in most people's lives still rely on non-digital technologies. Many of these are informal information systems. Don't cast such a spotlight on digital technology that these are ignored.
3. **Information systems not information technologies add value**. Information technology is just a dead box in the corner of the room until you add what's needed to make it an information system: information to handle; people to work with it; processes to contribute to.
4. **Information systems sit in a context**. Information systems are like trees with their roots buried in the surrounding "soil" of organizations, institutions, and environment: political, economic, cultural, etc. This brings two sub-lessons:
a) *Take account of context*. So many e-development failures happen because of context factors: legal restrictions, infrastructural and economic constraints, cultural factors and, above all, politics. In proposing, planning and implementing an e-development project, you ignore context at your peril.
b) *You can't just photocopy e-development solutions*. If you rip a tree from its roots and thrust it down into different soil, the result will be a transplant failure. So it is similar with e-development systems. You can't just pull solutions from one context and imagine they will work in another. Yet, too often, this happens – naïvely thinking that what works in one place must work the

E-government development in largest population countries

Country	E-gov development index		World e-gov. development ranking		Population (in millions)
	2012	2010	2012	2010	
China	0.5359	0.4700	78	72	1,341
India	0.3829	0.3567	125	119	1,225
United States	0.8687	0.8510	5	2	310
Indonesia	0.4949	0.4026	97	109	240
Brazil	0.6167	0.5006	59	61	195
Pakistan	0.2823	0.2755	156	146	174
Nigeria	0.2676	0.2687	162	150	158
Bangladesh	0.2991	0.3028	150	134	149
Russian Federation	0.7345	0.5136	27	59	143
Japan	0.8019	0.7152	18	17	127
Mexico	0.6240	0.5150	55	56	113

same way in another; or that what works for the private sector will work for the public or NGO sector. Every context is different, and work must be done to match system and context. The watchwords must be "customized" not "off-the-shelf", and "adapt" not just "adopt".

3.9 E-governance Status of World and Asian Region (UN Survey 2012)

Progress in online service delivery continues in most countries around the world. The United Nations E-Government Survey 2012 finds that many have put in place e-government initiatives and information and communication technologies applications for the people to further enhance public sector efficiencies and streamline governance systems to support sustainable development. Among the e-government leaders, innovative technology solutions have gained special recognition as the means to revitalize lagging economic and social sectors.

3.9.1 Global leaders at a glance

Building upon the transformative nature of ICT and maintaining their focus on e-government development, all of the top 20 countries in 2012 were high-income developed economies. All have values that range from 164 to 190 per cent of the world average. Of the T 20, 14 are in Northern America and Europe; 3 in East Asia (Republic of Korea, Singapore and Japan); 2 in Oceania (Australia and New Zealand); and 1 in Western Asia (Israel).

In 2012 no country had a true single-sign-on integrated portal. The United States, Republic of Korea, Israel, Australia, Norway, Denmark, Bahrain, Qatar, United Arab Emirates and New Zealand are among the few that come close to a pure one-stop shop portal with information, services and participation services integrated on one site.

World e-govern-ment development leaders 2012

Rank	Country	E-government development index
1	Republic of Korea	0.9283
2	Netherlands	0.9125
3	United Kingdom	0.8960
4	Denmark	0.8889
5	United States	0.8687
6	France	0.8635
7	Sweden	0.8599
8	Norway	0.8593
9	Finland	0.8505
10	Singapore	0.8474
11	Canada	0.8430
12	Australia	0.8390
13	New Zealand	0.8381
14	Liechtenstein	0.8264
15	Switzerland	0.8134
16	Israel	0.8100
17	Germany	0.8079
18	Japan	0.8019
19	Luxembourg	0.8014
20	Estonia	0.7987

Table 01: World E-government development leaders 2012.

3.9.2 Emerging leaders in e-government development

The emerging leaders group includes some developing countries that have begun to catch up with higher-income countries, such as Kazakhstan (0.6844); Chile (0.6769), Malaysia (0.6703), Colombia (0.6572), Barbados (0.6566) and Cyprus (0.6508). Many of these countries have invested considerable resources in e-government in the last few years. They have expanded infrastructure and human skills on which to build further advances in service delivery and employ the full potential of information technologies for long-term sustainable development. They have reoriented their public sector governance systems towards user-centric approaches visible on their websites through multi-channel service delivery features.

Figure 03: Emerging leaders

3.9.3 Countries with a large population

Since each country faces a different set of factors that can help or hinder its overall progress towards e-government development, this year the United Nations Survey is extending special recognition to those countries which, with a population of over 100 million, have made a tremendous effort to provide e-government services to their people, despite the challenges they face.

Table02: Largest population Countries

3.9.4 Regional comparisons

Sustained integration, expansion and consolidation of government online offerings led to more than a 10 per cent increase in the world average of e-government development compared to two years ago. The region of Europe (0.7188) shows the highest e-government development followed by the Americas (0.5403).
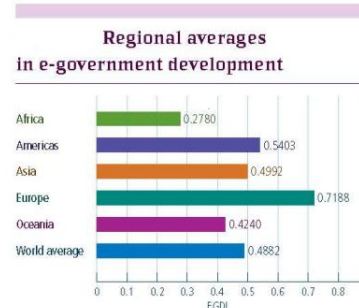

Figure 04: World regional average

3.9.5 E-government in Asia

In 2012, three of the world's top 20 e-leaders are from Asia, and the region as a whole has a higher level of e-government development than the world average. While there has been improvement in providing e-services across the continent, some of the largest gains are found in Western Asia.

Republic of Korea (0.9283), the world leader in e-government, is also the top performer in Asia with around double the average world e-government offerings. The 2nd slot is taken this year by Singapore (0.8474) followed by Israel (0.8100) and then Japan (0.8019). The performance of the United Arab Emirates (0.7344) is especially notable as it advanced 21 positions to the ranking this year of 28th globally and 5th in Asia.

E-government leaders in Asia

Rank	Country	E-gov. development index 2012	E-gov. development index 2010	World e-gov. development ranking 2012	World e-gov. development ranking 2010
1	Republic of Korea	0.9283	0.8785	1	1
2	Singapore	0.8474	0.7476	10	11
3	Israel	0.8100	0.6552	16	26
4	Japan	0.8019	0.7152	18	17
5	United Arab Emirates	0.7344	0.5349	28	49
6	Bahrain	0.6946	0.7363	36	13
7	Kazakhstan	0.6844	0.5578	38	46
8	Malaysia	0.6703	0.6101	40	32
9	Saudi Arabia	0.6658	0.5142	41	58
10	Cyprus	0.6508	0.5705	45	42
	Regional Average	0.4992	0.4424		
	World Average	0.4882	0.4406		

Table 03: E-government leaders in Asia

3.9.6 E-government development in Southern Asia

Table 04: E-government Development in Southern Asia

Maldives (0.4994) leads in the sub-region followed by the Islamic Republic of Iran (0.4876) and then Sri Lanka (0.4357). Service provision in Maldives builds on providing easy access to information to citizens and businesses. Through an 'I Want To' section organized by theme and life cycle, users can find information on service procedures, including how to obtain driver licenses, obtain ID cards and register vehicles. The national site of the Islamic Republic of Iran is available in two languages: Persian and English. Transactional service offerings in the Islamic Republic of Iran are joint public-private partnerships with some available online but also though banks and other local and national institutions.

E-government development in Southern Asia

Country	E-gov. development index 2012	E-gov. development index 2010	World e-gov. development ranking 2012	World e-gov. development ranking 2010
Maldives	0.4994	0.4392	95	92
Iran (Islamic Republic of)	0.4876	0.4234	100	102
Sri Lanka	0.4357	0.3995	115	111
India	0.3829	0.3567	125	119
Bangladesh	0.2991	0.3028	150	134
Bhutan	0.2942	0.2598	152	152
Pakistan	0.2823	0.2755	156	146
Nepal	0.2664	0.2568	164	153
Afghanistan	0.1701	0.2098	184	168
Sub Regional Average	0.3464	0.3248		
World Average	0.4882	0.4406		

A cursory glance at the characteristics of online presence of countries in 2012 indicates a greater number of features than in previous years and a growing recognition of the importance of providing relevant and up-to-date information. The majority of countries (88 per cent) were involved in ensuring that their online e-government offerings were current and updated within the last three months. Two thirds offered a site map or index to guide the user through the services. However, advanced features had an inverse relation to the number of countries represented.

3.9.7 Progress in online service delivery

Information and communication technologies support development. When that development is effective, efficient and enduring it is called sustainable. E-government impacts directly on sustainable development through the use of ICT in public sector social and economic development programs.
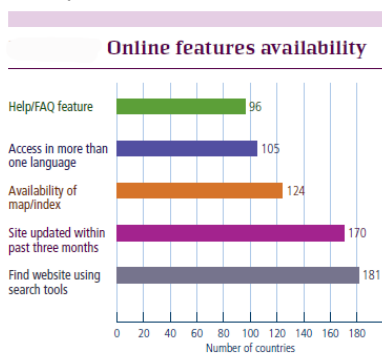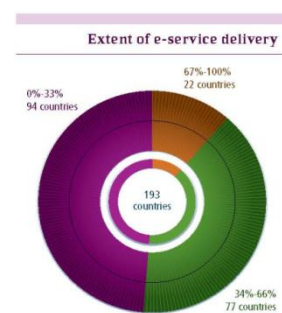
Figure 05: Online features availability

The 2012 Survey assesses four different types of indicators encompassing: information such as documents on laws, policies etc., across sectors of education, health, finance, social welfare and labor; public services such as taxes, fines, licenses; e-participation information and services; and technical features (audio, video, RSS, etc.), which provide a conduit for these kinds of information and services to flow from the government to the citizen.

Figure 06: Extent of E-service Delivery

Top 20 countries in online service delivery

Country	Online service index
Republic of Korea	1.0000
Singapore	1.0000
United States	1.0000
United Kingdom	0.9739
Netherlands	0.9608
Canada	0.8889
Finland	0.8824
France	0.8758
Australia	0.8627
Bahrain	0.8627
Japan	0.8627
United Arab Emirates	0.8627
Denmark	0.8562
Norway	0.8562
Israel	0.8497
Colombia	0.8431
Sweden	0.8431
Estonia	0.8235
Saudi Arabia	0.7974
Malaysia	0.7908

Despite considerable progress in online service, only 22 countries offer 66 per cent or more of the online services assessed. E-services in around 171 countries are below 66 per cent with around half – or 95 countries – providing less than 33 per cent, including three that are not online at all.

Table 05: Top 20 in online service delivery

3.10 Example of E-governance Tools.

The use of ICT tools in governance can be illustrated through the following examples:

3.10.1 **Informing the citizen** - Facilitate information widely available to citizens to increase transparency and accountability, providing information about the political process, about services and choices available.

Fighting Corruption Using the Internet in Kenya
The Information Technology Standards Association (ITSA) of Kenya has launched a pilot project whose aim is to increase public awareness and encourage public participation in fighting corrupt practices. The pilot project will offer a corruption online reporting facility in six towns, two remote locations. The media will form the source points of information which will be routed to the Electronic Graft Management (EGM) Centre. The EGM Centre

will filter this information electronically and forward/channel it to the relevant authorities for action.

Government Procurement System in Mexico
Mexico's federal government established "Compranet" for government procurement as part of its efforts to fight corruption by automating procurement procedures. By facilitating a process of bidding and reverse bidding on-line, it seeks to make government purchasing more efficient and transparent. The system allows the public to see what services and products the government is spending its resources on, and what companies are providing them with these services. There are more than 6000 public sector tenders logged daily, and more than 20 000 service-providing firms are regular users.

3.10.2 **Improved service delivery** – providing the citizens a greater choice, faster delivery and improved efficiency of services.

E-seva center in Andhra Pradesh State of India
The goal of e-seva is to simplify the delivery of city services by providing a wide spectrum of citizen friendly services that will save citizens the bother of running around various departments. Services provided include payment of utility bills; reservations of train tickets; getting birth and death certificates, vehicle permits, driving licenses; transport department services etc. Before the launch of the e-seva project, these services were available at separate offices and were normally time-consuming because of slow processing and often large crowds waiting for the services.

Member Organized Resource Exchange (M.O.R.E.) in St. Louis, Missouri
M.O.R.E. is a computer network project in an inner city neighborhood of St. Louis. The program was established in 1983, and its goal was to use computer networks to help people learn to pull themselves out of poverty. The service delivery programs included: Grace Hill Neighborhood College, which is a neighborhood-based system of education to help prepare community members for employment, and Business and Career Center – an employment database to help low-income persons overcome the information barrier that prevents them from finding jobs. The Center is a successful example of the use of ICTs to increase the access to local institutions by members of marginalized communities.

3.10.3 **Increase citizen participation** - Improving accessibility of citizens to their elected members and higher authority, participation in the decision making process.

Iperbole Internet civic network in Bologna, Italy.

This represents an interconnected gathering point of collective knowledge focusing on "two-way" communication and citizen participation in the information exchange process. Local citizens benefit from a network of internet public places, free internet access points, e-mail and newsgroups. There is direct and remote internet training for beginners; online healthcare support; online services for senior, disabled people and young people; and a "time bank" through which local people can exchange services. There is an online discussion forum; publication of local documents (with abstracts and glossaries) and customer satisfaction surveys.

Democracy Project in North Jutland, Denmark

The task of the Democracy Project was to create an electronic forum for e-democratic dialogue among citizens and politicians, with a particular aim towards November 20, 2001: County Council Election Day (which later turned out also to be General Election Day). In 1997, North Jutland experienced the lowest voter turnout in the Danish election. The object of the Democracy Project was to make visible the decisions made on a regional political level, and to involve the citizens in the process of democracy. Specifically, the County Council also wanted to reach first-time voters, who were known to show a low turnout. Citizens, politicians and first-time voters were invited to take part in the project. The result was a very lively and well-visited web site with a good dialogue among citizens and politicians.

4. E-GOVERNANCE CHALLENGES

♦ **Inadequate ICT Infrastructure within the government**: Bangladesh has no sufficient infrastructural support e.g. adequate PC, Printers, connectivity network, electricity, fair environment. Since only few percent of the total population may use of computers remains beyond the reach of the facilities. Inter connectivity infrastructure of the country developing day by day.

BTCL has ability to provide districts connectivity and it is almost completed. But support system is not properly developed. Upzilla connectivity is started and completed very few. For e-governance this connectivity is very important. For the last few years we are connected with submarine cable that is essential to increase both the speed of data transmission and Internet service in Bangladesh. Because of this we are enjoying some facilities but not enough. Power supply is not enough and available to support e-governance activities.

♦ **Resistance to re-engineering of departmental processes** Successful implementation of e-governance projects requires lots of restructuring in administrative processes, redefining of administrative procedures and formats which finds the resistance in almost all the departments at all the levels. Additionally there is lack of expertise of departmental MIS executives in exploiting data mining techniques, updating and collection of real time content onto website etc. Therefore the content as is collected or maintained by various e-governance portals is unreliable or full of gaps. In such a scenario, it is difficult for any e-governance solution to achieve its intended results. It is often seen that IT system is implemented in a government office; it is very hard to convince government officials to use it. Besides the general lack of awareness about ICT and the fears of change they play a vital rule of non-acceptability of IT systems. Even they fear important data getting lost or they are doubtful about the security features of computers. Technology migration is the biggest challenge.

♦ **Lack of incentive structure for government officials**: In the private sector, it is seen that people skilled in the use of IT are generally valued more than a counterpart who is not as IT proficient. In the government, however, there is no such system of discriminatory valuation of personnel. As a consequence, there is not enough of an incentive for government officials to become IT savvy. There is no way to encourage them to take initiatives. The use of IT is mostly self-motivated and a matter of individual free choice.

♦ **Awareness of government officials about ICT**: It is the mindset of government officials that e-Government has lots of problem. They are not aware about the benefit of E-government. There are a number of reasons why they resist the use of computers beyond usual typing of letters and documents. Some of the primary reasons are mentioned: (1) they are resistant to any kind of change in their familiar working environment; (2) they fear that computerization of different government activities may make some people redundant; (3) they think that computers are meant for low-level typist kind of work.

♦ **Lack of adequate training programs**: Many e-Government or computerization projects suffer gravely from lack of adequate training programs. Training is of vital necessity in familiarizing users with computers and breaking their fears. Some officials go through unplanned 'IT Training', often in another country, and then come back not getting any scope for utilizing his/her newly gathered knowledge of IT and forgetting it all in due time. The training programs are mostly not need-based and arranged at arbitrary periods, not during the implementation phase of an e-Government project. Comprehensive ICT training program for the government officials has to arrange from different offices.

♦ **Lack of sustainability of IT Systems**: Almost all e-Government projects are funded through external sources, primarily foreign funds. This brings about a very vulnerable situation with regards to the sustainability of these projects. As soon as the external fund dries up, it is often seen that there is no fund left even to buy printer paper. As a result, there is a lot of hardware setting in government offices unused and no way to provide support.

♦ **Lack of ownership of IT systems**: A direct result of the system of government transfers is that there is great unwillingness to take ownership of IT-related projects. If hardware and IT systems remain unused, there is no one to take responsibility and encourage others to use the system. There is currently no government structure in place to create this ownership of e-Government at the level of individual offices.

♦ **Underutilization of existing ICT infrastructure:** To a larger extent, the computers in the department are used for the purpose of word processing only, resulting in the underutilization of the computers in terms of their use in data mining for supporting management decisions. The time gap between the procurement of the hardware and development of the custom applications is so large that by the time application is ready for use, the hardware becomes obsolete.

♦ **Attitude of Government Departments:** The psychology of government servants is quite different from that of private sectors. Traditionally the government servants have derived their sustenance from the fact that they are important repositories of government data. Thus any effort to implement DMS and workflow technologies or bringing out the change in the system is met with resistance from the government servants.

♦ **Lack of reliable maintenance**: Another significant problem is that generally there are no in-house maintenance personnel. It is of vital necessity that computers gets fixed as soon as they malfunction or users very easily lose confidence over IT systems. Most offices have contracts with local hardware companies for maintenance, but their services are often not immediate need basis and not fully reliable.

♦ **Lack of necessary regulatory/legal framework**: The regulatory/legal framework in Bangladesh has not yet been modernized to accommodate the growing needs of the electronic world. Still, in government offices, an e-mail has no official value and cannot be legally considered an acceptable mode of communication. There are no laws to protect against cyber-crime, neither are there any laws for electronic authentication. E-Governance applications have to stick and implement policies of the governments in terms of dealing with citizens.

♦ **Inadequate human resource capacity**: In the government sector very little scope appoints of appropriate IT people as well as existing people is not enough to meet the various IT requirement of e-government. On top of that, most of the well-trained IT graduates of the country leave since there is little scope for them in Bangladesh in terms of professional development.

♦ **Supply of electricity across the nation**: With about 50% of the population of Bangladesh having access to electricity, the question of providing access to computers to a large section of the population seems like a two-step problem. Even the fortunate 50% has to suffer daily power cuts. Since there are yet no low-cost methods of running computers without electricity, the issue of electricity has to be solved before a widespread dissemination of ICTs is possible.

♦ **High-cost, low-reliability of Internet access**: Internet access cost in Bangladesh is high and highly unreliable. Now there is main source of internet connectivity is mobile operator but expensive. Internet access and availability of PCs are disproportionately concentrated in Dhaka. Internet infrastructure is not available everywhere and even very rare out of district town. So internet is not accessible of general people.

♦ **Disaster Recovery:** Natural disasters like floods, earthquakes, wars and internal disturbances could cause the E-Governance applications not only loose data, but also make services unavailable. Multiple installations in geographically separated locations with complete backup and recovery solutions must exist. This could create huge problems. Disaster recovery procedures must be in place and practiced from time to time. Applications and data must be redundant and should be available on a short notice to switch from one data center to center.

♦ **Performance and Scalability:** The architecture and technology adopted for the E-Governance initiatives should be scalable and common across delivery channels .It is required to meet growing numbers and demands of citizens. If implemented, the E-Governance portals could become the biggest users and beneficiaries of Information Technology.

♦ **Reporting and Intelligence (Better governance):** Data center usage (CPU, storage, network etc), peak loads, consumption levels, power usage along with time are some of the factors that needs to

be monitored and reported for better utilization of resources. It minimizes costs and plan well. Profiling data enables better visibility into various services provided by the government.

♦ **Systems Integration and Legacy Software:** Not only the applications that are already deployed and providing services are to be moved to the cloud, but also integrate with applications deployed in the cloud. The power of Information Technology comes in co-relating the data across applications and pass messages across different systems to provide faster services to the end users.

♦ **Adult literacy rate:** The adult literacy rate in Bangladesh is not enough. Most of the people have not enough knowledge of using computers, e-government or electronic service delivery. Literacy should be increased and awareness should be developed. Most of them are not literate enough but using mobile phone to communicate and even writing message to each other. So training and awareness program may develop the situation.

5. RESULTS AND ANALYSIS

ICT is essential topic now in Bangladesh in respect of e-governance and digitization. About all middle class family and University level student using a PC. Another point of using latest featured mobile phone that is providing support almost of a computer. Mobile operator providing various supports like virtual bazaar, bill pay, train ticket buy, money transfer, alert, information, awareness etc. Daily newspapers and magazine publishes a special supplement containing latest news of ICT and improvement relating to ICT. IT fairs and workshops are going on to aware the people throughout the year of the country, districts, and even Upzilla. It may be mentioned that next generation of Bangladesh is taking the lead in these IT efforts.

5.1 Computer and Network

First computer was introduced in 1964 with the installation of an IBM 1620 computer at the Atomic Energy Commission of Bangladesh. In the late 1980s, the printing and publishing industry start using computers and played a pioneer role in the use of personal computers. Now different private and public sectors organization use computers in their daily operation to improve performance, quality and save time. Financial organization like private sectors banks are more advance in this respect. They maintain a countrywide network to connect whole branches and providing online service and ATM service. Public sector organization is using LAN and few using official applications to improve their performance.

Percentage of households having ICT facilities

Type of facilities	National		Rural		Urban	
Year	2010	2005	2010	2005	2010	2005
Telephone	2.07	2.87	0.70	0.33	5.79	10.36
Mobile Phone	63.74	11.29	56.77	6.05	82.74	26.73
Computer	3.01	1.36	0.97	0.17	8.58	4.88
email	1.39	0.20	0.39	-	4.10	0.81

Source: BBS, Household Income and Expenditure Survey 2005 &2010

Table 06: Percentage of households having ICT facilities

5.2 Access to Information: With 45.3% functional literacy rate (BANBEIS, 2010) and majority of the population based in rural areas, the people of Bangladesh predominantly rely on traditional and relatively low-tech ICT options to have access to information. The size of user base for public AM radio and terrestrial TV in Bangladesh is comparable to its South Asian neighbors (except Nepal, which enjoys an exceptionally high radio listenership rate). Figure shows the comparative data for literacy, telephone and internet density and other traditional access among four South Asian countries.

*Figure 07: Access to information of Asian countries*
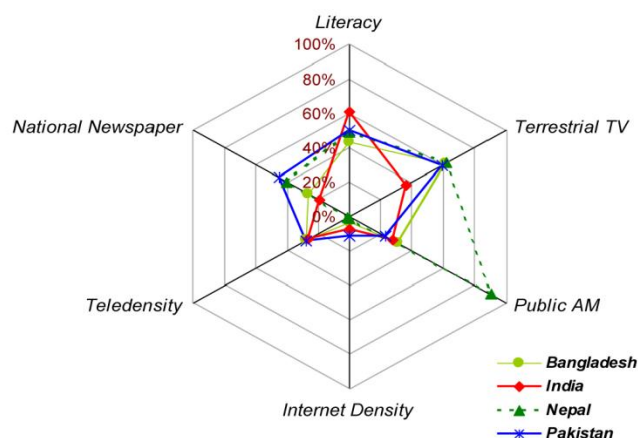
In the ICT Development Index released by the International Telecommunication Union (ITU), Bangladesh is ranked is still not encouraging yet. Out of 154 countries, rank of Bangladesh is 138, only above Nepal (ITU, 2010). On the other hand, public access to ICTs with and without Internet connectivity during last one decade (2001-2010) mainly through private and not-profit initiative played an important role in reducing digital divide, although it was not adequate proportionate to the needs.

5.3 Internet

Internet introduce in Bangladesh about in 1993 using e-mail service by dial-up connections offered by three Internet Service Provider (ISP) companies. During this time dialup connection was the main source of internet and used mainly for email. On the other way we may tell usage of email introduce internet. Eudora and outlook express was using for mail transaction thorough ISP. First private ISP was providing internet and it was expensive. In 1996,
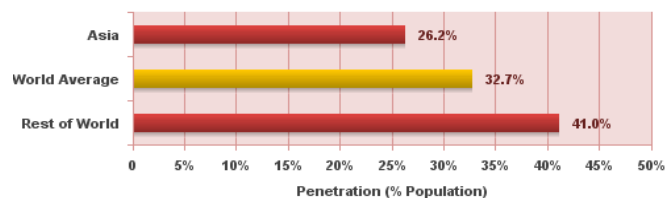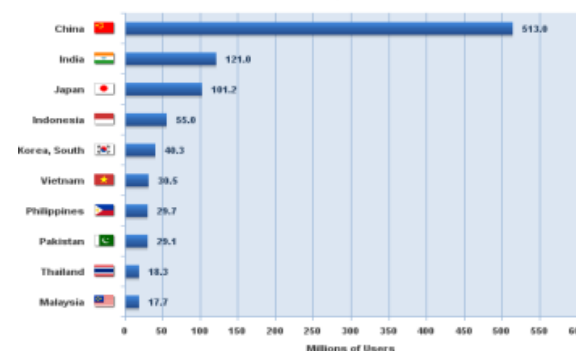

Source: Internet World Stats - www.internetworldstats.com/stats3.htm
1,016,799,076 Internet users in Asia estimated for 2011Q4
Copyright © 2001-2012, Miniwatts Marketing Group

Bangladesh tested the Internet (VSAT-based) for the first time. Inter connection was very expensive and limited access to the Internet for business and general users. Government of Bangladesh decided to reduce VSAT cost and opened the door for general users to access the Internet at a cheap rate. Now Bangladesh is connected with fiber optic submarine cable for adequate internet bandwidth with a very cheap rate. Day by day internet rate is going to be reduced and people access to internet growing for various purposes.

Figure-08: Internet Penetration of Asia in respect of Whole world.
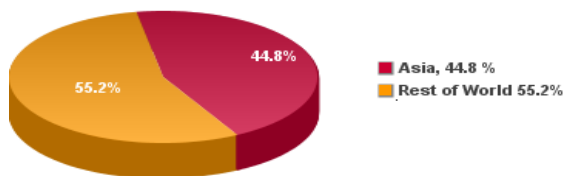

Source: Internet World Stats - www.internetworldstats.com/stats3.htm
2,267,233,742 Internet users in the World estimated for 2011Q4
Copyright © 2001-2012, Miniwatts Marketing Group

Figure-09: Top Asian countries of Internet usage.

Internet Users in Asia
December 31, 2011

Asia, 44.8 %
Rest of World 55.2 %

Source: www.internetworldstats.com/stats3.htm
1,016,799,076 estimated Internet users in Asia for 2011Q4
Copyright © 2001-2012, Miniwatts Marketing Group

Figure-10: Internet users in Asia and rest world

Table-07: Internet Usage and Population of Asian countries.

ASIA INTERNET USAGE AND POPULATION						
ASIA	**Population (2011 Est.)**	**Internet Users, (Year 2000)**	**Internet Users 31-Dec-2011**	**Penetration (% Population)**	**Users % Asia**	**Facebook 31-Dec-11**
Afghanistan	29,835,392	1,000	1,256,470	4.2 %	0.1 %	257,180
Armenia	2,967,975	30,000	1,396,550	47.1 %	0.1 %	242,140
Azerbaijan	8,372,373	12,000	3,689,000	44.1 %	0.4 %	604,040
Bangladesh	158,570,535	100,000	5,501,609	3.5 %	0.5 %	2,252,800
Bhutan	708,427	500	98,728	13.9 %	0.0 %	64,000
Brunei	401,890	30,000	318,900	79.4 %	0.0 %	234,800
Cambodia	14,701,717	6,000	449,160	3.1 %	0.0 %	449,160
China *	1,336,718,015	22,500,000	513,100,000	38.4 %	50.5 %	527,380
Georgia	4,585,874	20,000	1,300,000	28.3 %	0.1 %	725,160
Hong Kong *	7,122,508	2,283,000	4,894,913	68.7 %	0.5 %	3,793,100
India	1,189,172,906	5,000,000	121,000,000	10.2 %	11.9 %	41,399,720
Indonesia	245,613,043	2,000,000	55,000,000	22.4 %	5.4 %	41,777,240
Japan	126,475,664	47,080,000	101,228,736	80.0 %	10.0 %	6,267,540
Kazakhstan	15,522,373	70,000	5,448,965	35.1 %	0.5 %	362,420
Korea, South	48,754,657	19,040,000	40,329,660	82.7 %	4.0 %	5,355,880
Kyrgystan	5,587,443	51,600	2,194,400	39.3 %	0.2 %	64,620
Laos	6,477,211	6,000	527,400	8.1 %	0.1 %	129,660

Macao *	573,003	60,000	308,797	53.9 %	0.0 %	199,720
Malaysia	28,728,607	3,700,000	17,723,000	61.7 %	1.7 %	12,060,340
Maldives	394,999	6,000	114,100	28.9 %	0.0 %	114,100
Mongolia	3,133,318	30,000	355,524	11.3 %	0.0 %	285,340
Myanmar	53,999,804	1,000	110,000	0.2 %	0.0 %	n/a
Nepal	29,391,883	50,000	2,031,245	6.9 %	0.2 %	1,403,420
Pakistan	187,342,721	133,900	29,128,970	15.5 %	2.9 %	5,887,400
Philippines	101,833,938	2,000,000	29,700,000	29.2 %	2.9 %	27,033,680
Singapore	4,740,737	1,200,000	3,658,400	77.2 %	0.4 %	2,661,360
Sri Lanka	21,283,913	121,500	2,503,194	11.8 %	0.2 %	1,182,720
Taiwan	23,071,779	6,260,000	16,147,000	70.0 %	1.6 %	11,600,260
Tajikistan	7,627,200	2,000	794,483	10.4 %	0.1 %	27,200
Thailand	66,720,153	2,300,000	18,310,000	27.4 %	1.8 %	13,276,200
Timor-Leste	1,177,834	0	2,361	0.2 %	0.0 %	n/a
Turkmenistan	4,997,503	2,000	110,924	2.2 %	0.0 %	12,060
Uzbekistan	28,128,600	7,500	7,550,000	26.8 %	0.7 %	105,920
Vietnam	90,549,390	200,000	30,516,587	33.7 %	3.0 %	3,607,220
TOTAL	**3,879,740,877**	**114,304,000**	**1,016,799,076**	**26.2 %**	**100.0 %**	**183,963,780**

NOTES: (1) The Asian Internet Statistics were updated for December 31, 2011 (2) The demographic (population) numbers are based on data contained in Census Bureau. (3) The usage numbers come from various sources, mainly from data published by Nielsen Online , ITU , and other trustworthy sources. (4) Data may be cited, giving due credit and establishing an active link to Internet World Stats. China figures do not include SAR Hong Kong, SAR Macao nor Taiwan, which are reported separately for statistical purposes. Copyright © 2012, Miniwatts Marketing Group . All rights reserved worldwide.

Table-08: Internet user and Population of Asia and rest world.

INTERNET USERS AND POPULATION STATISTICS FOR ASIA						
ASIA REGION	**Population (2011 Est.)**	**Pop. % World**	**Internet Users 31-Dec-2011**	**Penetration (% Population)**	**Users % World**	**Facebook 31-Dec-2011**
Asia Only	3,879,740,877	56.0 %	1,016,799,076	26.2 %	44.8 %	183,963,780
Rest of World	3,050,314,277	44.0 %	1,250,434,666	41.0 %	55.2 %	615,128,380
WORLD	6,930,055,154	100.0 %	2,267,233,742	32.7 %	100.0 %	799,092,160

TOTAL		%			%	

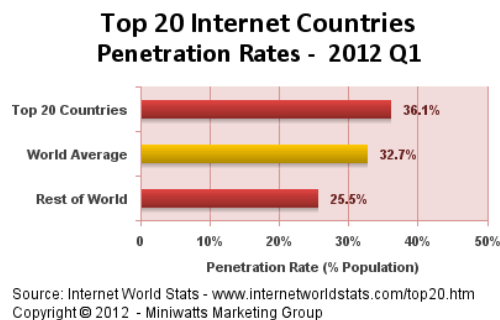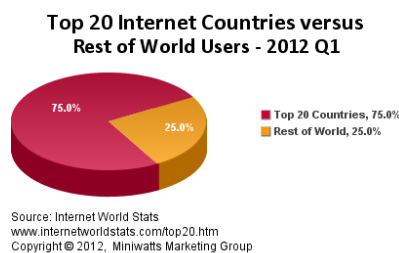Figure 11: Top 20 Internet Countries and rest world

Figure 12: Internet Penetration of Top 20 countries and rest world

5.4 Telecommunication Infrastructure

Bangladesh has countrywide telecom backbone network; both optical fiber and wireless. The mobile operators, Bangladesh Telecommunications Company Limited (BTCL), Power Grid Company of Bangladesh (PGCB), Bangladesh Railway (BR), some PSTN operators and new entrant Nationwide Telecommunication Transmission Network (NTTN) operators are the key players in developing backbone infrastructure in the country. All but the PSTN operators cumulatively have deployed almost 15,000 km optical fiber backbone covering 59 districts.

Bangladesh Telecommunication Company Limited (BTCL) exercises monopoly control in developing the telecommunication infrastructure of the country. At present, there are 1028190 fixed-line telephone subscribers (BTRC website), 57,728 international circuits (BTRC website), and 13,26,159 nation-wide dialing circuits (BTRC website) in Bangladesh. BTCL has started to build a national structure for high speed Digital Data Network to connect the sixty-four district headquarters

In addition BTCL, most of the mobile operators and some of the ISPs have microwave (wireless) backbone throughout the country. The two wireless broadband (WiMAX) operators are also rolling out their backbone or share network infrastructure from other operators.

Bangladesh has already joined the fourteen nation SEA-ME-WE4 submarine cable consortiums to install submarine optical fiber cable that will provide national broadband connectivity with Information Super Highway access, thus enabling all ISPs, both public and private, to have direct access globally.

The total number of Internet Subscribers has reached 31140.804 thousand (31140804) at the end of February 2012. (BTRC website)

The total number of Mobile Phone subscribers has reached 89.457 million at the end of March 2012. (BTRC website)

Mobile phone used by households

Locality	2000	2005	2010
National	1.50	11.29	63.74
Rural	0.30	6.05	56.77
Urban	6.50	26.73	82.74

Source: BBS, HIES 2000 and HIES 2005 & 2010

Table-09: Mobile phone used by households.

5.5 IT Companies and E-commerce

Currently in Bangladesh, there are more than 1,000 hardware showrooms and nearly 8,000 IT institutions. Large organizations including financial institutes and Telecom companies also import a large number of servers for supporting their solutions and datacenters. The structure of the PC/Server market is heavily controlled by the few importers where there are less than 10 large importers who import bulk of these items. The retail market, on the other hand, is very fragmented with thousands of small entrepreneurs with small retail outlets (these also work as maintenance set ups) all over the country (in Dhaka alone there are over 2,000 such outlets). There is a strong supply chain structure across importers and retailers. More than one hundred companies are involved in software development. Sixteen percent of these firms export their product; ten percent are completely export-oriented. Forty percent sell their software in local markets and forty-eight percent sell their product in both domestic and foreign markets.

Bangladeshi businessmen have already introduced e-commerce, in a limited manner, in Business to Consumer format. Wireless Application Protocol service is also available in Bangladesh allowing for use of the Internet through mobile phones. This has introduced e-commerce to a wide area in Bangladesh. Thus far, there is no law to protect the interest of cyber consumers, though IT professionals and private entrepreneurs are demanding a law that treats different types of software and programs as intellectual property and provides proper legal actions in case of violation. Expansion of e-commerce in Bangladesh is dependent on the adoption and enforcement of these laws. Certifying Authorities is great improvement in the e-commerce field.

5.6 IT Education

Bangladesh currently has 26 public and 56 private universities. In 2011, post-graduation degree in ICT is offered by 25 public universities and 46 private universities. There are also some local and foreign IT institutions that offer different types of certificate and

ICT Graduates in Last 5 Years					
Year	2003	2005	2008	2009	2010
Number of graduates	1500	4000	5000	4000	5000

Table 10: Number of Graduates in Public and Private Universities.

diploma courses. National and multinational firms engaged in IT business manage most of those institutions. The government of Bangladesh has already introduced computer-related courses in secondary school and the higher secondary level so that students can become adept at using computers and IT. This effort to boost the IT revolution has had a positive impact on IT culture in Bangladesh. Details are as follows.

The numbers of graduates in the last 5 years are as follows:

Table 11: ICT Graduate in last 5 years.

5.7 Commercial and financial institutions

Commercial and financial institutions such as banks, insurance companies, and private business concerns are also using various means of ICT. Every day,

Number of Graduates in Public and Private Universities (2011)

University category	Have ICT course	Number of graduates
Public Universities	25	2500
Private Universities	46	6900
Total	71	9400

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more websites about Bangladesh are being uploaded on the web. Side-by-side voluntary and service-providing organizations are opening up a web entity every day. All users primarily rely on computers for word processing, e-mail correspondence, accounting, and Internet browsing. Rates of using computers for maintaining database and payroll, for personal e-mail by employees, and for software application are not negligible either.

Most Bangladeshi banks, both public and private, such as Bank Asia Limited (www.bankasia-bd.com), BASIC Bank Limited (www.basicbanklimited.com), BRAC Bank Limited (www.bracbank.com), Dhaka Bank Limited (www.dhakabank.com.bd), Dutch-Bangla Bank Limited (www.dutchbanglabank.com), Eastern Bank Limited (www.ebl-bd.com), EXIM Bank Limited (www.eximbankbd.com), Islami Bank Bangladesh Ltd (www.islamibankbd.com) have websites containing different types of statistical information. All banks are now computerized, at least at the head office level. Private Banks are more computerized than public banks. At present, people can pay their utility bills with their credit/debit cards at any bank in Bangladesh. Some banks provide on-line features that allow customers to check balances and deposits.

5.8 Printing, Publications and Multi-media Sector

Bangladeshi professional have produced various types of kids, entertainment and educational CDs. Information stored in these CDs range from the history of the country, its independence and war of liberation, cartoons, fairy-tales for kids. A number of digital magazines are published every month in Bangladesh in CD-ROM format. On-line versions of all most major newspapers and magazines are also now available. More than forty-five IT magazines and periodicals already exist. Most of these are published both in paper and CD-ROM format; some also publish a web version. Some organization is working to produce product prospectus, leaflet and other documents of some international band of different world organization.

5.9 Outsourcing

There are so many individual and organization is working for outsourcing on-line. It is good opportunity for the country to earn foreign money. Some young people is working from different districts and involving new generation.

5.10 Government Agencies

Overall government offices have computes, LAN and internet. Some offices and officers using computer as showpiece, Some are using as a type machine, some are using multimedia device for audio, video, games, somewhere using as internet device for official or personal. Very few offices are using computers, LAN and internet for official productivity. Very few or rare one have their core business related application. About 60% to 70% offices have official email system. But official email is using 10% to 20%.

Bangladesh has one official government portal (www.bangladesh.gov.bd) where all government ministries and divisions website link is given for easy to access. Some very essential government websites such as Ministry of Finance (www.mof.gov.bd), Ministry of Public Administration (www.mopa.gov.bd), Ministry of Agriculture (www.moa.gov.bd), Ministry of Education (www.moedu.gov.bd), Ministry of Education (www.moedu.gov.bd), BANBEIS - Bangladesh Bureau of Educational Information and Statistics (www.banbeis.gov.bd). Cabinet Division (www.cabinet.gov.bd), Bangladesh Bank (www.bangladesh-bank.org). So 95% percent government organization have website. Some are providing basic information, some are broadcasting advance information and very few are providing manipulation data. Most of the website data are not updated regularly, even some mistakes is there and most of them not updating latest information of the organization.

5.11 Internet Infrastructure

Bangladesh has one of the lowest internet penetration rates in the South Asian region (6%). 94% of the active internet connection is through mobile phone providers. The 101 national and 138 zonal Internet Service Providers (ISP) alongside two WiMax service providers account for the rest. (DBSP, 2010)

5.11.1 Gateways and Exchanges Bangladesh Telephone and Telegraph Board (BTTB), the state incumbent and regulator before the inception of BTRC (and BTTB eventual break up to three different entities) used to solely control the international voice and data traffic in Bangladesh before the implementation of the International Long Distance Telecommunication Services Policy, 2007 (ILDTS Policy, 2007).

According the experts, the idea was to partially liberalize the international voice and data traffic segment for the local operators with the introduction of a new network topology. Under this plan, the Interconnection Exchanges (ICX) is responsible for managing all the local voice traffic, whereas the International Gateways (IGW) deals with the outgoing and incoming international calls. Country's data traffic is managed through International Internet Gateways or IIGs.

Bangladesh Telecommunications Company Ltd. (BTCL), the state PSTN operator (after the BTTB breakup) got the permission to also operate as IGW, ICX, and IIG, thus distorting the level playing field for other operators in those markets. In addition, the regulator permitted 3 IGW, 4 ICX, and one more IIG operators. But in practice, this semi-liberalization process was not effective in decreasing service prices for the Access Network Service (ANS) providers (as pricing negotiation with international entities by IGW and IIGs are closely monitored and controlled by the GoB). With the new ILDTS policy of 2010, the regulators officially wanted to promote more competition. However, the provision that empowered GoB to decide on the numbers of IGW, ICX, and IIG licensees virtually eliminated the opportunity for the market to decide on the basis of supply and demand of such service providers, and also in ensuring cost effective solutions (for the general consumers) for interconnection and bandwidth price negotiations (both international and local). In addition, the GoB explicitly prohibited the participation of foreign investment in this segment through the latest ILDTS policy.

5.11.2 Availability, Usage, and Quality

In terms of information infrastructure, there is already a network of 15,000 km optical fiber, which covers 59 of the 64 districts in Bangladesh. Bangladesh Telecommunications Company Ltd. (BTCL, the incumbent PSTN operator), Power Grid Company of Bangladesh (PGCB), Bangladesh Railway, and the mobile operators are the primary developers of this fiber backbone. BTCL and GP (leasing Bangladesh Railway's) own the largest, active fiber backbone in the country. PGCB's one is underutilized and the other mobile operators either share fiber networks of the incumbents or have built their own.

The country is connected with the international information superhighway through a single undersea cable (SEA-ME-WE-4). Its landing station is in Cox's Bazar (at the South-Eastern part of Bangladesh). Till recently, access to this landing station, and the cable's routing to the POPs were solely controlled by BTCL (from where IGWs and IIGs can access). The regulator determines the price of bandwidth access. But the carrying cost for the bandwidth (from center to the other parts of the country) and other backhaul costs are determined by BTCL and Bangladesh Submarine Cable Company Ltd. Or BSCCL, which are not market driven and one of the core reasons, the private operators are not getting benefit of low price access to bandwidth. The Government of Bangladesh (GoB) is actively considering connecting with an international terrestrial cable through private sector, in addition to its SEA-ME-WE-4 undersea cable (BTRC, 2011).

5.12 Applications and Services

A range of services catered towards the general population have increased rapidly in recent years, both in public as well as private domains. In education sector, the GoB is using telecommunication to strengthen its knowledge network for teacher's training, educational administration, and distance education. Public examination and admission test results are increasingly disseminated among people using web and SMS based systems. In order to ensure equitable public access to information (online and offline), the GoB is investing on developing information centers (commonly known as Union Parishad Information Service Center or UISC) at union level in Bangladesh. Each UISC is managed by a local entrepreneur, selected jointly by the union's top public administrative officer (UNO) and the elected chairperson of that union. Lack of electricity, poor connectivity, scarcity of localized contents and services, and most importantly, the absence of effective local entrepreneurs are some of the key challenges identified by thee experts in the UISC domain.

Value Added Service (VAS) market is another emerging market for the mobile phone and internet users. The mobile based health and educational helpline services are fast becoming popular. "BBC Janala", a BBC initiative

for learning English via mobile phone/Internet is increasingly used by relatively young segments of both urban and rural population. In addition, ring tones, songs, and video clip downloading practices via mobile phones and internet are also on the rise in Bangladesh.

5.13 Existing ICT infrastructure and advantages:

- Submarine Cable connectivity 43.8 Gbps
- Bangladesh Railway optical fiber line
- Communication and Information Technology policy 2006.
- Established gov.bd domain for all ministries and government office.
- Bangladesh Computer Council
- High-Tech park at Kaliakur (proposed)
- ICT incubator in Kawranbazar (proposed)
- Country-wide telecommunication infrastructure
- Power Grid Company of Bangladesh (PGCB) fiber line
- Secretariat backbone
- Voter Database –Bangladesh Election Commission

5.14 Policy and Regulatory Framework

- ❖ 1885: The Telegraphy Act
- ❖ 1933: The Wireless Telegraphy Act
- ❖ 1998: The National Telecommunication Policy
- ❖ 2000: Copyright Act enacted with inclusion of Software and ICT

- ❖ 2001: First ICT Policy drafted

- ❖ 2002: National ICT Policy adopted

- ❖ 2006: ICT Act enacted

- ❖ 2008: Revised Policy Drafted

- ❖ 2009: New ICT Policy approved

- ❖ 2009: ICT Act 2006 amended

- ❖ 2010: Rules for Digital Signature (Certifying Authority)
- ❖ 2007 and 2010: International Long Distance Telecommunication Services (ILDTS) Policy
- ❖ 2001 (amended in 2010): Bangladesh Telecommunications Act of

5.15 Observation of primary data:
Data collected on the basis of some e-governance tools.

Shown in the Appendix A.
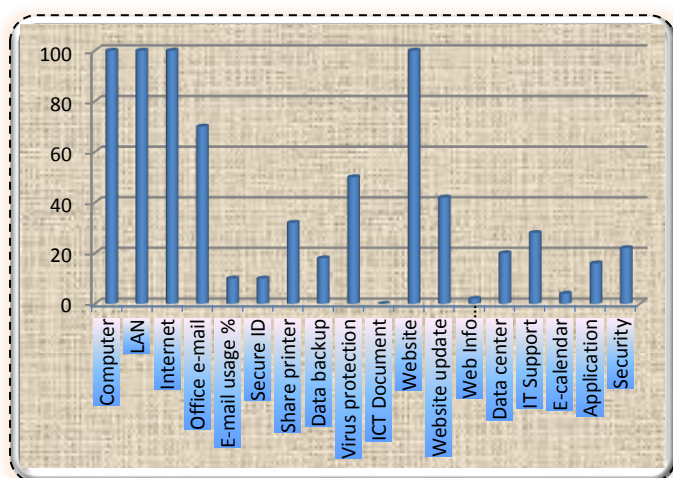
5.16 Graphical Presentation of Data Analysis

Figure 13: Graphical presentation of data

6. SUMMERY OF FINDINGS

Some steps to follow to proceed in the e-governance race. In the primary level all department and activities should be personal computer dependent and should be interconnected. In the next level should have a LAN, Internet connection, own mail system and own domain website. In the final stage, interdepartmental activities should be integrated and intradepartmental activities should be accessible and available for other. In respect of Bangladesh, some change is going on but not in the level. Some ministries or department are working in the first stage and some are second stage. But none are in the last stage. Exploration of this mater and indication of some pin points has been presented in the project work.

6.1 General observation:
Data collected from the ministries and find the following information of observation.

Computer and printer: According to collected data all ministries and division have computers and printers. Actually all required officers and staffs are not getting computers and printers. Very few organizations have fully equipped with computers, printer and scanner. Overall have computers and others.

LAN: Overall ministries and divisions have LAN facilities and similarly not all level. About 90 percent are using LAN only for internet purpose. Even not for file and printer sharing. Ministry of Cabinet operated a project to connect inter-ministries have improved LAN environment much more. This project also has provided LAN installation for required ministries.

Internet: Very few ministries have dedicated internet line with sufficient bandwidth. Most of them have no sufficient arrangement for secure internet connection. There is no monitoring, bandwidth control, restriction and policy for internet use. Bangladesh Computer Council (BCC) providing internet facilities through inter-ministries connectivity and many ministries using this facility for internet. Internet may use for official email and data access of public interest. But it is rare in Bangladesh.

Office Email: In the government sector, official email is a government official identity of an officer. In respect of communication it is very important. It is one of the primary steps of e-governance or digitization. So all official should have an official email and should be widely used for communication. According to collected data 70% to 80% offices have official email. From them more than 90% email system managed by ISP, Vendor or third party. So it very tough to manage, add, subtract and edit. Similarly email is web based access and difficult to use.

Office Email usage: Government officers using email and rate is average good. But they are very much interested to use personal email like Yahoo and Google. Office email usages rate is very low. We need awareness and implementation of change management to change this tendency. Similarly policy should be defined from the central top management.

Secure ID: Secured id is used to access control, resource usage control, proper monitoring, system control and security ensure. It reduces unauthorized access and misusages. It is essential for an organization. According to collected data secured id is used in the 10% organizations.

Share Printer: This is resource sharing to reduce extra cost of resources. For simple job no need individual printer and one floor or one section may use central printer by using LAN.

Application or central application: A software package or database application that deals with core business of an organization and it is an appropriate use of Information Technology. Similarly central database application deals with all sections or divisions functionality in one application. Very few organizations developed that kind of application. Data from whole application or data from parts of application may be related with public interest. Public interested data should come to a point of web access so that general people may get the necessary data easily.

Data Backup: We may take data backup by various media. But professional data backup media is tape. Main source of data backup is application data. Most of the cases there is no application no backup. We may take email backup. There is 70% Official email and 5% email server hosted to the user premises. So there is no email backup.

Virus Protection: Antivirus solution is very important for a system. We get 70% organization have antivirus solution. But all are not updated and about all

are individual PC solutions. About 5% have central solution and about 20% regular updated.

ICT documentation: Government offices are very poor in the ICT documentation. Lack of documentation sometimes raise great problem specially vendor done something or old employee done something but no record what and how they have done this. Documentation makes easy next update or improvement in absence of someone.

Website: About 100% offices has own website. Websites 50% is not providing appropriate data and necessary document. Some are not properly designed and colored. Every ministry and division has a domain name and it is selected by individual office. Most of the cases these are maintained by vendor or any third party. In respect of websites security measurement is very weak.

Website update: 50% websites are updated regularly. Most of them are not providing accurate public interest information and documents.

Website data manipulation: It is also an advance feature of IT adoption of an organization. One organization has database application and internally lots of data manipulation is there. Some data may have access of general people and have manipulation capacity from the respective organization website. As a result various people may get the data according to their requirement.

Data Center: A data center is a centralized repository, either physical or virtual, for the storage, management, and dissemination of data and information organized around a particular body of knowledge or a particular business. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and security devices. In that sense, data center may be synonymous with network operations center (NOC), a restricted access area containing automated systems that constantly monitor server activity, Web traffic, and network performance.
Only 20% organization have data center and even all are not fully organized and secured. Some organization like Bangladesh Bank, Bangladesh computer Council (BCC), Bangladesh Election Commission and Finance Division have organized data center.

IT supports: IT support available in the 30% offices. Other offices are managing support by calling vendor as necessity basis. IT development and support is very poor in the government offices. Another major problem is available IT support people is not appropriate for the existing support and improvement of the existing situation. It is also a factor of IT field not to developed in a level because lack of appropriate IT people in appropriate position.

E-calendar: It is an advanced feature of IT adoption. Maintain appointment in a central calendar of server and shared with others in the necessity basis. Common shared appointment or Meeting call used a central calendar of server that will aware everyone about his appointment. It also provides options like accept, deny or proposed other time of meeting. Finally this appointment will give you an alarm just before 15 or 30 minutes of the meeting.
Security and protection: Security measurement is very poor and very few organization using firewall for internal and external purpose. About all offices are using internet. But there is no sufficient security system for data and network protection. Sometimes all networks become infected by virus, warms and Trojans. It is also lack of protection.

6.2 Comparatively advanced organizations

Finance Division: Finance Division (FD) deal with Account and Budget of Government. Finance Division direct deal with Budget consists of 21 Budget sections dealing with 50 ministries (MTBF) and their divisions and sections budgeting. Controller General of Accounts (CGA) office deals with accounts of 6 DCA, 58 DAO and 49 CAO. Finance Division maintaining total connectivity and intranet. FD has one central datacenter and one disaster recovery site at CGA. One central application named Integrated Budget and Accounting System (IBAS) is now working in the finance division that maintaining and controlling total accounts and budget.

There is one central own mail system using by FD, CGA, 49 CAO, 6 DCA and 58 DAO for government communication, circulars and notices. 49 CAO, 6 DCA and 58 DAO each has one email address, FD and CGA officers have individual official email addresses. It is the largest network in the government sector of Bangladesh and using central application and email system in the whole country. It is also an example of official email usage of the government sector.

Examination conduct and Result publishing: Main function of Education Board (EB) to provide support for SSC and HSC examination. This support covers making schedule, taking exam, check script and publishing result. EB is doing huge deal of identity of script, script mark tracking, result manipulation and publishing by using ICT. It is now very easy to publish the result of the examination and in proper time. Similarly Department of primary and mass education, Bangladesh National University is providing the exam result by website. They also provide result through mobile massaging system. It is also very helpful for people.

Public University admission test is a huge dealing like providing the prescribe form, collect the form, taking exam and publishing result. Now collecting form and result is very easy from the respective website.

Ministry of Public Administration: Establishment providing web base a PDIS database for all Admin cadre officers and others cadre senior officers. It is online and very helpful for officers. Whenever necessary they may collect their Personal Data from this database by providing own ID and Password. It should be updated with full cadre officers.

Roads and Highway: Roads and Highway is providing some database service and manipulated data for their stakeholder through their website. The e-Government initiative of Road and Highways Department (RHD) involved the launch of a website that provides a variety of information, data and notices to users. Website users include the private sector, related government offices, ordinary citizens, and donor agencies. The website features the following services: Contractor database, Tender database, Schedule of rates database, Project Monitoring System.

National Board of Revenue (NBR): The National Board of Revenue (NBR) is the central authority for tax administration in Bangladesh. Administratively, it is under the Internal Resources Division (IRD) of the Ministry of Finance (MoF). NBR is responsible for formulation and continuous re-appraisal of tax-policies and tax-laws in Bangladesh. The main responsibility of NBR is to mobilize domestic resources through collection of import duties and taxes, VAT and income tax for the government

The main function of this department is to earn revenue on behalf of the government ofBangladesh. It facilitates the trade community through services such as Counter Bailing. It provides facilitation to the government for negotiation of bilateral treaty. And it also provides support to the Ministry of Finance in preparing the annual budget for the government of Bangladesh. The NBR is one of the most advanced users of ICTs in the government, with several sophisticated software applications managing their routine internal work. Some of the software applications used in the Customs Department are: ASYCUDA++ (Automated System for Customs Data), BOND**,** DADO**,** VALUATION**,** and CIMS (Customer Information Management System). Some of the software applications used in the Tax Department are TAN System, TCAN (Tax Collection Account No)**,** and CCS (Challan Collection System). Some of the software applications used in theTax Department are VIS (VAT Information System) and VMIS (VAT Management Information System). A majority of the employees at NBR have basic computer literacy and ICT training programs at NBR is a regular process. NBR also has a website that generally updated every 3 months. The purpose of this website is to provide Tariff search engine, Baggage rule, SRO, Budget speech, and any other notifications and announcements to the user.
Since Customs functions at the gateway for import and export of goods, it plays a critical role in the import-export trade chain. In order to make customs procedures more transparent and to achieve more trade facilitation, a number of measures have been taken in past few years. With the introduction of ASYCUDA++ and Direct Traders Input (DTI) automation in customs clearance has begun. Recently, a full automation scheme is on way of implementation in collaboration with the Chittagong Chamber and the Task Force. Once the full automation is completed the importers and exporters will be able to access customs server from their offices or homes and will be able to submit their customs declaration online.

E-Tendar: Dhaka University and Bangladesh Bank started e-tendaring system. Very soon CPTU going to start e-procurement system and initially it will be introduced to some government organization pilot basis. Later it will be implemented to total government procurement system. It will reduce tendering hassle like corruption, monopoly, partiality and misuse of policy of the institutes specially government sectors. In this process tender provider will provide his all necessary information. He will also provide required product information and price details. This will increase fairness and transference of the system.

Election Commission (EC): EC has advanced in the process of automation of the Voter list of the whole country. Overall voter list is now computer based

and updating regularly. They are collecting data and update from the 64 district by direct connectivity and stored data in the central Datacenter One part of the project is National ID card. It is a great achievement in the process of the digitization and automation of the Bangladesh. It is now ongoing process and still in the immature stage. Still it is not using for dynamic purpose and not using by online (limited use). It is now providing National ID card from the datacenter. ID card using for various purposes like Passport, driving license, identity, crime detection and other facilities. But there are possibilities of the fraud as it is offline process.

We are expecting National ID card project will be mature with sufficient correction and accuracy. It will be available online (limited data) for authorize agency so that they may this database facility for others purpose. For example, still passport authority need police verification for accurate identity that is much time consuming and hassle. If passport authority has limited permission in the National ID card database, they can easily cross check the identity for passport that will save time and provide fast delivery. Similarly police, driving license authority, mobile operator, other government agency may use this database to provide prompt service delivery,

BCC Data Center: Bangladesh Computer Council organized and established a huge capacity data center. It may become central government repository for data. To use this data center need to develop more infrastructures. It should be maintained properly and connected with secretariat inter connectivity with high capacity bandwidth so that ministries and divisions may use this data center for data store and necessary transaction.

Stock Market: Dhaka Stock Exchange (DSE), Chittagong Stock Exchange (CSE) and Central Depository Bangladesh Limited (CDBL) maintaining total share market of Bangladesh. They are providing and facilitating highest service for client by using ICT. DSE provide support for end users as well as broker houses. End user may easily visit the market status in real time and even buy/sell price. Broker houses have access to direct buy and sell of the shares. CDBL connected with DSE and Broker houses to maintain financial transaction. Overall they are providing excellent services for the country. Hope very soon BO accounts holder will get direct buy and sell facility from user end.

Union ICT Center: It is very good initiative to reach the root level and facilitate support for very lower end users. Village is a very small unit and Union consists of some villages. Now every union has ICT center to help village people to use ICT services and benefited from ICT. At a time it is necessary to ensure what benefit they will get from the center and easy access for general people.

Railway Ticket: One of the government sector started earlier ticket selling automation system from Dhaka to Chittagong and Sylhet. It was started to be full automated and online among the stations to manage the blank site and maximize the selling. Sometimes it happened one station has more passengers than their allotted sites and whereas other station cannot sell half of the allotted sites. According to demand and situation sometimes it is necessary to manage the sites and maximize the benefit. So ticketing system should have central database. All stations should have real time connectivity and live access facility to central database. So that stations may generate report and observe how many sites are occupied and remain blank. As a result next station may sell rest of the sites of previous stations.

Actually it is not real time live system to manage the sites and fill up the blank sites. Every stations working as a standalone system and once upon they synchronize with the central database. A ticket seller may check the report of other stations but it is time consuming and tough. It is something like dialup system.
Now rail ticket is selling in the railway stations. For easy access, more than one advance ticket counter should be present in the different key point of Dhaka city. Now different mobile operators selling rail tickets from various service points but it is now easy and affordable. .

Passport Office: Passport office providing Machine Readable Passport (MRP). It is easy and straight forward process for people. Once it was most corrupted sector and possibility of duplicate passport. There is no scope to fraud people for money and no scope of duplicate passport. MRP is a fully most digitized system and data stored in a central server. Details information, Instant picture and finger print of individual is also included in the database. Passport office plays a vital role for the country. Special Branch of Police provides good support for investigation of individual. They also maintain a database of report and it helps passport client.

Bangladesh Police: There was no effective mechanism to verify past crime records of a criminal or a suspect, since records were kept in different offices around the country and there was no integrated system that puts all those records together and makes them accessible from any location. There was also no systematic way of recording information about criminals/suspects and crimes, that could help identify interrelationships among criminals and help analyze the nature of crime in certain areas. The process of manual verification of fingerprints was also cumbersome, lengthy and prone to human errors. Information exchange and dissemination among different police stations was also minimal.
Bangladesh Police also developed in the IT sector. They have own mail system, criminal database, remote monitoring, digitally verifying fingerprints instantly, digitally storing warrants, Special Branch has own database. Also they have different office connectivity and may share data. Police have a very rich website.

Digitized Land Management: Land disputes lead to many criminal offences in Bangladesh. The land ownership system is very complex in Bangladesh. The country has 9 million hectares of cultivable land. Moreover, inland is shrinking due to river erosion each year. The cropland is also shrinking due to human settlement. Land grabbers and land agents are constantly exploiting the mass people in a variety of ways. They prepare fake papers to deceive the poor and marginal people with the help of a section of dishonest land administration employees, often with muscle power. River erosion, population explosion, mismanagement of land administration, political nepotism, investment in unproductive segment has deteriorated the land system in the country.
Land related data entry is going on. Survey office is maintaining a database in-house. We hope, it will be published for citizen's use very soon. Develop customized application software for Imaging, Archiving, Retrieving and Printing of Khatian and Mouza Maps. Digital storage of images of all CS, SA & RS 'Khatian' records and respective CS & RS mouza maps for 3 Upazillas, namely Manikganj, Singair and Saturia. Total Khatians of those Upazillas are about 2,720 volumes containing about 2.72 lakh 'Khatian' records and 550 Mouza maps.

Hajj Office under Ministry of Religious Affairs: The Ministry of Religious Affairs has launched a website in 2002 to provide some information-based services to the pilgrims, their relatives and friends, agents and related government officials. The interactive website can be used for searching information about individual pilgrims, including current location and status, send and receive messages from individual pilgrims, for accessing various information regarding rules and regulations etc. Citizens no longer have to visit a government office to access information on the flight schedules, wellbeing, or other particulars of individual pilgrims.

Bangladesh Bank: Bangladesh Bank began to computerize its functions ahead of most other government institutions. Today it is one of the most fully computerized public institutions in the country. The following processes have been automated: export receipts; import payments; invisible receipts; invisible payments; scheduled bank advances; scheduled bank deposits; scheduled bank bills; scheduled bank debits; co-operative bank advances; co-operative bank assets/ liabilities; summary statements; central accounts of Bangladesh; loans and grants; exchange rates; monetary survey; broad money survey; salary bill of employees of Bangladesh Bank; Bangladesh Bank employees provident fund; press communiqué liquidity position, assets/ liabilities; export form matching; wage earners' remittance; secret test key development of National Credit and Commerce Bank Ltd.; secret test key development of National Bank Ltd.; and secret test key development of EXIM Bank Ltd. Bangladesh Bank has also established a dynamic, information-rich website that contains information about important macro-economic indexes and other relevant financial information. The websites updated regularly. Bangladesh Bank is using check clearing house to clear checks of all banks by using automation. Clearing house provide very fast and accurate transaction of internal banks.

Board of Investment: The Board of Investment (BOI) is the principal private investment promotion and facilitation agency of Bangladesh. BOI's present services could be categorized broadly under the following tasks: 1) Investment Promotion through publications and other means; 2) Investment Facilitation through various services for investors, such as registration, permits, infrastructure etc.; 3) policy advocacy through suggestions to the government. The BOI has one of the most sophisticated e-Government software applications in the government, which includes service tracking system that gives the most recent status of different registration processes. Many of its officers and staff are well-trained for basic computer usage.

BANBEIS under Ministry of Primary and Mass Education: The Bangladesh Bureau of Educational Information and Statistics (BANBEIS), the statistical wing of the Ministry of Education, has created a geographic information system (GIS) map-based software that provides information on density of academic institutions in particular regions, individual institution-

level data, and other useful educational statistics. This information system is being used for various policy-making purposes regarding identification of needs and more equitable distribution of resources.

Bangladesh Supreme Court: Supreme Court deals lots of cases of different type. Client may try to know the case information. Supreme Court has developed a database system that contains all cases history. Now anyone may get information of cases by SMS or going to the website by providing case type number and years. It is now hassle free and very much convenience for general people. Citizens can easily get access to cause lists and Easy access to daily important orders from the court

Bangladesh Post Office (BPO): The postal service in Bangladesh reaches citizens in remote corners where private courier and telephony services are not available. Wide-range network (10,000 post offices) and affordability are the primary characteristics of public postal services in Bangladesh. The post offices all over the country can be used effectively in delivering information and services to the rural citizens and thus reducing the digital divide. In terms of domestic money transfer, the recently inaugurated mobile money order and postal cash card service have made remittances to the rural area even easier.

7. RECOMMENDATIONS

At present Bangladesh trying to adopt ICT in all activities of government sectors specially those who delivering service to the people and maintaining coordination between government organizations. There are some lacks of the factors necessary to establish e-government. Although national leaders seem to possess the political will and commitment to adopt ICT-friendly measures to advance the IT sector and establish e-government, there are still some obstacles to overcome. These are identified and given below in respect to recommendation.

I. Lack of cooperation and coordination between government agencies and the absence of a national ICT Cell or managing Committee or central body that will provide direction to plan, design, implement, take major ICT decisions and accelerate ICT growth in Bangladesh. Similarly monitoring the progress and leakage, fulfillment requirement, proper working environment, finding obstacle and resolves, collect feedback are essential steps to move forward. This will include IT Specialists of different field as well as IT knowledgeable Administrative part. According to IBAS report (Finance Division) there are lots of project going from development fund and revenue. But project output and achievement is not satisfactory because of proper decision and monitoring.

II. To provide appropriate training in the proper level is important job for e-governance. In case of e-governance top to bottom officers should have sufficient knowledge and practical concept of IT. It will encourage them to implement and use IT in the practical field. It is essential to provide them training and knowledge based sharing. Knowledge up to a particular level should be compulsory for all officers and working staff. In the practical field they are gathering knowledge for their carrier and PATC providing training to learn public administration and other issues. Similarly IT should be included as an essential subject what is necessary for them. Similarly various organizations and countries providing local and foreign training or course especially for civil service people. All level offices are going to participate for different subject but government should encourage or guide them for IT training and education which will be helpful for e-governance. It is very easy job for government but result will be tremendous helpful for e-governance. Similarly other staffs should have necessary IT training to adapt and provide preliminary support.

III. Officers those who are taking good initiative and doing very worthy something for organization or country is not encouraged or evaluated or rewarded for his contribution. It is only possible if he is a member of particular party or group or relatives or anyhow related someone. This is an open secret, great problem in the organization of Bangladesh but it is not confessed. For anything wrong we are ready to criticize. Sometime it is called grouping or internal politics. It is one important obstacle in the way of advancement and initiatives. But for e-governance implementation, it is essential to make priority based list of officers who is advance in the IT implementation of government activities. They should be appointed for IT or e-governance related project and implementation.

IV. Proper IT professional is not available and proper job is not done in proper way. IT manpower and support is related with IT sustainability. Sometimes appropriate IT personnel are not appointed and even not available in the government policy. What type of people needed for the government offices now? Are these existing posts sufficient for present situation? Nobody thinking about these but people is recruiting for the IT field. IT appointment going on for the following positions like Assistant Programmer, Programmer, System Analyst, Senior System Analyst, and System Manager. Very rare appointed Assistant Maintenance Engineer, Maintenance Engineer. There is no post related with system and network that is essential for IT system, setup, service and support. System and Network related personnel are more essential than programming or development related personnel in the government organization. On the other hand, sometimes proper IT people are not coming in the government organization because of some problem like corrupted recruitment system and lack of hierarchy in the IT.

V. Sufficient infrastructure to support e-governance initiatives does not exist in government departments. The required connectivity network and communication equipment is either nonexistent in government departments or if exists it does not serve any tangible purpose as far the requirement of e-governance project is concerned. Different government offices including some ministries still have a largely inadequate number of working computers. Inter-offices connectivity is not planned and installed. LAN is not planed and installed properly. Installed LAN not covered all computer and printer points. Government offices not maintaining servers that is necessary. Routing and switching is not planned properly. Most of the cases dependent on vendor support. The number of offices having their computers connected to the internet is increasing but not adequate at all. Proper security and system is not maintained for internet connectivity. It is also true that a number of government offices have computers that remain almost completely unused due to lack of integrated planning.

It is found very important government offices suffering from frequent power failure where people are waiting for services for hours. It is necessary identify government sectors and offices to provide special power line for continuous power on priority basis.

VI. It is true that there has been an effort to introduce e-governance in a limited range in the ministries by supplying computers, networking, and internet. But this provides little encouragement in the ICT growth of Bangladesh. Deficiency of thinking to provide technical support and appropriate IT professionals as well as unsustainability lead to failure of the target in the government sector. In the government sector IT support and maintenance is very poor.

VII. The ministries and divisions are trying to provide current information of government activities electronically on the web. Now a day's 95% government organization or individual agencies are maintaining web site. But most of the websites are not regularly updating information and data. One of the major problem government organization is not maintaining website by own and even they are not enough careful about the website security and update. It is maintaining by vendor or others by contact basis.

Domain name is a unique name identity of an organization and it should have standard format that known to all. Domain name is used for respective websites and email addresses of the organization. There is no unique format of domain name of government organizations. On the other hand, there are dissimilarities in the main ministry domain name and respective division's domain name. Different domain name is using different divisions of this ministry individually. Sub-domain concept is very helpful in this regard. It is also very useful for email identification. Another major problem is ownership or control of the domain, hosting and update.

VIII. Government procurement system and hiring of experts is systematic steps and time consuming system. Because of more systematic most of the time it is not fair and transparent. So required goods and necessary peoples are not coming in the government system. Sometimes it is going to worst instead of better system.

IX. Internet access is too expensive in Bangladesh compared to developed countries. In Bangladesh, the lowest cost to gain Internet access is 1000/- taka per month through broadband, using modem, WiMAX

system, and mobile telecom operator. Installation of necessary telecommunication facilities for internet connection is also at the finishing stage and the country is still not under the full BTCL telecommunication network. Comparatively BTCL providing good network infrastructure and connectivity but support especially user end support is very poor stage. Rest of the area is covering by mobile network.

X. The tendency of both ruling and opposition parties to politicize everything in Bangladesh has had an adverse effect on the desired growth of ICT initiatives at both the public and private level. As political power changes hands between the two major parties in Bangladesh, the bitter rivalry between the BNP and AL often results in the abandonment of policies pursued by the previous government. This feature of the country's political culture has stymied efforts to promote the IT sector in Bangladesh.

CONCLUSION

Bangladesh has joined the race toward adopting e-government. This study examines that effort by addressing the status of ICT in Bangladesh. It analyzes the initiatives of the Bangladesh government, existing situation of Bangladesh, lack of initiatives, commitment of political leadership, and the enthusiasm of private entrepreneurs to introduce e-government in Bangladesh. It concludes that e-government preparation in Bangladesh is still in its primary stages and has not fulfilled its potential due to technical, infrastructural and political obstacles. A coordinated effort of political leadership, bureaucrats, and private entrepreneurs could facilitate the desired development in the ICT sector and accelerate the presence of e-government in Bangladesh.

Although all of the confusion and frustration associated with ICT initiatives in Bangladesh, e-government is becoming a fact in the daily lives of the citizens of the country. Perhaps progress is slow and there is confusion about the means to achieve this, but there is no doubt about the goal of attaining e-government. A coordinated effort by political leaders, bureaucrats, and private entrepreneurs is critical to facilitate the growth of the ICT sector and the socioeconomic development of Bangladesh. A country's social, political, and economic composition correlates closely with its e-government program development. Key factors such as the status of a country's telecommunications infrastructure, the strength of its human capital, the political will and commitment of its national leadership and shifting administrative priorities influence how decision makers, policy planners and public sector managers elect to approach, develop, and implement e-government programs.

Bangladesh is primary stage of the e-governance. Ministries are not in a point whatever necessary except few ministries. Even it is not in expected level. It is found other than ministries like some divisions and directorates are improved and advanced than ministries. Domain name should have unique format of all ministries and division or directorate should use sub-domain of the respective ministry.

Now a day e-governance is essential criteria for a country. Still we are working with manual system and file moving from one table to another table. Just to move one table to another table takes sometimes months. In absence of e-governance a country is like a lame man who is always trying to survive with his troubled arms. Day by day e-governance is knocking the door of the country to transform all old manual activities to new automation system.

E-governance is a demand of time that will provide people prompt, easy and transparent services. E-governance will also lead to improve and progress a nation very significantly. So if it possible to implement full e-governance that will help to reduce poverty and corruption. This will help Bangladesh to improve much more.

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Appendix A.

Ministry/ Division	Computer Equipped	LAN	Internet	Office e-mail	E-mail usage %	Secure ID	Share printer	Data backup	Virus protection	ICT Document	Website	Website Updated	Website Manipulation	Web Info	Data center	IT Support	E-calendar	Application	Security/ protection
Agriculture	√	√	√	√	0						√	√			√	√		√	
Armed Forces	√	√	√	√					√		√	√							
B & F Div	√	√	√	√	80	√	√	√	√						√	√	√	√	√
Cabinet	√	√	√	√			√				√				√	√			√
Civil Avia & touris	√	√	√	√			√				√					√			√
Commerce	√	√	√								√				√				
Ctg. Hill Tracts	√	√	√	√		√	√	√			√								
Cultural Affairs	√	√	√						√		√								
Defense	√	√	√	√				√	√		√								√
Education	√	√	√	√	20				√		√	√			√	√		√	
Energy & Power	√	√	√	√	5				√		√	√							
Environ & Forest	√	√	√	√	50				√		√	√				√			
ERD	√	√	√	√	10	√			√		√					√			√
Establishment	√	√	√	√	10		√	√	√		√	√	√	√	√	√		√	√
Expatriates	√	√	√								√								
Finance	√	√	√	√	90	√	√	√	√	√	√	√			√	√	√	√	√
Fisheries & Livest	√	√	√				√		√	√	√	√			√	√		√	
Food Division	√	√	√	√				√			√								
Foreign Affairs	√	√	√	√			√	√	√		√								√
Health	√	√	√	√	5				√		√							√	
Home	√	√	√	√					√		√								
Public Works	√	√	√	√					√		√								
IMED	√	√	√	√							√				√				
Industries	√	√	√								√								
Information	√	√	√								√								
IRD	√	√	√								√								
Jute	√	√	√								√								
Labor & Employ	√	√	√								√	√							
Land	√	√	√	√			√				√								
Law & Justice	√	√	√	√			√				√	√							
LGD	√	√	√	√			√				√	√							
Liberation War	√	√	√				√				√								
Planning	√	√	√	√			√		√		√	√				√			√
Post & Telecom	√	√	√	√	20						√	√							
Power Division	√	√	√	√	2				√		√								
Primary & Mass	√	√	√						√		√								
Religious	√	√	√						√		√								
Roads and Rail	√	√	√	√	50		√	√	√		√	√			√	√		√	√
Rural Dev & Cooperative	√	√	√	√			√				√	√							
Shipping	√	√	√	√			√				√	√							
Science	√	√	√	√	10				√		√					√			√
Social Welfare	√	√	√								√						√		
Statistics	√	√	√	√			√				√	√							
Supreme Court	√	√	√								√	√							
Textiles & Jute	√	√	√								√	√							
Water Resources	√	√	√						√		√								
Women & Children	√	√	√								√	√							
Youth and Sports	√	√	√								√								
Bangladesh Police	√	√	√	√		√					√	√							
Average Percentage	100	100	100	70	10	10	32	18	50	0	100	42		2	20	28	4	16	22