

Improved Information Systems Model for Bangladesh

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Abstract

In the era of globalization, implementation of e-Government (e-Gov) is very crucial because it modernizes the public and private sector for the well being of people. To build the electronic based automatic governance for improving the quality of public services is the prime measure for implementation of e-Governance in Bangladesh. Interoperability is a key issue in implementing an e-Government system. To create a general platform for sharing and exchanging information among different institutions is essential for interoperability. Grid Computing based service could be a solution for resource sharing and interoperability of e-Gov systems. It is important to prepare standard policies and guidelines for e-Governance so that the desired expectations of interoperability between central and local government agencies can be achieved. Bangladesh government needs a specific policy which will deal with interoperability and ensure transparency and accountability in the Grid Computing Model.

Keywords: transparency, cooperation, information system, automation, e-Gov & grid services

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1. Introduction

The implementation of information and communication technology (ICT) is aimed for strengthening democracy by political reform which will ensure people's participation in the decision making process. It helps government to make service and goal oriented management for transparency, liability, accountability, efficiency and effectiveness for establishing public policies in order to response the community aspiration. The main motto of implementation of ICT in governance is to establish participatory, trustworthy, service oriented and transparent governance so that people can get the benefits of democracy and justice. Good governance ensures political, social and economical priorities which are based on board agreement in society where the voices of the poorest and the most vulnerable are heard in decision making over the distribution of development resources [1]. The public management reform is influenced by management progress of ICT, called e-Government (e-Gov) [2]. E-Government is the use of ICT which brings rapidness and dynamism in governmental activities so that people can get proper services from different institutions of government.

2. Government Systems in Bangladesh

The central government of Bangladesh is basically parliamentarian government that has a supreme powerful Prime Minister (PM) with a team of minister and member of parliaments (MP) and one president who is elected by the parliament of the government according to the constitute of the People's Republic of Bangladesh. The centralized governmental system is used in Bangladesh [3]. The structure of the governmental system of Bangladesh is shown in Figure 1. The government conducts the government affairs by keeping close contact with the local government which includes the authority relationship, finance, public services, resource utilization and regional planning and development.

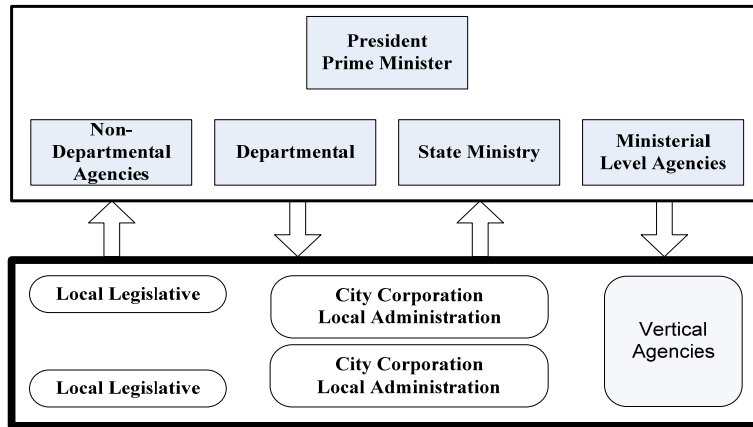


Figure 1. The Structure of the Governmental Systems in Bangladesh

2.1. Hierarchy of Local Government in Bangladesh

Bangladesh has a unitary form of government. For the convenience of administration, the country is divided into seven administrative divisions and each division is subdivided into districts. The rural/regional local government as proposed by the latest commission on local government would have eight tiers as in Table 1 [4]. Urban areas have a separate set of local governments. The nine largest cities have a city corporation or municipalities, which again are classified according to financial strength as in Table 2 [4].

Table 1. Demographical Statistics of Bangladesh

Region	Statistics
Divisions	7
Districts	64
Upazilla	500
Administrative Thana	509
City Corporation	9
Municipalities	309
Thana	599
Union	4,498

Table 2. Hierarchy of Local Governments in Bangladesh

Area	Statistics
City Corporation	Nine Cities
Pourashavas, Municipalities	309
Category	Annual income level
Class I Pourashavas	Over 6 million
Class II Pourashavas	2 million
Class III Pourashavas	Less than 2.5 million

2.2. Functions of Local Government in Bangladesh

E-Government services can be utilized based on the functions type of different levels of local government bodies, architecture of e-Government framework. The functions of the Gram Parishads, Union Parishad, Thana/Upozila Parishads and Zila (district) Parishads are elaborate and include amongst other optional function [4]. The Gram Parishad functions include:

- a) Conducting socio-economic surveys of households, every five years to be used for development plan preparation;

- b) Maintain vital statistics like registration of births, deaths, marriage, etc.;
- c) Supervise management of primary educational institutes;
- d) Create awareness for better primary health care;
- e) Maintain law and order and control terrorism, violence against women, etc.;

The Mandatory functions of urban local government are as follows:

- a) Construction and maintenance of roads, bridges and culverts;
- b) Provision and regulation of water supply;
- c) Regulation of insanitary buildings & prevention of infectious diseases & epidemics;
- d) Control over the construction and reconstruction of buildings;
- e) Control over traffic and public vehicles.

The Optional functions of urban local government are as follows:

- a) Checking adulteration of food products;
- b) Control over private markets;
- c) Maintenance of educational institutions & provision of stipends to talented students.
- d) Establishment of veterinary hospitals, registration of cattle sale and improvement of livestock;
- e) Naming of roads and numbering of houses.

2.3. E-Government in Bangladesh

In Bangladesh, e-Government is needed for supporting the democratic governance practices and the application of authority balance of the central government with the local government. E-Government is also needed to facilitate coordination between central and local government for transparent and liable democratic system for successful implementation. The policies and goals of e-Government should be publicized to government and non-government organizations. The public administration is one of the areas in which internet can be used to provide basic services to citizens according to the requirements [5]. This will be helpful for implementing national policy and strategy for e-Governance. To build the electronic based automatic governance for improving the quality of public services is the prime measure for implementation of e-Governance in Bangladesh. The e-Governance development means the improvement of management systems and work processes within the governmental agencies by utilization of ICT [6]. It is important to prepare standard policies and guidelines for e-Governance so that the desired expectations of interoperability between central and local government agencies can be achieved [7]. The factors to be considered for developing e-Governance in Bangladesh are:

- a) Develop vision and mission for developing basic platform for e- Governance.
- b) Design infrastructures for implementation of e-Governance.
- c) Cooperation and collaboration among political parties for implementation of policies and democracy.
- d) Coordination and sharing of information among central and local government.
- e) To overcome the complexity, overpopulation, corruptions and for security Dhaka city should have declare a special region and everybody should have a city e-card.
- f) Need Automatic Recognition Systems (ARS) and put it on database for transparency. The e-card system for city dwellers can be implemented in order to ensure security and reduce overpopulation of megacities like Dhaka.

The benefit gained from e-Government is not only providing online service for sharing information but also it brings rapidness and cleanness in socio-economic developments of a country. In the era of globalization, the implementation of e-Government is very crucial because it modernizes the public and private sector for the well being of people. From the perspective of transparency and better public service e-governance is essential in Bangladesh. Various organizational structure and work procedures are followed by different agencies of government in Bangladesh. Moreover different organizational structure exists in different sub departments within one public organization. Therefore organizational reform is necessary both in public and private sector before implementation of e-governance. The utilization of ICT in all public and private organization will bring the whole country in a common technological platform which will ensure the basic requirement of e-governance. Building infrastructure, realistic planning and proper implementation are the key components for developing public services portal for information management and processing [8]. Based on strategic plan of the State Ministry of

Communication and Information, there are some strategic plans to develop e-Government as follows:

- a) To develop, extend and improve the quality of ICT network, to build the information portals and integrated public services, to build the e-documentation management system and standardization of information security system.
- b) To develop efficient management system in central and local government that will improve the quality of services needed by community.
- c) To optimize the use of ICT for establishing the interoperability, standardization and procedure of e-document management systems, information security, basic application (e-Billing, e-Tendering, e-Learning, video conferencing, e-Reporting, e-Banking, e-Tax & Vat), ARS with barcodes and to develop inter government recognition pattern networks.
- d) To improve the participation of private sector and ICT industry for establishing e-governance, focuses are to use the expertise of the private sector, to encourage participation of private sector and small industries.
- e) To develop the skilled manpower in the central and local government, the objectives are to develop the ICT culture in government institutions, to optimize the use of ICT training facilities, to extend the use of ICT for distant learning and to include ICT in school curriculum and to improve the quality of teaching, monitoring and evaluation by automatic recognition methods.
- f) National Identification (NID) card number should be linked up in every organization.

2.4. E-Government Interoperability

Interoperability is defined as system ability to share and integrate information and work processes using a set of standards. It is the ability of diverse systems and organizations to work together. To create a general platform for sharing and exchanging information among different institutions is essential for interoperability. The Grid computing technology can be the solution to the interoperability. Bangladesh government needs a specific policy which deals with this interoperability. The approaches for e-Government interoperability are based on cross-organizational workflow and semantic web or semantic driven [9-15]. Service Grid [16], a kind of combination of Grid computing [17] and service oriented architecture (SOA) technology, open up a new way for cross-organizational resources integrating and collaboration in e-Government. Service Grid technologies can be used to build the platform for resource sharing in e-Government systems and also bring new feature for better reusability, flexibility and scalability. Yang, et al, [14] proposed a service Grid based framework as in Figure 2 for Shanghai e-Government interoperability, named e-Government Grid, which targets at facilitating among “horizontal” organizations and interoperability among “vertical” e-Government subsystems. Here “horizontal” means cross organizational applications and “vertical” means information system within one organization.

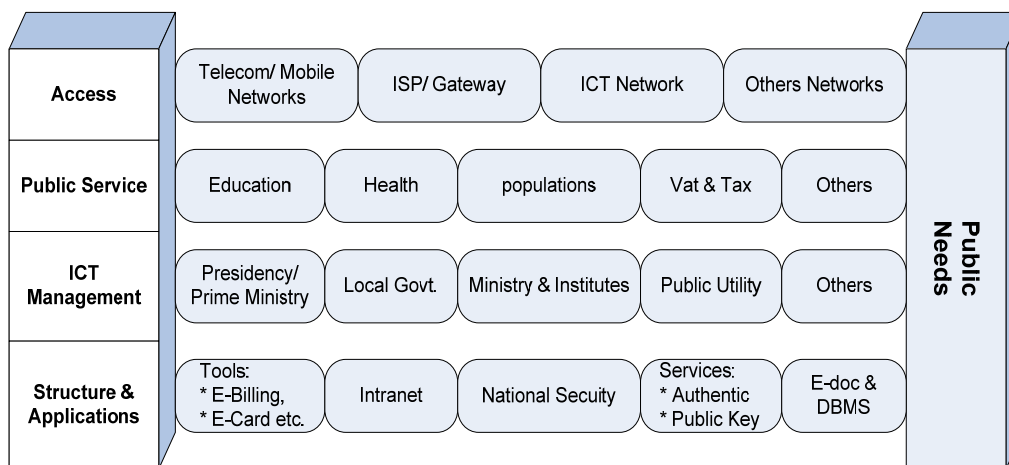


Figure 2. E-Government Architecture Framework

3. Concept of Grid Computing Services

The word “Grid” comes from the Electricity Grid which is an electronic device plugged into the Grid that will acquire the same resources regardless where that source took place. Grid computing is a new information technology architecture that produces low cost enterprise information systems and more able to adapt to business dynamics. Grid middleware is used to bring a various number of resources of Grid computing. Middleware is a set of software that manages resource so that accessible to clients without having to know the configuration. There are several other levels to configure Grid computing architecture such as local resource manager, core middleware, application development and development environment [13]. The traditional pattern “Information Centre” adopts centralized data storage, which cannot easily adapt to an open e-Government environment due to non real time update and high costs for management and maintenance of centralized data. The web services provide a loosely coupled mechanism to encapsulate resources with standardized interfaces for using web services without manage and maintain resources behind a web services. The system supports the Grid community through Grid middleware based on multiagent systems. Grid Manager manages the Grid community that consists of legacy systems with different DataBases (DB). The system architecture would be act as an intelligent approach for monitoring [18].

4. Model of E-Government Automation and Grid Computing Services

The initial e-Government Grid Service Model in Bangladesh is an improvement of Grid Shanghai Model [15]. The Grid has resolved the problem of information sharing by using data structure, databases, computational resources, storage resources and other information using open standard protocols. The open source is used to meet the requirement of the e-Government that have already designed a set of middleware to support the e-Government applications for cost reduction and full utilization of IT (Information Technology) resources existing within the government. The institutional power of Bangladesh government is concentrated in the central government with regional autonomy. The division of tasks and responsibilities between the central and local government is conducted by the constitutional decree. The function application of the e-Government framework of Bangladesh is divided into three subgroups according to service types of e-Government based on user orientation. The Grid services is placed on service layer that enables resource sharing and interoperability among group functions where service repositories will serve as a virtual resource pool and runtime environment for discovery and invoking services.

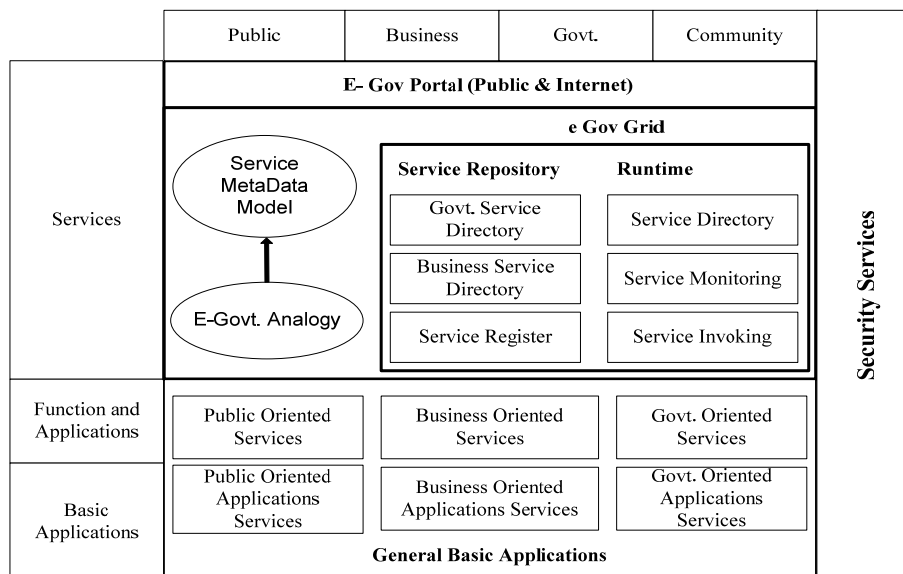


Figure 3. Initial e-Government Grid Services Model in Bangladesh

The difference with Yang, et al, [14] is the overall architecture of e-Government which requires more complex framework for a country like Bangladesh. In Figure 3 the physical resource layer is decomposed into two layers of basic application and function application. The latter is divided into public, business and government oriented services. This layer division is helpful for the process of resources sharing among government agencies which is more specific depending on the services to be provided.

Being a developing country Bangladesh requires major infrastructure development in order to initiate e-Government. The separation of basic application and function application will make the interoperability processes easier because specific services are classified into clusters [19]. The division of the application also influences the gradual and individual development of Grid services of e-Government. The government needs to decentralize all public sectors and it is necessary to connect all governmental and non-governmental enterprises to connect with the Grid for digitalization. All the sectors within the Grid should follow automatic and online systematic connection which will function like the Figure 4. The automatic detection and Recognition system with Frequency Identifications needs to be implemented for rapidness of work with the government which will ensure transparency. All services and systems need to be integrated for all networks to improve the information systems [20].

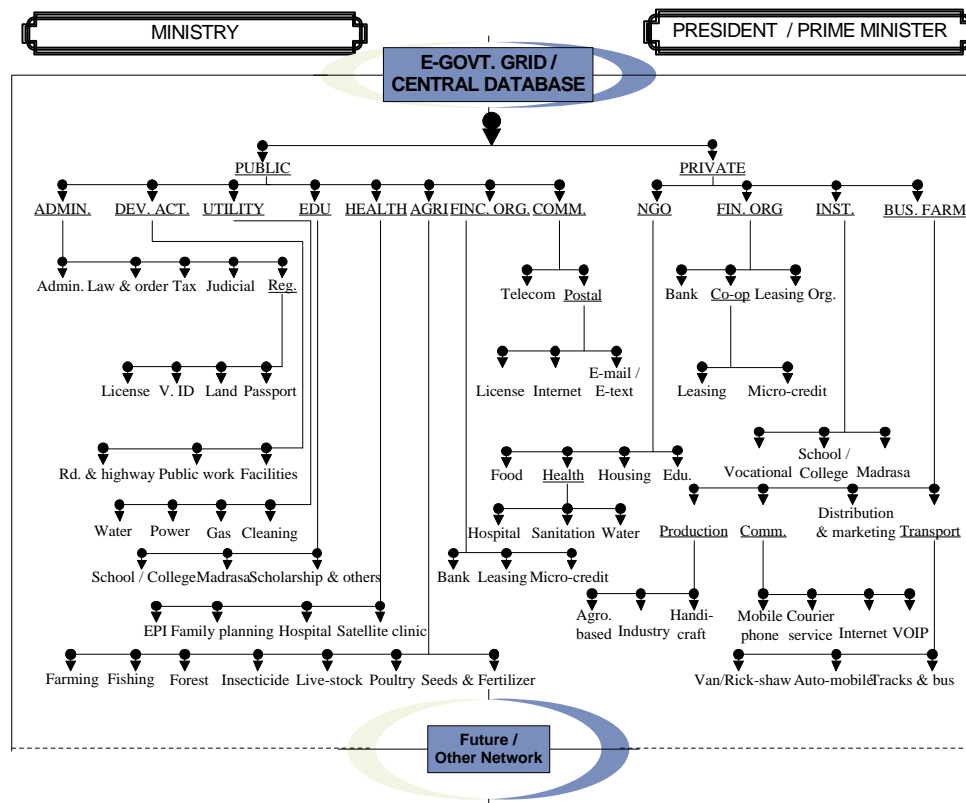


Figure 4. E-Government Grid Services & ICT Model for Bangladesh

5. Conclusion

The e-Government is the usage of information technology for improving the services and policies of public sector which will lead to the organizational change for providing quality services to the people in a participatory democratic environment. The implementation of e-Government Grid services in Bangladesh is facing challenges like traditional bureaucratic political system, corruption, lack of infrastructure, political unrest, lack of organized information, mismanagement and undemocratic practice in public sector and lack of knowledge sharing. The proper training on planning and technological aspects of e-Government Grid services is required for employees and policy makers of both public and private organizations for successful

implementation of e-Government. Due to rapid change of technological world, it is also required to upgrade the organizational system and skill of manpower for managing and handling the overall e-Government Grid services in Bangladesh. The government needs to decentralize all public sectors and it is necessary to connect all governmental and non-governmental enterprises to connect with the Grid for digitalization. All services and systems need to be integrated for all networks to improve the information systems and all the sectors within the Grid should follow automatic and online systematic connection. The automatic detection and Recognition system with Frequency Identifications needs to be implemented for rapidness of work with the government which will ensure transparency. There should be standard legal foundation for using internet services for avoiding cyber crime with the e-Government Grid system.

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