Transforming Public Service Delivery Through E-Governance: Policy Analysis And Future Direction For Digital Bangladesh

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Abstract

In the developing world, e-governance is a revolutionary vehicle for improving service delivery and governance. E-governance, based on the worldwide digital transformation trend, employs information and Communication technology (ICT) to enhance public administration's productivity, transparency, accountability, and democracy. Bangladesh has a strong legislative foundation for digital governance, dating back to 2009 with the adoption of the "Digital Bangladesh" vision. There have been some improvements in modern service delivery methods and a lowering of bureaucratic rigidities through significant initiatives, such as the National ICT Policy 2018, the Access to Information (a2i) programed, Union Digital Centers (UDCs), e-Government Procurement (e-GP), and e-Filing (Nothi). Such efforts have led to a decrease in corruption, increased participation among people, and the introduction of participatory governance. Challenges remain. Despite significant strides, the need for equitable access to services remains a challenge, especially in remote rural areas where infrastructure and digital literacy are still lacking. Interoperability, cybersecurity, and institutional coordination are also hindering the seamless delivery of digital services. Policy gaps, including the absence of measurable performance indicators and weak enforcement, also impede progress. Based on comparative experience with international best practices, policies need to be updated constantly to respond to emerging technologies, such as cloud computing, blockchain, and artificial intelligence. This paper discusses and analyzes the policy frameworks that underpin e-governance in Bangladesh, along with their implications for enhanced public service delivery. The study contributes to a deeper understanding of policy-initiated e-governance for inclusive, secure, and citizen-focused service systems by examining its pros and cons, as well as identifying opportunities for improvement, more closely. Ultimately, the findings underscore the importance of creating coherent policies that can help transform Bangladesh towards a sustainable digital governance path.

Keywords: *e-Governance, e-Government, Digital Bangladesh, ICT in Governance, Smart Government, Public Sector Innovation, G2C G2B G2G Services, Union Digital Centers, e-Filing System, e-GP Procurement, Open Data Portal, MyGov App, Digital Service Delivery, Digital Literacy, Cybersecurity in Public Sector, Blockchain in Governance, Cloud Computing, Citizen Participation, Transparency, Accountability*

I. Introduction

Electronic governance (e-governance) is the use of information and communication technology (ICT) for delivering government services to citizens, businesses and other government entities in a digital way (Iyer & Rao, 2017; Joseph, 2017; Heeks, 2004; Gupta & Jana, 2003). E-governments consists of strategies and plans that utilize distributed, networked individuals and digital machinery to enhance effective delivery of government services. There have been some successful e-governance from the1970s, and both developed countries and developing those are coming to a new growth level of implementing e-gov. Yet the difference of the growth results between two groups of countries are vast (Liu et al., 2017). Even with the present circumstances, developed nations are way ahead of developing countries (OECD, 2015; WEF, 2016). But in developing countries, it is reducing (Berrío-Zapata and Berrío Gil, 2017).

In countries like Bangladesh, where traditional service delivery models have been ineffective due to bureaucratic redtapism in bureaucracy, corruption and lack of accessibility for decades, e-governance provides a new way to public administration. Originating from the wide international trend to implement digital governance, E government is the use of information and communication technologies (ICT) by a government to better the

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services it delivers to citizens, businesses, society itself and other governmental agencies. Use of ICT in governance systems in Bangladesh has been largely driven by the launch of the vision "Digital Bangladesh" since 2009 and envisioned to make a visible impact on enhancing access, transparency, accountability, efficiency and participatory nature of public service delivery.

Among many reasons, the emergence of e-governance in Bangladesh can be attributed to the fast increases of ICT facilities and tools nationwide, extensive usage of Internet activities, widening expectations by the public for improved facility and service from the government. The delivery of citizen-centered digital services is also being supported by programs like the Access to Information (A2I) programmed, which is financed by development partners such as USAID and UNDP. As of today there are more than 8,800 Union Digital Centers (UDCs), which work as citizens' service delivery points to deliver variety types of services including: utility bill payments, application for passport, access to land records and birth registration. The level at which government work has been digitized is truly amazing and the risk of corruption has been further minimized by way of various entry barriers like e-filing (Nothi), e-passport and electronic government procurement (e-GP) system.

In Bangladesh, e-government is constructed upon a layered model that consists of infrastructure, common digital services, legislative instruments, and portals to engage the citizens. To mainstream digital transformation in public sector ministries, the government has issued various policies including, among others, the National ICT Policy 2018. The overarching goals of these initiatives are to make businesses more competitive, lives easier for citizens and drive up the level of innovation in governance processes. At the operational level, e-governance measures like the Grievance Redress System and online consultation platforms seek to minimize transaction costs, alleviate bureaucratic hurdles, and facilitate citizen involvement in decision making.

But there are hindrances in the path of full-fledged and inclusive functioning of e-governance. Poor infrastructure, especially in rural or remote areas, obstructs citizens' equal access to digital services. Digital illiteracy is one of the major barriers for many people to use online services, especially in poor communities. Issues related to Data Privacy, Cybersecurity, and Interoperability with Digital Systems also have to be addressed in order for the public trust on the digital transformation processes.? The institutional coordination among the ministries and agencies is also necessary to avoid efforts from becoming fragmented and duplicated.

The paper focuses on the history, legal architecture, and strategies of realization for e-governance in Bangladesh and assesses its successes as well as shortcomings and prospects. It provides an outline of how technology is transforming the delivery of public services and by focusing on significant programs, institutional arrangements, as well as legal norms that define the country's digital governance scenario gives you a complete understanding.

Rational of the Study

Bangladesh is a developing country and has advanced significantly in digital transformation for better citizen engagement, governance and service delivery. But if technology has to be used for an administrative process so that functions can be performed almost without human intervention, a clear policy framework is the central theme of e-governance which includes aspects such as cyber-security, technology backbone, digital infrastructure or access and availability of services anywhere and anytime and lastly, awareness among citizens. E-government has become a powerful means for improving efficiency, accountability, and transparency of public administration in the age of digital era. This research intends to evaluate Bangladesh's current e-governance policies and propose a fit-for-purpose framework in accordance with global best practices and national contexts in terms of institutional and socioeconomic status. Focusing attention on problems in existing governance frameworks and fresh models of digital governance, this essay will help those interested in the development of new modes of public service to appraise the organization and accessibility of the new forms. It is also expected that the study would shed light on the potential of new age technologies like blockchain, artificial intelligence and cloud computing to strengthen governance configurations. Taking up the issues of data security, interoperability and public trust in this framework we will support the inclusive growth as well as the sustainability of e-governance in Bangladesh. In consonance with that, this research is basically designed to promote a technology mediated and citizen centric mode of governance, which complements the vision of government for "Digital Bangladesh".

Objective of the Study

- To analyze the current status and development of e-governance initiatives in Bangladesh. and examine the policies, legal frameworks, and institutional mechanisms that support e-governance.
- To assess the effectiveness of digital technologies in improving transparency, accountability, and efficiency of government services.
- To describe major challenges and barriers e-governance plans at different levels of administration.
- To suggest policy recommendations to enhance strong e-governance and inclusive, safe and citizen-centric digital public services in Bangladesh.

Research Question
- What are the available policy guidelines for e-governance in Bangladesh?
- How efficient are the existing e-Governance policies in facilitating transparency and effectiveness in delivery of public service?
- What are the obstacles government agencies encounter in applying digital technologies to the provision of public services in Bangladesh?
- How widely do rural and urban citizens have access to and experience the potential of e-governance?
- How can the policy environment be better designed to promote more inclusive, secure, and user-friendly digital public services?
- How much do data privacy and cybersecurity policies matter in relation to the concept of digital Bangladesh?
- What is the role of citizens and public officials digital literacy in the success of e-governance projects?
- What are the lessons that could be learnt from other countries for improving Bangladesh's e-governance policy framework?
- How do policy settings facilitate collaboration across agencies and ensure compatibility of digital platforms?
- Which are the systems to assess the performance and effectiveness of e-governance in Bangladesh?

Scope of the Study
The present study examines some e-governance programs that have been undertaken in "Digital Bangladesh" perspective vis-à-vis national portal, UDC, e-filing system and reflection on the ongoing progress of e-GP. It examines the way that institutional design, legislation and ICT policy have all contributed to the development of digital governance.

Limitations of the Study
- The study depends on official reports and secondary data that are readily available, which might not reflect the most recent advancements.
- Understanding of localized challenges may be limited by a lack of primary field data from marginalized and rural communities.
- Changes in policies and technology during the study period may have influenced the results.

Methods of Research
The current status, policies, implementation strategies and challenges for e-Governance in Bangladesh are analyzed in this paper using qualitative research methodology. To generate a good understanding of the depth and complexity of the nation's digital governance ecosystem, this approach involves a meticulous descriptive analysis as well an interpretive review of the corpus of existing literature, policy papers and official documents.

Design of Research
Hence, the design of the current study is descriptive and exploratory. While the descriptive part offers a systematic overview of existing state-of-affairs in terms of frameworks, institutional mechanisms and best practices, the exploratory one aims to map the area by identifying both e-governance initiatives drivers and limits. It is independent of statistical calibration and may be applied to policy-driven changes in governance.

Sources of Data
My research employs solely secondary data collected from:
- Official Government Policy documents including National ICT Policy 2018; Digital Bangladesh Vision 2021, and e-Government Master Plan reports etc.
- Published Literature "Institutional" documents include publications by institutions and agencies in Bangladesh such as bdjobs, the Bangladesh Telecommunication Regulatory Commission (BTRC), the Access to Information Program (a2i), and the Bangladesh Computer Council (BCC).
- Reports and suggestions on e-governance by international bodies including the World Bank, OECD and UN.
- Book chapters, conference papers and journal articles that deal with comparative case studies, policy implementation and e-governance frameworks.
- Trusted news stories and on-line resources that provide current views on ICT policy progress and digital service provision.

Method of Data Collection
This review is to collect relevant information by documentaries technique. This involves systematically identifying relevant documents to address the research questions of the study. Policy/strategy papers, legal

frameworks and institutional project descriptions are studied to identify key themes. Thanks to a meticulous selection only reliable and up-to-date sources were integrated.

Method of Data Analysis
Through the adherence to a structure of analysis, the collected materials are categorized into central themes such as:
• Governance structures and policy frameworks.
• Model for Service Delivery and Digital Infrastructure.
• Inter-agency coordination and institutional mechanisms.
• Themes such as cybersecurity risks, infrastructure disparities and digital literacy gaps.
• Study of e-governance experiences in other countries.

Ethical Considerations
　　　　Careful academic and ethical principles are adhered to in this study. All the secondary sources used are correctly reported, with respect for intellectual property rights. Issues of informed consent and confidentiality do not arise, as there is no contact with human subjects. The presentation of research findings is characterized by integrity, transparency, and objectivity.

II.　　Literature Review

　　　　Civil service reform and good governance in Bangladesh have the potential to be enhanced by e-governance (influenced by 'Digital Bangladesh' vision) that affect citizen's participation, transparency, accountability etc., possibly increasing satisfaction of user (Ahmed et al., 2020; Kamruzzaman & Ahmed, 2017; Khan & Alam, 2012). During the last four decades, Bangladesh pursued a remarkable success in IT utilization especially over the last decade that resulted in a drastic increase of internet usage and popularization of technology (Rashid, 2022). This technology leap has given birth to various e-governance initiatives which are designed to bring governance closer to the governed (Mishra & Mishra, 2012; Basu, 2004). A variety of e-government services are offered from simple to sophisticated, including G2C (Gov to Citizen), G2B (Gov to Business), G2G (Gov to Government), and G2E (Gov To Employee) services (Mundia, 2016). There is still challenge in terms of infrastructure, manpower expertise, public knowledge and inclusivity among factors that could hamper proper implementation despite the success so far recorded (Ahmed, 2018). But against all odds, e-governance has played a vital role in Responding to emergencies such as the outbreak of COVID-19, and thus showed its powerful position in reshaping public service delivery and government in Bangladesh (Islam et al., 2020; The World Bank, 2023a). These issues are needed to be addressed in order to achieve sustainable and fruitful outcomes from e-governance practices.

E-governance Definitions
　　　　Furthermore, advancing ICTs in all spheres of life, have compelled governments to take measures toward implementation of e-government systems, notably the developments in private sector who have further endorsed ICTs and placed public sector under some pressure. The E- Government philosophy means the application of information technologies (like internet, mobile computing and wide area network) by the government to effect its relationships with business, citizens and other agencies of government (Alshehri et al., 2012). As such, government services can be delivered in different ways including retailers, e-portals, banks, governments and other sectors (Sarrayrih & Sriram, 2014).

　　　　E-government has been defined as "government uses of information and communication technologies (ICTs) for citizens and business partners to interact, transact or access the information" through different electronic means such as telephone touch pad, fax machine, smart card, self-service kiosks, e-mail/Internet, and Electronic Data Interchange (EDI)" (Almarabeh & AbuAli 2010).

　　　　Additionally, the United Nation's, (2018) articulated it as "The use of information and communication technologies
(ICT) – including Wide Area Networks, the Internet and mobile computing – by government departments.

　　　　E-Governance is the use of ICT for providing information service, improving accesses to government services, exchange between G2C, and G2B any category stakeholders along with G2G as well as back office processes and relations from whole-of-government approach (Saugata & Masud, 2007).

　　　　As definition given by UNESCO (online), E-Governance is the use by the government for public sector information and communication technologies to better exchange of information and services, it seeks to promote more efficient delivery of these services on a timely satisfactory basis, improve processes of governance such that they are more accountable, transparent and responsive. Online services can be described as the electric delivery of services to consumers (Saanen, Sol & Verbraeck 1999).

E-governance The initiatives of e-governance can be measured in four dimensions: i) E-services – Use on interaction with the citizens to make government information and services available electronically. public. ii) E-file management- Business Process and decision making in Government using e-File system. iii) E-participation -Here in people participate for reaching consensus through on-line forums, video and voice conferencing, e-mail and website mail (Cook et. 2002 in Kabir and Baniamin 2011).

So, E-Governance is the application of ICT-IT in the government way at the office for electronic decision making system, to hold and storage a records in electronic database system and is delivering government information or service by using best information technology to public in electronic mode with utilization through internet (www), Email, cell phone, fixed phone so on.

The literature on 'e-governance' is miserably lopsided with the presence of the term e-government and that is no surprise at all. These two words, I submit have enormous linkage even they are not the same. It is a narrower concept compared to the second, which embodies change in the functions of government adopted to be led primarily by ICT. The center of attention in the concept e-government is mainly at the improvement of administrative procedures for more effectiveness and efficiency in first place and some online services to citizens in second place (Backus, 2001).

Classification of e-governance

E-governance on the other hand is not restricted to DRV, and goes through transformation at four levels or more. First, it is about the revolution in the business of government (e-gov). Secondly, there is a change in the operational definitions of principles that underpin governance away from autarchy to participation, openness, transparency and communication (Schiavo-Ocampo & Sundaram, 2001). Thirdly, it concerns a transformation of relationships government has with its clients (internal or external) labelled as G2C, G2B, internal employee clients called G2E and C2C on an international scale and intergovernmental contacts such as those between the UNPA Institute and nation-States. Finally, it includes a shift of the society itself, thanks to the arising of relationships and relations between (NGOs), established and kept by electronic content (Pablo & Pan: 2002).

Figure 2.1: Classification of e-governance
Source: (Taifur, 2006 and Valentina, 2004)

G2C (Government-to-Citizen): Interaction between the government and individual citizens. G2C enables government organizations do to talk, listen, engage (relate) and keep informed (communicate) with its citizens promoting all this in the spirit of accountability, democracy and better public services. G2C is where citizens can obtain government information and services anytime, anywhere.

G2B (Government-to-Business): Concerns interaction between business and government. This includes high-level e-transaction projects like e-procurement and creating an electronic marketplace for the government to help business be competitive.

G2G (Government-to-Government): Between government agencies and's between international governments. The governments rely on the other levels of government in the state to effectively serve as modes of delivery and accountability mechanisms. G2G focus online communication and cooperation between government agencies and departments to pool database, resources, skills and capabilities so that duplication can be avoided and process efficiency /effectiveness is enhanced.

G2E (Government-to-Employee): The government works with its own employees. This gives workers the chance to have access to pertinent information on: compensation and benefits policies, education and learning opportunities, civil rights laws etc. G2E also refers to structural elements for promoting infusion of government goals and programmes as well as human resource management, budgeting and accounting. Source (Taifur, 2006 and Valentina, 2004)

So, in conceptual terms it can be said that 'e-government' is a precondition for 'e-governance' and at the same time one of the actors facilitating the overall 'e-governance'. For the purpose of this research study these two terms, however, will not be used interchangeably but different stages of e-government as per various models would refer to it as the stage of 'e- governance'. This is not illogical since greater level of e- government inevitably leads also to better e-governance.

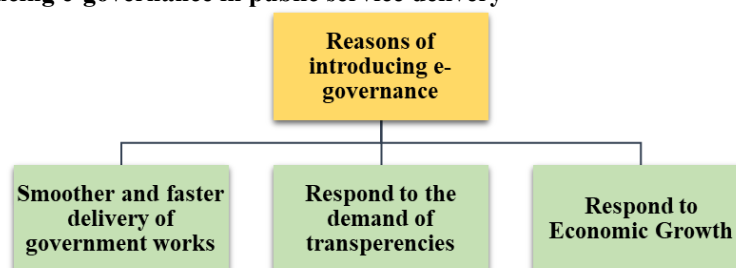**Reasons for introducing e-governance in public service delivery**

Figure 2.2: Reasons for introducing e-governance
Source: Introducing E-Governance in Bangladesh for improving public service delivery (Rahman, 2016).

Smoother and quicker delivery of Government works

There is no alternative of use of e-governance for making successful vision of Digital Bangladesh, it will contribute to the fast and effective time saving in providing citizen services. The promise of e-governance is high: it doesn't just ensure better services but also process without middlemen in between the supplicants with the authorities responsible for delivering that service (Rahman, 2016).

Transparency and accountability

Suitable reasons for applying e-governance system in public service When talking about transparency and accountable task, it is the best suited reason of application of the e-governance system. Transparency will also reveal that there is no underhand dealing to receive a service. Responsibilities would reveal the amount of reporting the responsible person is still required to do for any higher authority regarding his particular job. The dream of Digital Bangladesh would only come into reality if the dimension of transparency and accountability will be well-kept (Rahman, 2016).

Respond to economic growth

E-Governance is a very good source to minimize corruption that happens in Public Administration Because the all services like e-Registration, e-Tax, e-Tender, e-Education and other digital related services are appears in a transparent manner. In this a new system which everything is going on line. The online support system is indeed effective when it comes to reaction toward economic growth where corruption declines to meet economic goals (Rahman, 2016).

E-Government- History and Evolution

As Scholl (2017: 4) reflects about the 90s, categorizing a "something 'electronic' was intended to indicate modern, new and future-oriented activities based on information and communication technology (ICT)". In those times Internet and the web was considered a buzzword machine that started using the prefix 'e' on previously existing words such as: e-business, e-commerce and e-mail. The "electronic government" (later e-Government) also comes from the era. The concept has been initially proposed by IT industry and trade press, and then adopted by academia academic, politicians. 1950s used technology in public administration for efficiency. There was an attempt at computerizing government in the 1970s using MIS principles. The Internet explosion in the 1990s prepared ground for a wider use of ICTs towards a demand-based accountable governance. The crusade to implement e-Government was struck by US government in 1993 through a project named as the National Performance Review. Subsequently, including the UK ('government. direct'), Australia ('Clients First'), Canada and the Netherlands. G8, OECD, the World Bank and European Commission as well as other international organizations promoted the actions. One of such projects was the European Commission's eEurope project which focused inter alia on for government online. It was the next 30 years that saw broad international acceptance of the idea.

Stages of E-governance

As alluded to before, 'stages of e-government' will be used interchangeably with 'stages of e-governance' in the context of this study. Scholars and organizations have constructed a range of different models to describe the stages of e-government at different time points. Five stages of e- government development are identified based on United Nations' E-government Survey (2008). These stages are as follows:
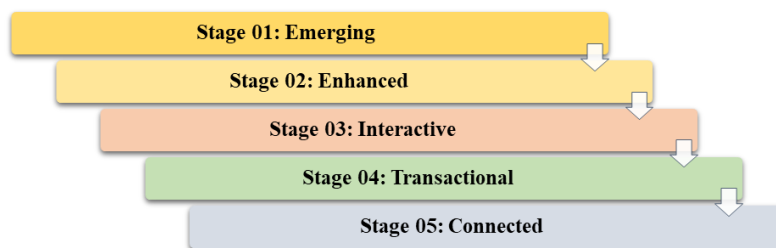
Figure 2.3: Stages of e-governance
Source: United Nations' E-government Survey (2008)

Emerging: Government use of the Internet is limited to a web page and, in some cases, an official site, with or without links to ministries or departments of education, health, social welfare, labor and finance. There is very little dynamism and not much interaction with the people."

Enhanced: More information is available from governments about their public policy and governance. They developed links to archived information that is, or once was, readily available to the public, such as documents/forms/reports/laws/regs/newsletters.

Interactive: Governments offer services like online tax form downloads and license renewals. Furthermore, the embryo of an interactive citizen portal/website containing services to maximize the convenience of citizens.

Transactional: 'Citizen to government' transforms enabling of two-way interactions as government starts to reform itself. It currently has options for paying taxes, ID cards, birth certificates, passport and license renewals and any other G to C transactions and the citizen can avail this service 24/7 online. All transactions are conducted online.

Connected: Connected Governments become an interconnected body that meets the demands of citizen by investing in integrated back office infrastructure.

Growth level of E-governance in some countries

This is not what residents of mature nations will ever need to consider a annoying to advise the administration if you have some several problem at the one kiosk 24 × 7, without standing in line (Beaumont, 2017). However, to reach the same level of skills and skills approachability for emerging countries citizens are difficult (Al-Hujran et al., 2015; Ndou, 2004). Experience of developed countries indicates it is possible, if governments will allocate the roles and activities and if admin switches to use e-resources (Gupta et al., 2008). This is a way that citizens can have exchange with administration via a website where all forms, law, newscast and others are available. While the administrations of developing countries by, as a community and base of information virtually algae This chic that to manage its residents and firms better; at improving on spending-incurring by making inner procedures better coordinated the complex-and spread out-hierarchical structure enabling the same.

Developed nations. advanced in epillarinis compared to less developed countries Development level of a country and ePillars There is a wide gap between gained numbers for each pillar when comparing the higher classification with one lower (OECD, 2014). There are some commonalities between the development of e-government and ecommerce. Just as e-commerce works to create a simplified and transactional space between business and the service consumer (B2C, B2B), the focus of e-government is also to make communication between the Government and citizens, business organization partners (G2B) and inter-agency relationships (G2G) a friendlier, comfortable atmosphere with transparency & accountability easy for people to use them without necessarily understanding complex processes in achieving these transactions effectively. Tapscott (1996) identified a development strategy for e-commerce in which societies developed from having positive only web presence to the provision of services such as business utilities and storefront and back office integration. Similarly, to that, the e-government stretches on a corresponding development line of Broadcasting- interaction-and transaction -and finally integration.

The other requirement for download efficiency: to measure e-fin government readiness, as suggested by Basu (2004), the evaluation of the government's institutional frameworks, manpower that would consist all ICT related employees as well as procurement staff and others) available fund resources to / turnover within department infrastructures; etc. is essential. Besides, to understand infrastructure status, economic level, education realm as well legal matters; corporate sector growth and other problems is very vital details (Beaumont. 2017). There are also wide variations between levels of development across countries with regard to the progress in their E-Government endeavor (Anderson et al., 2006).

OECD 2014 survey, none of the countries that were observed achieved a merger while only 17 countries had advanced to transaction. Most developing countries were either at the ascending or at the transmission stage, with very few supportive services for their citizens.

As per the research of UNDESA (2014) showing the development Position of E-Governance in developing country and its states that India, China which is the largest country in this world having highest population are not performing well behind to implement and development any e-governance while Japan resting at good rank.

e-Government as a public Policy Framework With ever-increasing ICT application in the public sector, policy issues are increasingly becoming central to e-government agenda.

Public action to be effective and efficient has to br1 conceived and built as a whole system. In practice, however a dichotomy with respect to policy making will appear which affects all levels, collective as well as individual agents and institutions toward formulating and implementing policies respectively. Policy breach originates from the dichotomy because, design and implementation are two semi-autonomous sub processes with a weak relationship each other.

Even more the policy analysis and design is a top- down process made by political –or heavily politicized- staff. It is goal directed and worked as a function of overall criteria - such as mission and vision ideas, organization- or environmental values a strategy, political preferences etc.

Policy implementation, by contrast, is largely a bottom-up undertaking among P.A. professionals middle managers and line workers. As a result, implementation efforts at intramural level are based on intramural priorities and day-to-day management needs, possibilities and limitations. They are focused on immediate results and lack well-defined connections to the "big picture" as well as ill-defined connections to their organization's long term direction, strategic outcomes, priorities, and goals.

The inappropriate link and mismatching between two complementary stages of a process that is supposed to be linear cause the collapse of the overall rational policy making framework and result in confusion, ineffectiveness and inefficiency of applied policies. Public policies are even less effective when the vertical gap is accompanied by a horizontal one which it typically is. Most policy results are in fact the intersection of unique processes in specific policy domains. Achievement from full employment for example can only be through a combination of economic (e.g. macro and micro), industrial, education/vocational training/regional development, social/ labor counselling laws and policy measures.

The lack of open lines of communication and coordination between all these diverse policy communities and networks is part of what leads to bad policy. Open Horizontal communication systems that do not work This kind of loosely coupled and inefficient system of horizontal communications this happens all the time in modern policy making and administration. Public organizations bunker themselves within their institutional, procedural and communicational redoubts, constructed over decades of history.

Figure 2.4: Classification of e-governance' implementation supporting factors
Source: Singh, Sahu, 2018, Study of e-governance implementation: A literature review using classification approach

E-Governance Literature in Public Service Delivery

Toaha & Khan (2008) postulate in a paper that the land registration is one of the obstacles to economic growth in Bangladesh. The specific theme of that paper is a number of the features and issues which flow from the current arrangements for land management. It provides an IT oriented land management system (Khoje and Mwangi) and suggests that computerized land management system can reduce frustration, time wastage, cost of resources and staff dishonesty.

Choudhury et al. (n.d.) invented a modeling Method for fabricating map in digital form. They believe it will make the existing land management system more transparent and efficient and enhance service delivery. We take out a new modeling approach which is indicated to express data for the on-land management system by means of a user-friendly and digital map oriented way.

TIB have recently (2015) issued a report on land management and services in Bangladesh, concerning the challenges of governance. It touches on key elements of land use and service delivery systems in passing. This article draws the legal, institutional and administrative challenges governing the land question. This article also highlights that incoherent system of land administration and management; service fragmentation in land, corruption and harassments faced by the service recipients, frequent transfer/deputation of administrative cadre officers, AC land's inadequate professional experiences and skills, insufficient field visits and monitoring, non-verification of the field reports are some administrative challenges.

Insufficient budget provision at the Ministry of Land, excessive shortage in manpower, lack of skilled workforce, full freeze trainings training infrastructure logistical supports technical resources transportation facility and follow up mechanism manual recording data management slow/down date/digitization process are some institutional challenges observed. Some of them are slow pace land survey, multi stages in mutational process and corruption problems at different levels of land management are also stated as a challenge in the land management system (Ibid).

Salam and Islam (2013) conduct a research to determine the E-Governance service quality of District E-Service Centre (DESC) of Bangladesh. Qualitative and quantitative studies were carried out. Service Quality of E-Governance service is measured with six different variables like quality of service, choice and consultation courtesy and open access entrance and information value for the money etcetera found the positive relationship of customer's satisfaction. The findings indicate that the DESCs are using public services effectively and their correlation with E-Governance services is positive.

Rokon-Ul_Hasan (2011) examines how ready bureaucracy is to implement e-governance through the study of office of the Deputy Commissioner, Dhaka. It also highlights the major barriers of E-Governance in the perspective of Bangladesh. It also agrees with service-seekers that the overall preparedness for E-Governance is very low. Lack of infrastructure and logistic Support and Weak policy and regulatory framework are the two most important inhibiting factors to the implementation of E-Governance. The findings show that the office in question is inefficient because staff are relatively technically incompetent. That the infrastructure is not meeting standards. There is not any motivation system to encourage the officers in adding some little effort for successful running of E-Governance.

Baniamin (2014) in a stud y examines the possibility of E-Governance in minimizing corruption on global level data and micro level cases. According to state level figures, the author deduces that E-Governance can account for a majority of the differences in corruption levels among different countries. According to his micro level research, the introduction of E-Governance alone cannot control corruption. Author clarifies that E-Governance can be an alternate service delivery mechanism through it"s the electronic medium. In this case officials would forfeit any influence, as the process could be entirely ruled by automation on the electronic platform concerned. The discretionary power of the officer can also be a force if the accountability mechanisms could become better.

Field et al. (2004) believe that such e-service can support to enhance the services quality level of the corporation in front of the client. Pathak et al. (2008), in a paper, argues that utilization of ICT for service provision enable the clients (citizens) to have an easy access into more information about Internet use while it reduces the chances of monopoly by public officers regarding relevant information.

Hopper et al. (2009), E-services can be effective in controlling corruption through the reduced interactions with officials, timely decision making and minimization of human errors. Kudo (2010) states that E-government has been advocated as a public sector reform strategy emphasizing on how it can enhance the managerial procedure.

Mentioning that, public services using E-Governance is expected to empower citizen and for interaction between governments and people for participating in overall development (Gage 2002) (Gasco 2003),.

Bhatnagar (2003) has contended that online systems have not only ensured efficiency gains resulting in a reduction of total time for processing one application, but also made transaction more observable, evidential and accessible to all. Singh et al. (2010) E-Governance reduces discretion and eliminates intermediaries by (a) replacing them by self service on internet to its citizen.

Electronic Public Service Delivery

It could be risked to say that the focus on public service delivery is an essential element of public administration since it provides for citizens who cannot get services because of a variety of disabilities. Bangladesh with its population of about 180 million is also poorly connected into the supply chain for public services and this is a Herculean task and one that the government apart from any other sector has to address. Somehow this process of unification has led to greater centralized control, where the national government and its bureaucracy are equally heavily relied upon for securing and exercising public services.

Conventional practice in administration of public services is seen as expensive, time-consuming, and inadequate for the needs of citizens. The major challenges of the public service delivery in developing countries are inefficiency, lack of transparency and accountability, inflexibility and corruption Siddiquee (2016). The old-fashioned way of doing things is deemed inefficient in today's world and Zussman (2002) proposed new service delivery models. Tremendous and remarkable technological advancements have made it possible for the government to provide public services through information technology. Gilbert et al. (2004) investigated why e-self-service delivery is chosen and concluded that citizens are inclined to use online services when the delivery agencies can build their trust. An assurance that their financial information is safe, the data is up-to-date and accurate, and that they will be saving time as well as money.

Online transactions are much cheaper than transacting offline, by mail, telephone or in person and make use of resources as a backend (Roy, 2017). Alternative delivery method experiments advanced with inspired public-sector management strategies. Ford and Zussman (1997) warned that governments can no longer sustain "rigid, bureaucratic, reactive, rules-driven organizations", but must convert these to "flexible, consultative, outcome-focused and proactive" public services (p. 2). IT, and the internet in particular enables governments to talk to citizens on a one-to-one basis for information exchange bypassing agencies that previously acted as the link between government and citizen (Pal, 1999, p. 26). So what I'm really saying is that no government can afford to provide public services in 'conventional' ways any more; they have to be actively transitioning to newer ways of doing this.

Wilson et al. (1998) define e-service as "a task or set of tasks that are performed in the course of a provider-customer exchange via an electronic channel". Essentially, e-service delivery refers to the use of technology to allow citizens access services without physically going to a Public Service outlet. The apparent benefits are the time and cost savings to citizens, eliminating the growth for bureaucratic organizations in multiple locations. The deposit adds the convenience and flexibility that is possibly beneficial for both demand and supply side of public service.

The nongovernmental literature on eservice delivery is still young and there is opportunity for sharing insights from case studies. Drawing on an extensive review of the extant literature, we outline the form and function of "e-service" centers across three tiers of local government. Bangladesh is administratively divided into a scheme of district, sub-district (upazila) and union level administration. This paper discusses some of such service areas, which were selected where the government of Bangladesh started piloting Electronic Service Delivery (ESD). It is in this context that the article analyses the experiences of implementation of citizens' charter, social safety net payment by electronic way and grievance redress system with a view to bringing out an empirical understanding on e-service delivery and its future prospect for Bangladesh.

Ministry of Science and Communication Technology

Ministry of science and technology are campaigning for technological knowledge to effect positive changes in the society. It is also striving for balanced social-economic development, from environment`s sustainable use. The organization has been working continuously for years to provide peace and prosperity of the country by involving all available technologies. The Bangladesh Telecommunication Regulatory Commission (BTRC) is an independent, statutory body comprised of fixed and mobile telecommunications service providers that was formed under the provisions of BTTA 2001 on 31st January. Powers and functions of the Commission According to the Telecommunication act, Chapter 1 of part III stipulates a range of assignments to be carried out by commission. Out of which setting up, operating, and maintaining the telecommunication companies is one of the prominent also providing various telecom services across the country. Also the task of BTRC is to determine the charges on the sub- scribers, securing services for people for the subscribers and make certain their rights. Concerning a fast and stable development of the social economy, to support a healthy telecommunication services in Bangladesh 31st January of 2002 formed Bangladesh telecommunication regulatory commission (BTRC) under section 34(1) by Bangladesh Telecommunication Regulatory Act 2001. But the Telecommunication Act (Amended) bill has once again been adopted in 2010.

III. E-Governance And Policies In Bangladesh

Background of e-governance of Bangladesh[1]

E-Governance has emerged as an important tool for transforming public service delivery, promoting transparency and citizen participation in Bangladesh. Envisioned under the 2009 mooted "Digital Bangladesh" roadmap, the government of Bangladesh has achieved significant strides in its municipal digitization process by streamlining administrative processes, improving service efficiency and eliminating bureaucratic impediments. A2I (Access to Information) programmed supported by UNDP and USAID etc. are one of the most visited e-governance programs. This, he said, is all about "making public services more accessible, less costly and friendlier." As part of the project a number of 8,800 plus Union Digital Centers (UDCs) have been established across the country for delivery of services such as online birth registration, passport application submission, access to land records and payment of utility bills and also publishing examination results. So, there are a lot of ministries and other government departments that have put criteria before going online for better services. Institutions such as NBR have introduced an e-filing system for tax, and Road Transport Authority permits vehicle registration online and renewal of driving license. Same as from the Ministry of Education through e-Admission and scholarship disbursed.

The Digital Land Management System is the second that performs a different milestone already in threatened and high-level transparency difficult land office system. And it is also the e-GP (Electronic Government Procurement) system, which has made possible transparency and accountability in public procurement. E-governance has also contributed to citizen participation and social accountability, as exemplified by the Grievance Redress System where citizens can find ways of registering complaints and receiving redress. Using mobile apps and SMS services, more individuals are also now able to gain access to government services-any place. However, challenges remain. Challenges related to low digital literacy of those living in rural areas, along with an uneven spread of internet connectivity among regions and privacy and cybersecurity concerns are challenges for the smooth transition. Furthermore, collaboration between departments and digital service innovation will be important for the team going forward.

Despite these difficulties, Bangladesh managed to take a few right steps in e-governance and is currently moving towards the making of an open, responsive and inclusive digital society. Miserable existence possible to all citizens. SD. Investment in 51 Effect of e-governance on the quality of life of People ICT development, capacity building and policy reform, existing requirements' EG can play a central role in achieving the Sustainable Development Goals (SDGs) and improve quality of life for all citizens.

Objective of e-governance master plan in Bangladesh[1]

The immediate objectives of the project would be to change the government-attitude in Bangladesh for e-Government and prepare plans on what, how and when? The project is also designed to reduce government corruption, improve public services, and increase national competitiveness over the long term as well as complementing the middle-term Digital Bangladesh strategy. Problems were prioritized and the most significant ones identified for a pilot project. Furthermore, capacity-building workshops will continue to be provided to increase understanding of e-Government implementation and dissemination of the latest ICT developments. It is expected that the project will help Bangladesh reach e-Government potential in line with master plan goals and implementation schedules. It will also help the government materialize its dream of Digital Bangladesh and to transform the country into a middle-income one.

Project team of e-governance master plan in Bangladesh[1]

This project has been launched as an International Aid Cooperation Program of KOICA after the conclusion of Record of Discussion between KOICA and ICT Division, Ministry of Posts Telecommunication & ICT, Bangladesh. The working groups are the Bangladesh Computer Council, and KITC Consortium.
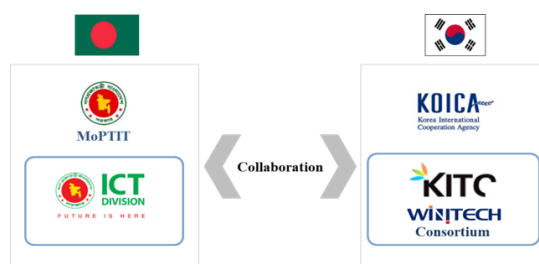

Figure 3.1: Project Team of Master plan of E-government master plan for Digital Bangladesh
Source: E-government master plan for Digital Bangladesh August 2019

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[1] E-Government Master Plan for Digital Bangladesh

Vision and Goals of e-governance master plan[1]

The e-Government Master Plan has been developed to support National ICT Policy 2018 and Digital Bangladesh. In this respect, the vision statement for e-Government is stated as:

Vision of e-Governance master plan[1]

"e-Government for Digital Bangladesh"

e-Government vision is to contribute to the realization of Bangladesh national vision "Digital Bangladesh" by building e-Government.

Goal of e-Governance Master Plan[1]
- Make Citizens' Lives Easier
- Make Businesses Competitive
- Make Government Innovative

Provide convenient Digital Services for citizens, enhance competitiveness of companies through providing Digital Services necessary for corporate activities, and promoting innovation in government affairs.

Objectives of E-Governance master plan in Bangladesh[1]

The main goals of e-governance in Bangladesh include:

Improving transparency and accountability: ICT infrastructure, tools facilitate monitoring of the government, reducing scope for corruption & ensuring that services are delivered as promised.

Increased Efficiency: Online services take away red tapes, facilitating quicker decision and service delivery.

Enabling Citizen Participation: People can engage directly with government, give opinion and access information and services.

Promoting Inclusive Growth: Use of e-Governance makes services available to all section of the society including people from rural areas and underprivileged.

Decreasing Transaction Costs: Automation allows for digital service provisioning which can reduce the administrative cost and hurdle burden on government and citizens.

e-Government Framework[1]

This diagram presents a layered blueprint for "e-Government for Digital Bangladesh," showing how laws, technology, and services connect to make public administration simpler for citizens and more efficient for businesses. At the base is the infrastructure the national government network (Gov.NET), the National Data Center (NDC), the Government Public Key Infrastructure (GovPKI) for secure identities and digital signatures, and the e-Government Service Cloud (eGSC) which provides secure, always-on computing, storage, and connectivity
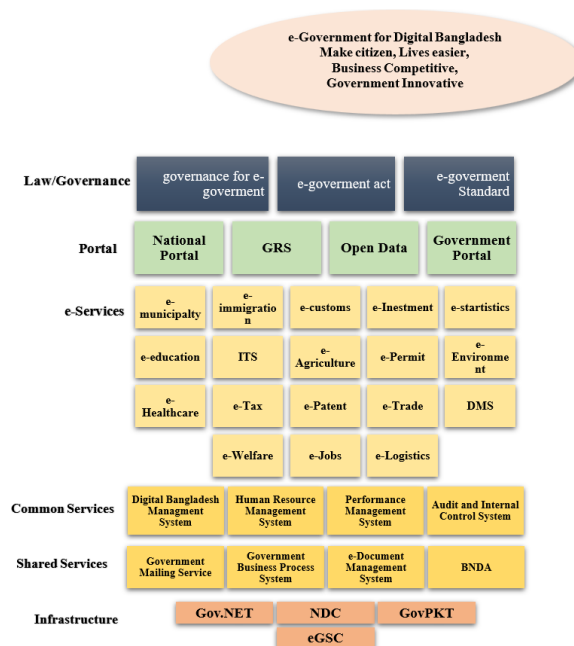

Figure 3.2: e-governance framework1
Source: e-governance master plan for public services 2018

Sitting above are shared services that many agencies reuse, such as government email, a business-process platform, an e-Document Management system, and the Bangladesh National Digital Architecture (BNDA) that sets interoperability rules so systems talk to one another. Common services then support internal government operations: digital budgeting, HR management, performance monitoring, and audit & internal control ensuring resources, people, and oversight are managed consistently. On top of these foundations are citizen-facing e-services everything from e-Municipality, e-Immigration, e-Customs, e-Investment, and e-Statistics to e-Education, intelligent transport (ITS), e-Agriculture, e-Permits, e-Healthcare, e-Tax, e-Patent, e-Trade, document services (DMS), social welfare, jobs, and logistics delivered digitally across ministries. Access to those services is organized through portals: The National Portal, the Grievance Redress System (GRS) for complaints and feedback, an Open Data portal for transparency and reuse, and a broader Government Portal. Overseeing the entire stack is the law/governance layer policy, an e-Government Act, and standards—which mandates security, privacy, data sharing, and service quality. Together, the layers illustrate how legal frameworks, shared capabilities, and robust infrastructure combine to deliver integrated, secure, and user-centric digital government.

Strategy of E-Governance in Bangladesh[1]
The improvement directions from analysis of current-status are as below:
- Align with National ICT Policy, establish a master plan that focuses on organized, rapid e- Government implementation.
- Considering that various e-Government related projects are being pursued by different ministries, systematic management for e-Government is essential.

Strategies have been defined for the propagation of the goals.
- Establish legal framework and governance for e-Government
- Establish effective government work innovation
- Improve Digital Services to be convenient and helpful to all
- Build infrastructure for secure Digital Services

Table 3.1: Major E-Governance Initiatives

Initiative	Description
National Web Portal	Over 25,000 government offices under one platform (www.bangladesh.gov.bd).
e-Filing (Nothi)	Digital documentation system for government offices.
MyGov App	A centralized mobile platform for accessing multiple public services.
Union Digital Centers (UDCs)	Over 9,000 centers across villages providing services like birth registration, utility bill payment, etc.
e-Passport	Biometric passports and digitized immigration.
Land Services Online	Digital land record access and mutation process (www.land.gov.bd).

Source: E-government master plan for Digital Bangladesh August 2019

The National Web Portal (www.bangladesh.gov.bd) serves as a centralized digital platform that brings together over 25,000 government offices. It acts as a one-stop access point for citizens to find information, download forms, and connect with various departments and ministries online, significantly reducing the need for physical visits.

Another major initiative is e-Filing (Nothi), a digital documentation and file management system used within government offices. It replaces the traditional paper-based filing system with an electronic method, improving efficiency, accountability, and record-keeping.

The MyGov App further expands accessibility by offering a centralized mobile platform through which users can access numerous public services on their smartphones. This initiative supports a user-friendly experience, enabling the population especially in remote areas to obtain services like certificates, information, and notifications directly from their mobile devices. Similarly, Union Digital Centers (UDCs) have revolutionized rural service delivery. With over 9,000 centers located in villages across Bangladesh, UDCs provide essential services such as birth and death registration, utility bill payment, mobile banking, and application processing, reducing the urban-rural digital divide.

The e-Passport system modernizes immigration processes by introducing biometric passports. It streamlines the passport issuance process and enhances national security with digitized data and international compatibility.

Finally, Land Services Online (www.land.gov.bd) digitizes land-related services by offering online access to land records, mutation applications, and ownership verification. This initiative combats corruption, improves transparency, and simplifies a historically complex and paperwork-heavy process.

Together, these initiatives demonstrate Bangladesh's significant progress toward building a digital government that is efficient, citizen-centric, and inclusive.

Outline of e-Government Master Plan[1]

E-Government Master Plan for Digital Bangladesh is to provide middle- to long-term strategies and implementation agendas for improving public services. The development of the master plan is executed in the following three stages - Analysis of Current-Status, Strategy, and Implementation Plan.
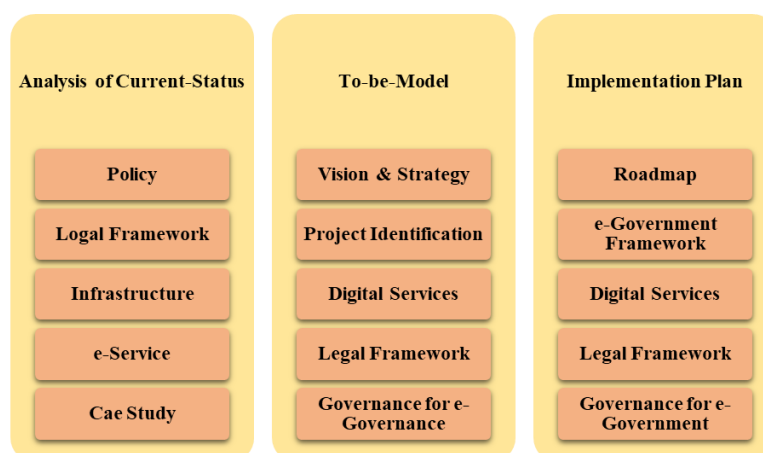
Analysis of Current-Status	To-be-Model	Implementation Plan
Policy	Vision & Strategy	Roadmap
Logal Framework	Project Identification	e-Government Framework
Infrastructure	Digital Services	Digital Services
e-Service	Legal Framework	Legal Framework
Cae Study	Governance for e-Governance	Governance for e-Government

Figure 3.3: Outline of e-government Master plan
Source: E-government master plan for Digital Bangladesh August 2019

Analysis of Current-Status
Objective

The discussions of the current-status will be helpful to evaluate on how far the e- Government in Bangladesh government side has progressed and what is doing in next for implementation.

Scope

The Scope of the project are (1) finding the setting of Bangladesh for e-Government in Bangladesh, (2) investigating on ICT related laws & policy; (3) understanding the governance architecture of Bangladesh for e-Government initiatives and activities, (4) identifying needs of Bangladesh by assessing present situation of ICT infrastructure and Digital Services. Furthermore, references in other countries like Korea and India etc will be reviewed to identify the direction of implementation for e-Government.

The status analysis will include the followings:
- General Environment of Bangladesh
  - The economic, demographics and ICT status of Bangladesh
- ICT and e-Government Policies
  - Bangladesh Vision 2021
  - Digital Bangladesh
  - National ICT Policy
  - Awami Leagues Manifesto 2018
- e-Government-related Legal Framework and Governance
- e-Government-related Legal Framework
  - Governance of ICT Activities
- e-Government Infrastructure
  - Government Network
  - National Data Center (NDC)
  - Union Digital Center (UDC)
  - Bangladesh National Digital Architecture (BNDA)
- e-Government Services
  - Shared Services
  - Services by Agencies

General Environment of Bangladesh
Overview of Bangladesh

The nation of Bangladesh is situated in South-East Asia. The nation is bordered by Myanmar (Burma) and India. With a total size of 147,570 km2 (ranked 92nd) and the eighth-largest population in the world

(163,882,000), it is one of the most densely inhabited nations in the world (ranked 12th). Compared to Hong Kong, its capital, Dhaka, has a density that is over 75% higher. Even transportation congestion and social safety hazards are caused by the population's high overcrowding. Bangladesh has many rivers and is primarily lush, fertile soil, which means it is good, agricultural land. More than 90% of the nation is at or below sea level. Every year, it also faces challenges from droughts, cyclones, typhoons, flooding, and sea level rise. It is a tropical and humid country with an average yearly temperature of about 28 degrees Celsius. However, as a result of climate change, its temperature recently dropped to 3.2 degrees Celsius, leading to deaths from cold-related illnesses. The establishment of a parliamentary system followed the country's independence from Pakistan in 1971. With 350 members chosen for five-year terms, the Parliament of Bangladesh is a unicameral legislature.

Economy

Bangladesh has witnessed an impressive economic growth over the last 20 years transforming itself from a low-income to a lower-middle-income country. The economy of the country is dominated by the ready-made garments industry, remittances and agriculture, followed by a rising service sector. Although the world is uncertain and domestic problems remain, infrastructure-building, digitalization and macroeconomic reform continue to support Bangladesh's steady growth. The government is giving high priority to investing in energy, transportation and digital connectivity. But the country also faces some smaller problems, those including high inflation, pressure on foreign reserve, dependence on imports. Export diversification, upgrading of labor and the investment climate are, however, essential if growth is to be sustained.

Table 3.2: Overview or Current Status of Bangladesh

Indicator	Value / Status
GDP (nominal)	$495 billion (approx.)
GDP Growth Rate	5.8% (projected for FY 2024–25)
Per Capita Income	$2,770 (nominal)
Inflation Rate	9.0% (due to food and fuel price pressures)
Unemployment Rate	4.2% (youth unemployment remains higher)
Poverty Rate	17.5% (continuing downward trend)
Remittance Inflow	$23 billion (2024)
Export Earnings	$60 billion (RMG ~85%)
Foreign Exchange Reserves	$20 billion (declining due to import bills)
FDI Inflow	$3.5 billion (2024)
Major Sectors	RMG, Agriculture, Services, ICT
Currency	Bangladeshi Taka (BDT)

Source: Report on the Bangladesh's Economy and Trade with Korea, KOTRA, January 2016
https://data.worldbank.org/indicator/NY.GDP.MKTP.CD,
https://www.macrotrends.net/global-metrics/countries/bgd/bangladesh/gdp-gross-domestic-product
https://fred.stlouisfed.org/series/PCAGDPBDA646NWDB
https://en.wikipedia.org/wiki/Bangladesh

The table provides a broader perspective of Bangladesh's economic outlook for FY 2024-25. Key areas such as ReadyMade Garments, agriculture, services and information and communication technology are contributing to the country's economy with a nominal Gross Domestic Product (GDP) of $495 billion and sustained high GDP growth. The projected 5.8 percent GDP growth of 2016 signals unswerving development in the face of international perturbations and domestic challenges, including inflation and pressure of external debt. Bangladesh: Per capita income in Bangladesh is $2770, with slow increase in earning and a lower middle-income country (World Bank). But inflation is a big worry, still running at 9.0 per cent on surges in prices from food to fuel. This has a direct impact on the cost most felt by households the costs of living since, especially, for low and medium income households. The overall unemployment rate is a relatively low 4.2% but this aggregates to far higher joblessness for the young, revealing a disjunction between education and labor-market requirements. On a positive note, this impoverished fighting rate has declined to 17.5%, reflecting benefits that the social economic factor is favorable and poverty alleviation efforts are effective. Remittances remain central to the economy, bringing in $23 billion in 2024 from migrant workers abroad that feed into local consumption and rural development. Export The rolling export amount of the country is 60 billion US Dollar where at global market textile sector contributing 85% only (Hossain, November). This number also stated that Bangladesh economy was depend on this industry source. Nevertheless, this low level of diversity in the composition of exports makes it vulnerable to external demand changes. Consequently, forex reserves have dropped to $20bn a massive risk as far as balance of payments and currency stability are concerned. FDI at $3.5 billion is by all means low but not alarmingly so when considering foreign investor confidence and could only continue to rise with better ease of doing business. "Bomb Explosion" redirects here. For other uses, see 1993 Bombay bombings. Summary: While Bangladesh 's performance in resilient and stable growth has been commendable, some new challenges such as

dealing with inflation management; employment generation and inducement of investment call for attention that is changed for realizing sustainable development.

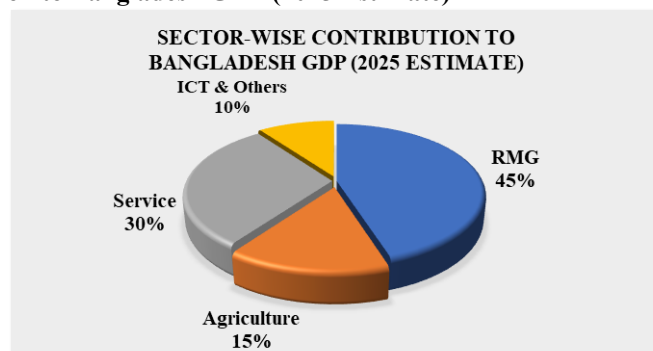**Sector-Wise Contribution to Bangladesh GDP (2025 Estimate)**

Figure 3.4: Sector-Wise Contribution to Bangladesh GDP (2025 Estimate)
Source: https://www.thedailystar.net/anniversary-supplement-2024/bangladesh-the-world-stage/news/the-rapid-growth-bangladeshs-economy-and-what-comes-after-3543361
https://en.wikipedia.org/wiki/Bangladesh
https://www.trade.gov/country-commercial-guides/bangladesh-market-overview

Based on the pie chart (Pie chart which shows the projected contribution to Bangladesh's GDP in 2025), a number of images show that Bangladesh economy is still based on some backbone sector and its continuation, Ready-Made Garments (RMG) holds the key role. It is also estimated that the garment sector alone contributes 45 percent to GDP. This dominant stake mirrors the sector's central nature as the country's leading export earner and a massive employer. The country's economy, as a whole, rides or dies on its success. Service sector is probably the second with 30%17. That includes a lot of things; wholesale and retail trade, transportation and storage, accommodation and food service, data processing and communications, financial activities insurance; real estate; as well as government. This significant investment reflects a long term urbanization and development trend in the Bangladesh local market and infrastructure. Agriculture, long the dominant sector of the economy, will reportedly amount to just 15% of GDP. While its contribution has become less important than industry and services, it is still of paramount importance. It provides employment and income to a large proportion of the population in Bangladesh, particularly those working in agriculture, supporting food security for the population as well as raw materials for most industries (e.g. jute, cotton RMG) including Food processing. The "ICT & Others" sector will contribute 10%, the report states. This includes the nascent ICT sector software, IT services, telecommunications and digital services that represent the fastest-growing new industry in Kenya and is now a government priority for further expansion and maturity. It is likely the residual "Others" category is some lower-industrialized subsectors outside RMG (pharmaceutical, ship building; leather and ceramics), as well construction and utilities. Diversification of economy (like IT, E-commerce, energy etc.) This one is about diversifying the economy apart from the 3 main pillars (RMG, Services secondary - in a bad way & Agriculture) and where we can see future prospects.

Figure 3.5: Export Composition of Bangladesh (2025)
Source: https://doi.org/10.61606/BJMIS.V10N1.A4
https://doi.org/10.1787/8b925b06-en
Bangladesh Enterprise Institute 2018
https://en.wikipedia.org/wiki/Economy_of_Bangladesh
https://kathmandu.mofa.gov.bd/en/site/page/Major-Export-Products-of-Bangladesh

Based on the 2025 forecast, Bangladesh exports are already and still primarily in one single sector. Accounting for as much as 85% of the country's total exports, the RMG shouldered the truck of Bangladesh's export economy. It reflects the country's status as a leading manufacturer of clothing in the world, relying on competitive wages and an already existing manufacturing base to do business with international fashion companies. It puts more traditional industries right there at 5%. They are also based on leather (shoe, bag), jute (sack, textiles diversified items) but they run into obstacles such as added value and environmental protection. It's a segment that is proliferating at 3% and of strategic importance. In the last 10 years that country has seen spectacular growth in drug production. Currently, it holds about 20% of the market share in generic formulation worldwide. And ICT & Others, also at 3%, which might be things like software development, IT services, BPO and maybe other marginal export products - ceramics or light engineering. It is a possibility that is small-scale now, but one with great potential as an export earner and for diversification.
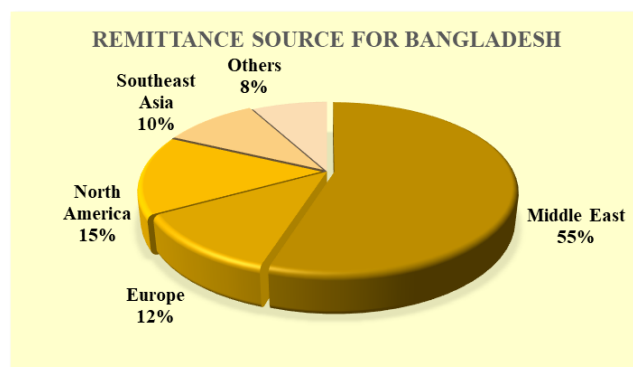

Figure 3.6: Remittance Sources of Bangladesh
Source: https://www.bb.org.bd/econdata/remittance.php
https://www.bb.org.bd/pub/monthly/econtrds/

From the pie chart shown, if such you see the contributions of afflux for Bangladesh then its maximum contributor is from just one region and others have a wider spread. Middle Eastern countries account for more than half, a strong 55%." This, in turn is a microcosm of the massive flow of migrant labor from Bangladesh to the GCC countries Saudi Arabia, UAE, Kuwait, Qatar and Oman and Bahrain. As a result, tens of millions of Bangladeshi workers are working in those countries particularly construction and infrastructure development, hotel and restaurant industry and domestic works including maidservants, household services sectors among others. It is their remittances that provide the crux for remittance flow into Bangladesh. North America (including both USA & Canada) with a share of 15\%. This is the money going out to these countries, from the huge and well-established Bangladeshi diaspora in those countries – professionals, skilled workers, business entrepreneurs with their families. Europe accounts for 12%. This also includes remittances from Bangladeshi communities in U.K., Italy, Germany, Spain, Portugal and other European countries and a few hundred in South Korea-Japan-Singapore and as well as some working in Mid East North America etc. There they work into different service & Au pair (Nanny staff) industries as well as owning shops.

SE Asia are contributing 10%: This is likely to include money sent in my Bangladeshi workers from powerhouses Malaysia and Singapore where Bangladeshi migrants work in manufacturing, plantation rein our construction. Others (8%) – This includes places mentioned in the list, but for those under 1% in every country listed (I added Australia into this section), plus some of Africa, east Asia and like countries, or a minority Bangladeshi outside of this list.

E-Government Development Index[1]
Bangladesh ranked 115th out of 193 countries with its E- Government Development Index value of 0.4862, remaining in the medium and low score groups. It scored lower in TII than in OSI and HCI, requiring much improvement in the relevant sector.

Table 3.3: E-Government Development Index

Indicator	Score
EGDI Score	**0.4862**
Ranking	115th out of 193 countries
OSI (Online Services)	Moderate
TII (Infrastructure)	Low
HCI (Education)	Moderate

Source: UN E-Government Survey 2018, 2016, 2014

Bangladesh falls into the "Medium EGDI" category. It has made progress in online service delivery and human capital, but telecommunication infrastructure remains a key area for improvement.

Table 3.4: E-Government Development Index Ranking

Country	EGDI Score	Rank
Denmark	0.949	1st
South Korea	0.928	3rd
India	0.578	105th
Bangladesh	**0.486**	**115th**
Nepal	0.462	120th

Source: UN E-Government Survey 2018, 2016, 2014

The table shows the E-Government Development Index (EGDI) scores and global rankings of selected countries. Denmark leads with the highest EGDI score of 0.949, ranking 1st globally, followed by South Korea with a score of 0.928 in 3rd place. Among South Asian countries, India ranks 105th with a score of 0.578, while Bangladesh follows at 115th with 0.486. Nepal ranks 120th with a score of 0.462. This comparison highlights a significant digital development gap between developed nations and countries in South Asia, emphasizing the need for improved e-government initiatives in the region.
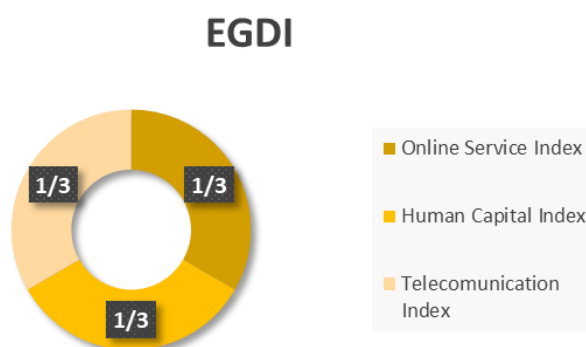

Figure 3.7: Classification E-Governance Development Index
Source: UN E-Government Knowledgebase, https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index

Online Service Index (OSI)
- Evaluates the capability of government to provide basic services to its citizens; concentrates on official website or Govt representative portal; qualitative analysis is conducted according to whether the particular relevant feature exists on homepage.
- Explores the extent to which relevant ministries of health, labor, education, social welfare and finance as well as each country's National Portal have access to featured online services.
- Evaluates governments delivery on the provision of essential services to its citizens; is centered on official web site or government representative portal and does quantitative analysis based on the presence of a set of pertinent features in the websites.
- In the case of national ministries responsible for labor, health, education, social welfare and finance and each country's national portal Website checks whether they provide relevant online services.

Human Capital Index (HCI)
- Assesses the overall level of public intelligence that is used to measure citizen usage of e-government services, and
- This composite of four indicators is a weighted average resulting from four components: the adult literacy rate, the combined primary, secondary and tertiary gross enrolment ratio (GPI), the expected years of schooling and the mean years of formal schooling.

Telecommunication Infrastructure Index (TII)
- Evaluates the state of telecommunications-related infrastructure, which is necessary before e-Government can be implemented, and
- It is a composite of four weighted average metrics (i.e., estimated internet users per 100 residents,

E-Participation Index (EPI)[2]

The E-Participation Index (EPI) is a component of the United Nations' E-Government Development Index (EGDI), measuring how effectively governments use digital tools to involve citizens in public decision-making.

It assesses three stages of participation: e-information, e-consultation, and e-decision-making. In the most recent UN E-Government Survey (2022), Bangladesh ranked 75th out of 193 countries, with an EPI score of 0.6780. This shows a steady improvement from previous years, indicating growing use of online tools to engage citizens.
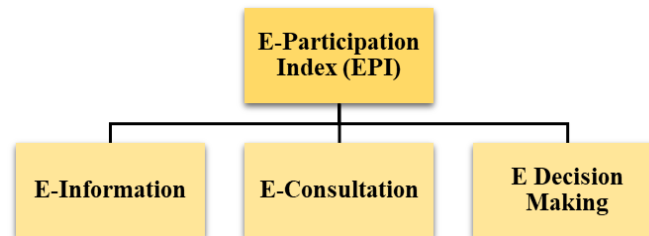

Figure 3.8: E-Participation Index
Source: E-Government Master plan for digital Bangladesh 2018

Breakdown of the Three Key Components
E-Information

Bangladesh has made significant strides in providing online access to public information. Government websites, such as bangladesh.gov.bd, offer details about public services, policies, and development programs. This increases transparency and builds public trust.

E-Consultation

E-consultation tools, such as online feedback forms, email communication, and social media platforms (e.g., Facebook pages of ministries), are increasingly used. Citizens are encouraged to give opinions on public services, budget allocations, or policy drafts, though institutional mechanisms for large-scale, inclusive consultation are still under development.

E-Decision-Making

This remains the weakest area for Bangladesh. While some participatory platforms exist (like the "a2i" program's initiatives), public influence on actual policy-making via digital platforms is still limited. The government needs to implement more robust frameworks to incorporate citizen feedback into final decisions.

Policy of e-governance[1]

The government's guiding ideals and strategic course for building a society empowered by technology are referred to as the policy component of e-governance. The promotion of technology-driven public services in Bangladesh has been greatly aided by historic programs like the National ICT Policy 2018 and Digital Bangladesh Vision 2021. These regulations seek to guarantee openness, effectiveness, and service delivery that is focused on the needs of the public. They describe how ICT is used in public administration, business, education, healthcare, and agriculture. They also prioritize encouraging e-participation, optimizing government processes, and decreasing corruption through automation. However, bureaucratic inertia, irregular funding, and a shortage of qualified personnel continue to make it difficult to implement policies effectively. In addition, many policies have lofty objectives but lack quantifiable KPIs and clear operational guidelines, which makes monitoring challenging.

Rural and marginalized populations continue to face access barriers, resulting in a digital divide, even though policy-driven digital initiatives have benefited urban areas. In order to guarantee that e-services are usable by everyone, including those with disabilities, inclusivity must be ingrained as a policy priority. In order to stay up with emerging technologies like artificial intelligence (AI), the Internet of Things (IoT), blockchain, and big data all of which have the potential to greatly improve governance regular policy reviews are essential. Cooperation with academic institutions, private sector innovators, and foreign partners is required to fortify the policy framework. To make sure that people are aware of their digital rights and the e-services that are available to them, public awareness campaigns are also crucial. In the end, policies should incorporate accountability, transparency, and inclusivity at all levels of governance and include practical, time-bound action plans in addition to setting ambitious goals.

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[2] https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index

ICT and e-Government Policies[1]

2008 to 2025 has been a time of transition for Bangladesh in governance system and public pro-vision, due in great part to the process of integrating ICT. In the context of the vision "Digital Bangladesh" launched in 2008, Bangladesh has adopted digitalization as a core strategy to attain good governance, inclusive development, transparency, and efficiency of the public service. Over a series of policy efforts, restructuring of institutions and investments in technology, the country has made much progress in advancing e-governance and in harnessing ICT for socioeconomic advancement.

- To become a participatory democracy
- To have an efficient, accountable, transparent and decentralized system of governance
- To become a poverty-free middle-income country
- To have a nation of healthy citizens
- To develop a skilled and creative human resource
- To become a globally integrated regional economic and commercial hub
- To be environmentally sustainable
- To be a more inclusive and equitable society

Digital Bangladesh[1]

Prior to the 2008 general elections, the Bangladesh Awami League declared Digital Bangladesh as a strategic direction to realize Bangladesh Vision 2021, highlighting the significance of ICT-based development as a fundamental component for laying the groundwork for a knowledge-based society. A political commitment to use contemporary technology to influence all facets of people's personal and public lives is known as "Digital Bangladesh." According to the transformative vision, ICT may be used to improve human resources and lessen poverty. It also highlights how important ICT is to resolving the nation's social, cultural, and economic problems. In order to achieve Digital Bangladesh, it lists the following four top priorities.

The implementation of a digital government made up of e-public services and e-administration, as well as the introduction of ICT in businesses, are made possible by human resource development and citizen connectivity. This will facilitate improved market access, the promotion of ICT-related businesses, and the expansion of ICT exports. The goal of the digital government is to use ICT to give the underprivileged and impoverished access to transparent, reasonably priced public services. Agriculture, education, land and water resource management, social safety nets, disaster relief, environmental reforms, law enforcement, and local governments are the primary focus areas.

Launched on December 12, 2008, the "Digital Bangladesh" initiative aimed to transform Bangladesh into a knowledge-based, middle-income country by 2021 through the use of ICT in four key areas:
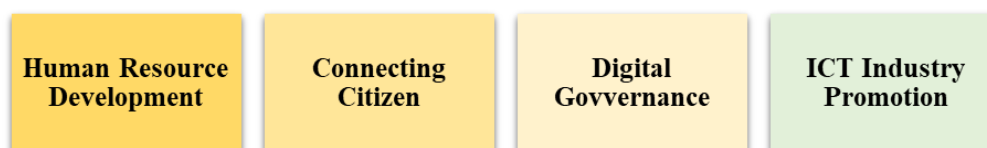

| Human Resource Development | Connecting Citizen | Digital Govvernance | ICT Industry Promotion |

Figure 3.9: Key Areas of ICT of Digital Bangladesh
Source: E-Government Master plan for digital Bangladesh 2018

Human Resource Development

Core to Digital Bangladesh was the growth of a skilled and digital literate workforce. Aware that human capital is key to sustainable development, the government undertook various actions to develop ICT knowledge and digital literacy from primary education to higher education. "ICT in Education Master Plan", multimedia classrooms, and teacher training programmes these and the like became nationwide projects. Vocational-training facilities and youth-skills-development programmes were also expanded to prepare citizens, particularly rural youth and women, for the skills demanded by digital jobs. This not only provided them economic independence, but even generated employment opportunities for them also.

Connecting Citizens

This pillar aimed at ensuring affordable and non-discriminatory access of ICT to all the citizens. People living in remote areas were given access to government services, information and education, including e-commerce, via the 8,800-odd Union Digital Centers (UDCs). The penetration of broadband internet notably increased with initiatives like Info-Sarker projects, while mobile connectivity grew with the 4G rollout. The aim was to close the technology gap by making it possible for all citizens to engage in the digital economy, to access vital services through the web, and to communicate effectively through technology.

Digital Government (e-Governance)

To address these challenges and better promote transparency, accountability and efficiency in governance, the government leveraged digital intervention to re-engineer public service delivery. Multiple ministries and agencies were digitized to allow citizens to access services like land records, utility bills, tax filing, and passport application online. Portals such as Bangladesh National Portal (www.bangladesh.gov.bd),myGov and ekPay were introduced. In addition, automation in areas such as policing, education and health led to improved governance and reduced graft. The goal was citizen service models that could build on technology.

ICT Industry Promotion

The government sought to transform Bangladesh into an ICT regional hub through fostering local innovation, investment, and entrepreneurship. Tax breaks, IT parks and startup incubators were established as part of efforts to encourage local and foreign investment in the ICT industry. Programs such as StartUp Bangladesh, High Tech Park and the Bangladesh Computer Council (BCC) supported the development of a thriving tech community. This led to a surge in IT and ITES (IT Enabled Service) exports and jobs. The long-term aim was for that switch to turn a nation from a digital consumer into a digital producer.

National ICT Policy[1]

In order to achieve Digital Bangladesh by 2021, the government of Bangladesh created the National ICT Policy in 2009 and made amendments in 2015 and 2018.

In the National ICT Policy 2018, the government of Bangladesh established a single vision, eight objectives, fifty-five strategic themes, and three hundred and forty-three action items. While strategic themes and objectives should be evaluated every three years, the progress of the action plans should be assessed at least once a year. Every six years, the entire policy should be reviewed. Article 19 of the People's Republic of Bangladesh's Constitution served as the foundation for the creation of the country's ICT policy. According to the constitution, ICT is the most effective way to guarantee equal opportunities for all citizens, eliminate social and economic disparities between men and women, and guarantee the fair distribution of wealth and opportunities among citizens in order to achieve a consistent level of economic development across the Republic. After analyzing the sixth five-year plan and assessing the progress, the government modified the National ICT Policy and enacted the National ICT Policy 2018.

Figure 3.10: National ICT Policy
Source: E-Government Master plan for digital Bangladesh 2018

The Vision of the National ICT Policy is "Expand and diversify the use of ICTs to establish a transparent, responsive and accountable government; develop skilled human resources; enhance social equity; ensure cost-effective delivery of citizen-services through public-private partnerships; and support the national goal of becoming a middle-income country within 2021 and join the ranks of the developed countries of the world within thirty years".

The structure of National ICT Policy 2018 is as a hierarchical pyramid with a single vision, 8 objectives, 55 strategic themes. Individual strategic themes have action items which are either middle-term or long- term.

Figure 3.11: National ICT Policy Act 2009
Source: E-Government Master plan for digital Bangladesh 2018

Digital Government
ICT integration at all levels of government administration is the aim of digital government, which aims to guarantee openness, effectiveness, and convenience in accessing public services. This entails creating digital platforms that are compatible with one another, digitizing administrative procedures, and using e-governance to deliver services right to citizens' doorsteps. Creating reliable and technically sound information management systems to facilitate data-driven governance is a primary goal. This method makes it easier for citizens, particularly those living in rural or underserved areas, to access services like birth registration, land records, or social safety net programs online, while also reducing bureaucracy and improving public sector accountability.

Digital Security
ICT infrastructure must be safe and threat-free due to the quick growth of digital services. The policy places a strong emphasis on building a robust digital ecosystem in order to improve cybersecurity. This covers the creation and execution of national cybersecurity frameworks, safeguarding vital information infrastructure, raising awareness, and enforcing digital laws. In order to ensure the safe use of ICT in governance, finance, health, and education, the objective is to prevent cyber threats like hacking, identity theft, disinformation, and data breaches.

Social Equity and Universal Access
This goal is to close the digital divide and make sure that everyone in society can benefit from ICT, regardless of socioeconomic background, gender, geography, or physical capabilities. Through the development of infrastructure (such as broadband in rural areas), inclusive content (in local languages or Braille), and reasonably priced internet, the government hopes to make information and services available to underserved communities. In order to empower all citizens equally in the digital age, universal access also entails addressing digital illiteracy and making government websites and e-services accessible to those with disabilities.

Education, Research and Innovation
ICT is seen as a game-changing instrument for modernizing the educational system and encouraging an innovative culture. In order to establish a knowledge-based society, the policy advocates for developing digital classrooms, growing e-learning platforms, and incorporating ICT into curricula. Additionally, by offering tech startups funding, mentorship, and incubation centers, it supports research institutions and fosters collaborative innovation. Additionally, the government encourages researchers and students to use ICT tools to come up with unique ideas and solutions for the advancement of the country.

Skill Development and Employment Generation
The policy emphasizes the significance of creating a sizable pool of qualified ICT professionals in order to support a digital economy. In order to match curriculum with industry demands, this involves establishing ICT training programs, vocational education, and industry-academia partnerships. Bangladesh hopes to lower youth unemployment and create new job opportunities in industries like digital marketing, software development, freelancing, and outsourcing by upskilling its workforce. Women, young people from rural areas, and people with disabilities are given special attention when it comes to skill-building initiatives.

Strengthening Domestic Capability
Building a self-sufficient local ICT sector that can serve both domestic and foreign markets is the main goal of this objective. The policy encourages foreign direct investment in the IT industry, supports regional software and hardware producers, and fosters entrepreneurship. Attracting investors requires establishing a business-friendly regulatory environment with tax breaks, simplified company registration, and enhanced digital

infrastructure. Promoting Bangladeshi goods and services in international ICT markets is another way to increase domestic capacity.

Environment, Climate & Disaster Management

The policy encourages sustainable practices like green technologies, economical energy use, and appropriate e-waste management in recognition of the environmental impact of ICT growth. It also emphasizes how important ICT is for managing emergency responses, predicting natural disasters, and tracking climate change. Early warning systems and disaster risk reduction will make use of technologies like Geographic Information Systems (GIS), remote sensing, and real-time data analytics. Building climate resilience and advancing environmental sustainability are the objectives.

Enhancing Productivity

ICT is regarded as a major productivity enabler in a number of industries. Through weather advisory systems, market access apps for farmers, and precision farming, the policy seeks to digitize agriculture. In order to increase access and lower costs, it supports telemedicine, digital health records, and mobile health services. ICT adoption is encouraged in the financial services, transportation, and industrial sectors to boost productivity, lower corruption, and encourage entrepreneurship. Bangladesh aims to boost the expansion of digital businesses and enhance overall economic performance by utilizing digital tools.

e-Government-related Legal Frameworks and Governance[1]

The laws, rules, and guidelines controlling the use of ICT in public administration are outlined in Bangladesh's legal framework for e-governance. Important pieces of legislation include the Right to Information Act of 2009, which encourages transparency; the Information and Communication Technology (ICT) Act of 2006 (modified in 2013), which made electronic records and signatures lawful; and the Digital Security Act of 2018, which deals with data breaches and cybercrimes. These laws serve as the foundation for safe online transactions, the protection of citizen data, and the provision of online services. But there are still gaps. Information about citizens is at risk because the current legal framework lacks comprehensive data protection and privacy laws that are comparable to GDPR standards. Furthermore, enforcement mechanisms are frequently ineffective, and judicial and law enforcement agencies lack the technical know-how necessary to adequately handle cyber-related cases.

Another difficulty is striking a balance between security and free speech; although digital security laws are intended to prevent cybercrimes, some of their provisions have come under fire for possibly limiting free speech. Legal frameworks need to be updated frequently to accommodate new technologies like blockchain, artificial intelligence, and cloud computing in order for e-governance to be effective. To guarantee interoperability without sacrificing privacy, laws should explicitly outline the procedures for data sharing between government agencies. Specialized digital forensic units, cybercrime courts, and police and judge training programs are also required. Managing global cyber threats also requires cross-border legal cooperation.

Campaigns for public legal awareness can increase confidence in online government services by educating the public about their rights and obligations in the digital sphere. All things considered, safe, open, and citizen-friendly e-governance in Bangladesh requires a robust, contemporary, and well-balanced legal framework.

The Information and Communication Technology Act of 2006

The Information and Communication Technology Act of 2006, which was subsequently amended in 2009 and 2013, is one of the fundamental pieces of legislation in this regard. Data integrity, digital signatures, cybercrimes, and electronic transactions are all legally supported by the ICT Act. By acknowledging the legitimacy of digital communication and electronic records, it makes e-governance easier to implement. The Act also created the Controller of Certifying Authorities (CCA) and the Bangladesh Computer Council (BCC) to oversee secure electronic communication and digital certification. But because of the ICT Act's shortcomings, especially the contentious Section 57, it was partially repealed and replaced by the Digital Security Act of 2018, which attempts to secure the digital environment and stop cybercrime but is criticized for restricting free speech and expression

The Right to Information Act (RTI) 2009

The Right to Information Act (RTI) 2009, which supplements the ICT Act, has been a crucial piece of legislation for guaranteeing accountability and transparency in government. In order to improve citizen engagement and facilitate digital access to government-held data, it requires public institutions to make information available both proactively and upon request. By encouraging digital portals, online service delivery methods, and open government data initiatives, the Act advances e-governance.

The Digital Security Act of 2018

The Digital Security Act of 2018 was introduced to guarantee cybersecurity and safeguard vital information infrastructure in accordance with the goals of digital transformation. Hacking, identity theft, cyberterrorism, and digital fraud are among the crimes made illegal by the Act. Although it is essential for protecting the electronic infrastructure that underpins e-Government, its alleged overreach and unclear provisions have also sparked human rights concerns.

Electronic Transactions Act

Online contracting and e-commerce are made possible by the Electronic Transactions Act, which is a part of the ICT legal framework and gives digital signatures and electronic documents legal status. This has greatly aided in the digitization of e-payment systems, public financial management, and procurement all essential components of the infrastructure supporting e-government.

Data Protection Act

In the governance of e-Government systems, privacy and data protection are also becoming more and more crucial. The government of Bangladesh is working to draft a comprehensive law to protect personal data, regulate cross-border data flow, and guarantee accountability in data processing, despite the fact that there is currently no specific Data Protection Act. Until then, various clauses in the Digital Security Act and the ICT Act regulate data protection.

Legal requirements for e-filing (e-nothi), e-tendering (e-GP), and e-payment systems are further important measures the government has taken to modernize public administration. Administrative orders and policy directives have institutionalized these systems, improving service delivery, decreasing corruption, and increasing efficiency. Even with great advancements, difficulties still exist. The effective governance of e-Government is hampered by legal ambiguities, a lack of harmonization among various laws, gaps in institutional capacity, and low levels of digital literacy among citizens and public employees. Legal frameworks must be updated frequently to take into account new developments in technology, protect digital rights, and guarantee inclusivity in order to meet these challenges.

Offences and Penalties:

- If anyone commits any offences against essential information infrastructure, he or she will be punished by imprisonment for a minimum of two years and a maximum of 10 years and a fine not exceeding 10 lac Taka.
- If anyone commits any forgery or fraudulence using a computer, he or she will be sentenced to imprisonment for a minimum period of one year up to a maximum of five years and a fine not exceeding three lac Taka.
- If anyone commits cyber terrorist activities, he or she will be punished by imprisonment for a minimum of two years and a maximum of 14 years and a fine not less than one crore Taka. If the chief of the company commits such offences, he or she will be punished by the same imprisonment and a fine not exceeding three crore taka.
- If anyone commits any pornography and child pornography offences, he or she will be sentenced to imprisonment for not more than two years and a fine not exceeding two lac Taka and imprisonment for not more than five years and a fine, respectively.

e-Government Infrastructure[1]

Government Network

The Bangladesh government deployed its communications network in two stages and has entered the third stage for expansion.

Figure 3.12: e-governance infrastructure
Source: E-Government Master plan for digital Bangladesh 2018

Phase I - BanglaGovNet Project (Apr. 2010 – Jun. 2014)

Phase I - The BanglaGovNet project aimed to build a public network backbone connecting all government organizations. The project was supported by the Economic Development Cooperation Fund (EDCF) of KO- EXIM Bank. The project started in April 2010 and ended in June 2014. It connected the National Data Center with 43 ministries. Also, 128 organizations, 64 districts and one upazila under each of 64 districts were connected with the backbone network.

Phase II - InfoSarker Project (Jul. 2011 – Jun. 2016)

Phase II - Financed by the preferential concessional loan of the Chinese government, the InfoSarker project increased the network capacity of the National Data Center. The network was established between the 64 districts that were connected to the backbone network during Phase 1 and 488 upazilas. Also, 800 video conferencing systems and a disaster recovery center were deployed. A training center for developing ICT capabilities was established at BCC.

Phase III - InfoSarker Extended

InfoSarker Phase3 is an extension of government ICT network to the lowest tier to administration (for example, Union from existing network up to Upazila (sub-district) through InfoSarker Phase2 and BanglaGovNet (InfoSarker – Phase 1). This project is to provide Internet access to 2600 Union Parishad, 488 Upazila Parishad and 1000 police connectivity under 64 districts in all over the country. According to Secretary of ICT Division, Zuena Aziz, necessary equipment has been installed in 2,300 unions and about 9,500 km optical fiber cable lines have been set up to establish broadband internet connectivity. Some 2,600 unions are expected to come under high-speed internet connectivity (90% of work completed, December 2018).

National Data Center (NDC)[1]
National Data Center 01

Deployed in 2009, the National Data Center (NDC) was upgraded to become a Tier-3 facility through its first expansion in 2015. 90% of the public websites and about 40,000 mail accounts are hosted on the NDC. The data center maximizes the utilization of ICT resources with server virtualization and provides backup and file server services. Also, the NDC has a service catalogue from which organizations can choose a service they want.

National Data Center 02

A new National Data Center is being built in Kaliakair Hi-Tech Park, Dhaka Division, 50 km north-northwest of capital Dhaka. The construction is scheduled to be completed in June 2018. The second data center was funded by the Chinese government. It satisfies Tier 4 requirements in service capacity and is fully redundant in terms of and network and power supply. The second NDC will serve as a backup of the first National Data Center after the construction.

Disaster Recovery Data Center

The Disaster Recovery Data Center is built in Jashore, Khulna Division, 300 km southwest of Dhaka for secure recovery of public data.

Union Digital Center (UDC)

Access To Information (A2I) programed took initiatives to establish Union Information Service Center (UISC) in 2009 which is renamed as Union Digital Center (UDC) in 2014. Establishing ICT based center at every union (the lowest tier of local government) of the country is one of the best practice of e- Government related project in Bangladesh. Bangladesh with area of 141,770 square km and 154 million populations is a rural based country. More than 80% of people live in rural area and many villagers still live without electricity. Union Digital Center was established by Ministry of Local Government, Rural Development and Cooperatives with A2I programed to provide services at the citizen's door step. The main focus of the center is to provide necessary ICT support to the rural people. The center is established under Public Private People's Partnership (PPP) modality and hosted by concerned Union Parishad under the supervision of Central Administration. The Union Parishad provides space (commonly one room attached or within the Union Parishad Building) and utility (electricity bill) for the center. Local Government Division coordinates with Cabinet Division and Bangladesh Computer Council to establish the basic ICT setup including computers, laptops, printers, multimedia projector, digital camera, webcam and solar panel. The entrepreneurs are free to install additional facilities to support business growth, at the same time, ensuring that the social sustainability of the center is achieved by delivering government information and services.

Entrepreneurs of the Centre

The center is operated by two local entrepreneurs (one is mail and the other is female) who are self-employed and motivated. They do not receive any remuneration from the government. There are some guidelines of appointing entrepreneurs from the deputy commissioner's office regarding adequate computer skills. They invest financially in the center and get proper profit share as per the contract made between the respective union parishad and entrepreneurs.

Management of UDC

7-9 members represent as managing committee of the UDC. The Chairman of concerned union parishad is the chairman of this committee. The duration of this committee is about 2 years. One-third of the members of the committee would be female. The role of the committee is as following:

- Selecting local entrepreneurs
- Buying equipment of UDC
- Selecting rate of charges for additional services provided by UDC
- Assisting the entrepreneurs for maintaining services
- Holding meetings regularly for reviewing the activities of UDC
- Strengthening the motivational activities among the rural community people for taking the services provided by the UDC

Current Status of UDC

According to Bangladesh Bureau of Statistics (BBS, 2014), the number of UDC operated is 4,492 whereas the aim number is 4,533. The rest 41 UDCs are closed and not functioning. A total of 3.91 million citizens are directly receiving information and services from UDC. UDCs reported to generate about BDT 4.65 million (over half a million dollars, USD 545,337) on a monthly basis (BBS, 2014).

Bangladesh National Digital Architecture

The Bangladesh National Digital Architecture (BNDA) is one of the sub-projects of the Leveraging ICT for Growth, Employment and Governance Project. The objectives of this program include developing strategies for providing systematic Digital Services, cutting related development costs, and improving service quality by streamlining work processes. BNDA is developed based on the TOGAF Standard, a standard of The Open Group.

BNDA consists of the following components:

- Deploying a national enterprise architecture portal and data storage,
- Building a shared network for national Digital Services and achieving data standardization,
- Implementing a public service platform, and
- Developing a governance system for the national enterprise architecture

The BNDA is a strategic planning tool to turn visions and strategies related to government administration and service provision into reality using the "whole-of-government" approach and deliver effective, sustainable, comprehensive services. When running projects after switching to e-Government with the national enterprise architecture, the Bangladeshi government will pursue the followings under the common system adopting the components of the BNDA, based on the principle of standardization and simplification.

- Improving governance
- Cooperation and collaboration
- Optimizing costs
- Standardization
- Reusability
- Mature information systems
- Comprehensive development

The architecture areas of the BNDA include business, data, application, interoperability, mobility, technology and security. The Bangladesh government aims to achieve the following goals by adopting the national enterprise architecture.

- Utilize ICT under the vision of Digital Bangladesh to reduce TCV (time, costs, number of visits),
- Implement an interface that enables citizens to use government services intuitively,
- Deploy a common platform for government services that will be available in future,
- Share data centers, networks, service platforms, and the infrastructure of the National Enterprise Service Bus,
- Define common, acceptable standards and specifications to reduce procurement time and improve ICT quality,
- Increase the maturity of government agencies from an architectural perspective,
- Leverage and nurture skilled architecture experts to improve the quality of architecture designs, and
- Provide a long-term, sustainable roadmap for the holistic implementation of Digital Services across all branches of the government when pursuing the informatization of individual government agencies.

e-Service[1]

In Bangladesh, the term "e-Services" refers to the variety of online-based digital public services provided to businesses, government workers, and citizens. These include services like paying taxes online, applying for an e-passport, registering births and deaths, searching for land records, renewing a driver's license, and paying utility bills. Portals such as the Bangladesh National Portal, the A2I (Access to Information) program, and specialized

agency websites are used to deliver many of these. With the advent of e-services, public administration has become more transparent, processing times have decreased, and corruption opportunities have been reduced. However, there are significant regional differences in these services' quality and accessibility. Rural areas frequently experience slow service delivery because of poor connectivity and lack of awareness, while urban residents typically enjoy better access because of dependable internet and digital literacy.
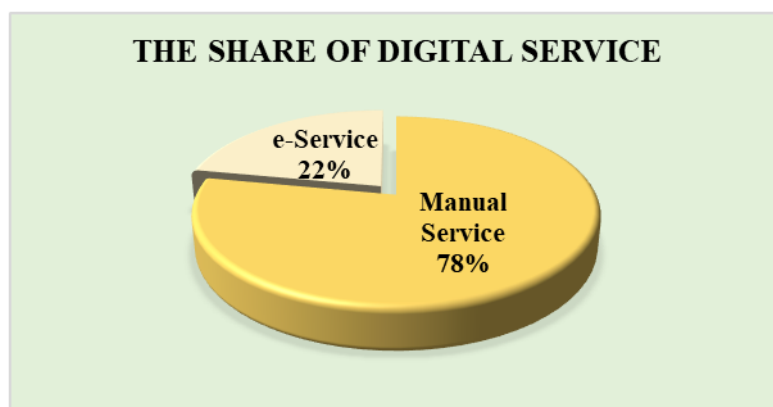

Figure 3.13: The Share of Digital Service
Source: The e-government Master plan for digital services 2018

The usability of many e-service portals is another issue; interfaces are frequently complicated, navigation is difficult, and services are rarely mobile device optimized, which is crucial given that the majority of people use smartphones to access the internet. Additionally, citizens must repeatedly submit the same documents for various services due to the limited integration between agency databases. A unified service platform and a national digital identity could greatly enhance interoperability and user experience. Furthermore, local digital service centers and awareness campaigns can aid in closing the usage gap in rural areas. Public confidence in e-services will be further increased by guaranteeing strong cybersecurity, frequent updates, and easily accessible grievance redressed procedures.

All things considered, Bangladesh has made significant strides in implementing online public services; however, the next stage is to guarantee inclusivity, simplification, and smooth integration amongst government agencies.

The Digital Service Accelerator Programme, a joint effort by a2i and the Cabinet Division, surveyed 53 ministries and divisions and 394 agencies to find 2,726 public services. Among them, 2,129 services are manual services and 597 services are Digital Services. In other words, about 22% of the public services are available online while 78% is provided offline. Most online public services are based on simple information retrieval.

Analysis of e-Services[1]

There are 365 services identified as available e-services. E-Services are discriminated by 23 categories: In this chapter we analyzed e-services by discriminating type of service and the service operation body. Also, we analyzed the tendency of services in each category. The followings are the result of the analysis of e-Services by each category.

Table 3.5: Citizen Services (G2C)

Service	Description	Operating Body
National ID Services	Online NID registration, correction, and verification	Election Commission
e-Passport	Online application and renewal of biometric passports	Department of Immigration and Passports
BRTA Services	Vehicle registration, license renewal, fee calculator	Bangladesh Road Transport Authority (BRTA)
Birth and Death Registration	Online registration and certificate download	Local Government Division
e-TIN Registration	Apply for and verify Taxpayer Identification Number	National Board of Revenue (NBR)
Online Tax Filing (e-return)	Income tax submission and assessment	NBR
Digital Land Services (e-Namjari)	Land mutation, records, khatian, map access	Ministry of Land
MyGov Platform	One-stop portal for 250+ services	A2I, Cabinet Division

Shohoz / Railway / Biman e-Ticketing	Purchase tickets for bus, train, or flights	BIWTA, BR, Biman Bangladesh Airlines
e-Health Services	Telemedicine, appointment booking, COVID-19 updates	Directorate General of Health Services

Source: e-government master plan for Digital Bangladesh 2018

Table 3.6 Business & Entrepreneur Services (G2B)

Service	Description	Operating Body
e-Tax & VAT Services	VAT registration, return filing, payment	NBR
Office of the Registrar of Joint Stock Companies (RJSC)	Company registration and compliance	Ministry of Commerce
BIDA One-Stop Service (OSS)	Investment approvals, licenses, permits	Bangladesh Investment Development Authority
Land Allocation in Industrial Areas (BSCIC)	Apply for land in industrial zones	BSCIC
E-Fire License System	Online application for fire safety approval	Bangladesh Fire Service
Import and Export Licensing (EPB)	Digital licensing for trade	Export Promotion Bureau

Source: e-government master plan for Digital Bangladesh 2018

Table 3.7 Government-to-Government (G2G)

Service	Description	Operating Body
e-Nothi	Digital file management system for government offices	Cabinet Division
Government ERP (iBAS++)	Budgeting, accounting, and payment system	Ministry of Finance
HRMIS for Government Employees	Personnel record management	Ministry of Public Administration
Government Email (gov.bd)	Secure email services for officials	Bangladesh Computer Council (BCC)
SP Dashboard	Law enforcement performance monitoring	Bangladesh Police
Audit Management System (e-Audit)	Digital audit trail and oversight	Office of the Comptroller and Auditor General

Source: e-government master plan for Digital Bangladesh 2018

Table 3.8 Education, Agriculture & Social Services

Sector	Digital Service	Description
Education	BdREN, e-Learning, Digital Classroom	University network, online classes
Agriculture	Krishi Call Center 16123, e-Krishok	Info on crops, fertilizers, weather
Social Welfare	Allowance Management System (G2P)	Digital disbursement of pensions, stipends

Source: e-government master plan for Digital Bangladesh 2018

Categories of e-Services[1]

Bangladesh's national portal offers 587 e-services and 71 mobile services. There are 23 categories for e- services and 5 for the categories of mobile services. The project team assessed 587 e-services as an ordinary citizen user and identified whether the services are accessible or not. Among 587 e-Services, 467 e-Services are on service.

Pruning identical services, there are 365 e-Services available. Multiple organization uses identical services which we call shared service such as e-GP, e-File Management (e-filing system, Nothi), Personnel Data Sheet, Bangladesh Education Boards, PMIS, eForm and iVAS. 42 services are simply providing information or links of PDF and radio channel. 307 e-Services are for citizen/business services and 50 e-Services are for government administration. 8 e-services are shared by multiple organizations. Following table shows the number of e-Services in each category.

Figure 3.14: The breakdown of e-Services available on Bangladesh's national porta
Sources: The e-government master plan for public services 2018

Admission

The admission category comprises 36 e-services. There are 28 e-Services accessible out of 36. Every service is either business- or citizen-centric. The majority of e-services in the admissions category have to do with university enrollment. There are many e-services that provide comparable services linked to admission. A unified information portal that offers links to each university's e-service and all admission-related information is preferable for potential users who might be students. The e-services listed below fall under the "Admission" category.

Table 3.9: e-Services of Admission

Institution/Service	Type of Service	Operating Body
Medical Admission	G2C	Directorate General of Health Services
Admission Process	G2C	University of Dhaka
Bangabandhu Sheikh Mujibur Rahman Agricultural University	G2C	BSMR Agricultural University
Bangabandhu Sheikh Mujibur Rahman Maritime University	G2C	BSMR Maritime University
Bangladesh Open University	G2C	Bangladesh Open University
Bangladesh Textile University	G2C	Bangladesh Textile University
Bangladesh University of Engineering	G2C	Bangladesh University of Engineering and Technology (BUET)
Barisal University	G2C	Barisal University
Begum Rokeya University	G2C	Begum Rokeya University
Chittagong Veterinary and Animal Sciences University	G2C	Chittagong Veterinary and Animal Sciences University
Comilla University	G2C	Comilla University
Dhaka University of Engineering and Technology	G2C	Dhaka University of Engineering and Technology
Islamic Arabic Universities	G2C	Islamic Arabic Universities
Jagannath University	G2C	Jagannath University
Jahangirnagar University	G2C	Jahangirnagar University
Jessore Science and Technology University	G2C	Jessore Science and Technology University
Maulana Bhashani University of Science and Technology	G2C	Maulana Bhashani University of Science and Technology
National Poet Kazi Nazrul Islam University	G2C	National Poet Kazi Nazrul Islam University
Noakhali Science and Technology University	G2C	Noakhali Science and Technology University
Online Admission (Institute of Cost and Management Accountants)	G2C / G2B	Institute of Cost and Management Accountants (ICMAB)
Online Admission Programs (National Maritime Institute)	G2C / G2B	National Maritime Institute
Patuakhali Science and Technology University	G2C	Patuakhali Science and Technology University
Rajshahi University of Engineering and Technology	G2C	Rajshahi University of Engineering and Technology (RUET)
Rangamati Science and Technology University	G2C	Rangamati Science and Technology University
Shahjalal University of Science and Technology	G2C	Shahjalal University of Science and Technology (SUST)

Sher-e-Bangla Agricultural University	G2C	Sher-e-Bangla Agricultural University
Sylhet Agricultural University	G2C	Sylhet Agricultural University
University of Chittagong Engineering and Technology	G2C	University of Chittagong Engineering and Technology

Source: e-government master plan for Digital Bangladesh 2018

Agriculture

The category of "Agriculture" comprises 21 e-services. Most e-services are either citizen- or business-centric, with two exceptions. Simple informational websites make up three of the e-services. "Personnel Data Sheet" is not included since it is a shared service.

There are a lot of e-services related to agriculture. An agriculture information portal that integrates all agricultural e-services into one system will work well. Below is a description of the e-services in "Agriculture".

Table 3.10: e-services in Agriculture

Service Name	Type of Service	Operating Body
Agricultural Research Management Information System	G2C / G2B	Bangladesh Agricultural Research Council
Climate Information Management System	G2C / G2B	Bangladesh Agricultural Research Council
BARC Archive	G2C / G2B	Bangladesh Agricultural Research Council
Bangladesh Rice Knowledge Bank	G2C / G2B	Bangladesh Rice Research Institute
Agriculture Call Center	G2C / G2B	Agriculture Information Service
Agriculture Information Service	G2C / G2B	Agriculture Information Service
Weather Information (BINA)	G2C / G2B	Bangladesh Institute of Nuclear Agriculture
E-marketing	G2C / G2B	Department of Agricultural Marketing
Crop Suitability and Zoning	G2C / G2B	Bangladesh Agricultural Research Council
Land Resource Information Management System	G2C / G2B	Bangladesh Agricultural Research Council
Agriculture Technology Database	G2C / G2B	Bangladesh Agricultural Research Council
National Information Sharing Mechanism on GPA Implementation	G2C / G2B	Bangladesh Agricultural Research Council
BMI Calculator	G2C / G2B	Bangladesh Applied Nutrition Research and Training Institute
Agricultural Ventilation	G2C / G2B	Ministry of Agriculture
Establishment of Hybrid Registration Trial	G2C / G2B	Ministry of Agriculture
Online Fertilizer Recommendation System	G2C / G2B	Ministry of Agriculture
Online Seed Test Result	G2C / G2B	Ministry of Agriculture
Fertilizer Recommendation Guide	G2C / G2B	Soil Resource Development Institute
Labor Management	G2G	Bangladesh Agricultural Research Institute

Source: e-government master plan for Digital Bangladesh 2018

Ask Your Question

The "Ask Your Question" category has nine e-services. Every service is for business- or citizen-centric purposes. "Complaints Management System" is a straightforward link that leads to a Google Form. As a shared service, the Grievance Redress System falls under the "Ask Your Question" category. The majority of e-services serve similar purposes and are implemented as various systems.

Table 3.11: e-services in Ask your Question

Service Name	Type of Service	Operating Body
Complaints Management System	G2C / G2B	National Human Rights Commission Bangladesh
Online Complain (Bureau of Manpower, Employment and Training)	G2C / G2B	Bureau of Manpower Employment and Training
Ask Your Finance Minister	G2C / G2B	Ministry of Commerce
Online Complain (Ministry of Expatriates' Welfare and Overseas Employment)	G2C / G2B	Ministry of Expatriates Welfare & Overseas Employment
Complaints (Ministry of Labor and Employment)	G2C / G2B	Ministry of Labour and Employment
Service Opportunity Opinion (Ministry of Science and Technology)	G2C / G2B	Ministry of Science and Technology
Online Complaints Facility (National Museum of Science and Technology)	G2C / G2B	National Museum Of Science and Technology
Complaints and Suggestions	G2C / G2B	Wage Earners' Welfare Board

Source: e-government master plan for Digital Bangladesh 2018

Digital Center

There is an e-service, 'All services in one address for the entrepreneur'. The type of the e-Service is G2C / G2B. It is operated by Eksheba.

All services in one address for the entrepreneur

Type of Service: G2C / G2B

Operating Body: Eksheba

Directory

19 of e-services are classified as 'Directory'. All services are citizen-centric or business-centric. 'Bengali Dictionary' is a simple downloadable link. There are digital library services, e-book and information providing services in this category. All e-services are citizen-centric or business-centric services.

Table 3.12: e-services in Directory

Service Name	Type of Service	Operating Body
Bengali Dictionary	G2C / G2B	ICT Division
e-Publication (Bangladesh Development Research Institute)	G2C / G2B	Bangladesh Institute of Development Studies
Bari Digital Library	G2C / G2B	Bangladesh Agricultural Research Institute Library
Publishing Database	G2C / G2B	Bangladesh Atomic Energy Commission
Digitization of BBS Publication	G2C / G2B	Bangladesh Bureau of Statistics
Interactive Digital Madrasah Textbooks	G2C / G2B	Bangladesh Madrasa Education Board
BANSDOC E-Book	G2C / G2B	Biotechnology National Information Cell
Innovation of Young Scientists and Science Club	G2C / G2B	Biotechnology National Information Cell
Online Books and Journals Search	G2C / G2B	Biotechnology National Information Cell
Public Opinion Survey (Department of Narcotics Control)	G2C / G2B	Department of Narcotics Control
Nikosh Converter	G2C / G2B	Department of Public Libraries
Public Library Portal	G2C / G2B	Department of Public Libraries
Book Cataloging System	G2C / G2B	Land Administration Training Center
Law of Bangladesh	G2C / G2B	Legislative and Parliamentary Affairs, Department of Law, Justice and Parliamentary Affairs
Online Library (food related)	G2C / G2B	Ministry of Food
Al Quran: Digital	G2C / G2B	Ministry of Religious Affairs
E-Library	G2C / G2B	Ministry of Women and Children Affairs
Banglapedia	G2C / G2B	National Encyclopedia of Bangladesh
e-Library (Public Works Department)	G2C / G2B	Public Works Department

Source: e-government master plan for Digital Bangladesh 2018

Education

There are 29 e-services in the category, 'Education'. 23 out of 29 e-services are citizen-centric or business-centric services. 5 e-services are for government administration. 'Bangladesh Education Boards' is a shared service. There are three services that are simply providing information. (Website of Bangladesh National Museum, Website of Directorate of Primary Education, Website of Road Transport and Highways Division)

Table 3.13: e-services in Education

Service Name	Type of Service	Operating Body
Board of Intermediate and Secondary Education, Comilla	G2C / G2B	Board of Intermediate and Secondary Education, Comilla
National Curriculum and Textbook Board	G2C / G2B	National Curriculum and Textbook Board
Website of Bangladesh National Museum	G2C / G2B	Bangladesh National Museum
Website of Directorate of Primary Education	G2C / G2B	Directorate of Primary Education
Website of Road Transport and Highways Division	G2C / G2B	Road Transport and Highways Division
e-learning systems	G2C / G2B	Bangladesh Atomic Energy Regulatory Authority
EiIn Application	G2C / G2B	Bangladesh Bureau of Educational Information & Statistics
Online ITEE Examination Registration Fees	G2C / G2B	Bangladesh IT Engineers Examination Center
BD schoolshala	G2C / G2B	BD Pathshala
Online HSC Practical Mark Entry Form	G2C / G2B	Board of Intermediate & Secondary Education, Dinajpur
Electronic Student Information Form	G2C / G2B	Board of Intermediate & Secondary Education, Rajshahi

Service Name	Type of Service	Operating Body
Online Examination Attendance	G2C / G2B	Board of Intermediate & Secondary Education, Rajshahi
e-TIF	G2C / G2B	Board of Intermediate and Secondary Education, Comilla
Website of Board of Intermediate and Secondary Education, Dinajpur	G2C / G2B	Board of Intermediate and Secondary Education, Dinajpur
Digital content of primary textbooks	G2C / G2B	Department of Information and Communication
Online Application Form	G2C / G2B	Directorate of Primary Education
Institute of Chartered Accountants of Bangladesh	G2C / G2B	Institute of Chartered Accountants of Bangladesh
Teachers.gov.bd	G2C / G2B	Ministry of Education
Al-Quran	G2C / G2B	Ministry of Religious Affairs
Books distributed	G2C / G2B	National Curriculum and Textbook Board
eBooks	G2C / G2B	National Curriculum and Textbook Board
National Maritime Institute	G2C / G2B	National Maritime Institute
Office of the Registrar of Joint Stock Companies and Firms	G2C / G2B	Office of the Registrar of Joint Stock Companies and Firms
ERP	G2G	Secondary and Higher Secondary Education Board, Dhaka
NASBCC	G2G	Bangladesh Computer Council
Personnel Data Sheet for Govt. High School Teachers (Directorate of Jute)	G2G	Department of Jute, Ministry of Textiles & Jute
Directorate of Primary Education Accounting System	G2G	Directorate of Primary Education
Prime Minister's Education Assistance Trust	G2G	Prime Minister's Education Assistance Trust

Source: e-government master plan for Digital Bangladesh 2018

Exam Results

8 e-Services are categorized as 'Exam Results'. All e-services are citizen-centric or business-centric services. The services are providing information of test results. It is better to have a central information providing portal related to education so that users do not have to navigate each service for each query. Admission, application of course, viewing curriculum and checking exam results needs to be integrated into single education portal.

Table 3.14: e-services in Exam Result

Service Name	Type of Service	Operating Body
BUET Exam Results	G2C / G2B	Bangladesh University of Engineering and Technology (BUET)
DU Exam Results	G2C / G2B	Dhaka University
Medical Examination Results	G2C / G2B	Directorate General of Health Services, Ministry of Health and Family Welfare
Education Board Web-based Result System For Institutions	G2C / G2B	Ministry of Education
HSC, Alim and Equivalent Exam Results	G2C / G2B	Ministry of Education, Intermediate and Secondary Education Boards Bangladesh
Result of Public Exam, Technical and Madrasa Education Department	G2C / G2B	Ministry of Education, Intermediate and Secondary Education Boards Bangladesh
SSC, Dakhil and Equivalent Exam Results	G2C / G2B	Ministry of Education, Intermediate and Secondary Education Boards Bangladesh

Source: e-government master plan for Digital Bangladesh 2018

Finance and Trade

There are 34 e-services related to finance and trade. Most e-Services are G2C or G2B. 'Online forex transaction monitoring system' is G2G. There is e-GP as shared service in the category. There are e-services for providing information of goods for trading. Some e-services are related to investment. There are bank related e-services.

Table 3.15: e-services in Finance and Trade

Service Name	Type of Service	Operating Body
Website of Bangladesh Investment Development Authority	G2C / G2B	Bangladesh Investment Development Authority (BIDA)
Website of Bangladesh Small and Cottage Industry Corporation	G2C / G2B	Bangladesh Small and Cottage Industry Corporation
Submit a complaint to the National Consumer Rights Protection Department	G2C / G2B	National Consumer Rights Protection Department
Website of Bangladesh Bank	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Bangladesh Bank Corporate Memory Management Systems	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh

Bangladesh Bank e-Return	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Bangladesh Bank e-tendering system	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Bangladesh Bank web upload	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Corporate memory management system	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
eReturns	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Prizebond Matching	G2C / G2B	Bangladesh Bank, Central Bank of Bangladesh
Land Requisition service	G2C / G2B	Bangladesh Economic Zones Authority
Currency Converter	G2C / G2B	Bangladesh High Commission Islamabad, Pakistan
General Provident Fund	G2C / G2B	Bangladesh Parjatan (Tourism) Corporation
Foreign Money Order (Bangladesh Postal Department)	G2C / G2B	Bangladesh Post Office
E-Tender	G2C / G2B	Bangladesh Power Development Board
E- Purji	G2C / G2B	Bangladesh Sugar & Food Industries Corporation
CSE Care	G2C / G2B	Chittagong Stock Exchange
Current Market Price (CSE)	G2C / G2B	Chittagong Stock Exchange
Market Depth (CSE)	G2C / G2B	Chittagong Stock Exchange
Market Summary (CSE)	G2C / G2B	Chittagong Stock Exchange
Departmental Debt Online	G2C / G2B	Cotton Development Board
eChallan (e-Shipment)	G2C / G2B	Department of Finance, Ministry of Finance
e-Auction (DESCO)	G2C / G2B	Dhaka Power Distribution Company Limited
Latest Stock Price (DSE)	G2C / G2B	Dhaka Stock Exchange
Market Statistics (DSE)	G2C / G2B	Dhaka Stock Exchange
Market Value (DSE)	G2C / G2B	Dhaka Stock Exchange
Monthly Review and Graph (DSE)	G2C / G2B	Dhaka Stock Exchange
Today's Market / Top 20 Shares (DSE)	G2C / G2B	Dhaka Stock Exchange
GIS based salt industry information	G2C / G2B	Nutrition International
E-auction	G2C / G2B	Power Grid Company of Bangladesh Ltd.
Online underwriting	G2C / G2B	Sadharan Bima Corporation
Online forex transaction monitoring system	G2G	Bangladesh Bank, Central Bank of Bangladesh

Source: e-government master plan for Digital Bangladesh 2018

Fisheries and Livestock

There are 5 e-services in the category, 'Fisheries and Livestock'. Four e-Services are citizen-centric or business-centric services and one service named 'Personnel Data Sheet' is a shared service.

Table 3.16: e-services fisheries and livestock

Service Name	Type of Service	Operating Body
Fish Advice System	G2C / G2B	Department of Fisheries
Licensing of fish products	G2C / G2B	Department of Fisheries
Livestock SMS services	G2C / G2B	Department of Livestock Services
E-Livestock	G2C / G2B	Directorate of Residential Resources

Source: e-government master plan for Digital Bangladesh 2018

Forms

3 of e-Services are about forms related service. All services are G2C or G2B. 'Government Forms' provides all kind of forms related to government services which can be classified as shared service. There is an e- service named 'eForm' which is classified as 'Online application' and 'Online Registration'. It is better to integrate these similar e-services into one integrated e-service for providing all the government related forms in single portal.

Table 3.17: e-services fisheries and livestock

Service Name	Type of Service	Operating Body
Citizen Corner (e-Form)	G2C / G2B	Land Record and Survey Department
Resources-Person's Information-Form (NAPD)	G2C / G2B	National Academy for Planning and Development

Source: e-government master plan for Digital Bangladesh 2018

Health Services

There are 9 e-Services categorized as 'Health Services'. 8 of e-Services are G2C or G2B whereas 1 service is G2G. 'Telemedicine' is a link leading to PDF.

Table 3.17: e-services in Health Services

Service Name	Type of Service	Operating Body
e-Health	G2C / G2B	Directorate General of Health Services (DGHS)
Telemedicine	G2C / G2B	Directorate General of Health Services (DGHS)
Antibiotic Guidelines (Bangabandhu Sheikh Mujib Medical University)	G2C / G2B	Bangabandhu Sheikh Mujib Medical University
Atomic Medical Online Service	G2C / G2B	Bangladesh Atomic Energy Commission
Online Applications	G2C / G2B	Department of Social Services
SS - Service Statistics	G2C / G2B	Directorate General of Family Planning Management Information System
E-Health Care	G2C / G2B	Directorate General of Health Services
Health, Population and Nutrition Toolkit	G2C / G2B	USAID
Appointment (Health Education and Family Welfare Division)	G2G	Ministry of Health and Family Welfare, Bangladesh

Source: e-government master plan for Digital Bangladesh 2018

Income Tax

There are 7 e-Services categorized as 'Income Tax'. 5 of the e-Services are G2C or G2B. There is a shared service, 'iVAS' which is a VAT e-Service. Many of the e-Services are operated by National Board of Revenue. Rest are run by Internal Resources Division and Bangladesh Road Transport Authority.

Table 3.18: e-services in Income tax

Service Name	Type of Service	Operating Body
National Board of Revenue	G2C / G2B	National Board of Revenue
Taxes Appellate Tribunal	G2C / G2B	Internal Resources Division, Ministry of Finance
Income Tax Online Filing	G2C / G2B	National Board of Revenue
Learn VAT Online	G2C / G2B	National Board of Revenue
NBR-Sonali Bank e-Payment Portal	G2C / G2B	National Board of Revenue

Source: e-government master plan for Digital Bangladesh 2018

Online Application

100 e-Services are classified as 'Online Application'. 73 e-Services are citizen-centric or business-centric services. Among 73 e-Services, 12 services are simply providing information without any interactive functions. 24 e-Services are G2G services and 3 e-Services are shared services. For the shared services, there are 'e-File Management (Nothi)', 'eForm', 'Election Commission.

Table 3.19: e-services in Online Application

Service Name	Type of Service	Operating Body
Bangladesh Film Censor Board	G2C / G2B	Bangladesh Film Censor Board
E-Fire License Application System	G2C / G2B	Bangladesh Fire Service and Civil Defense
Application for allocation of land in BISIC industrial area	G2C / G2B	Bangladesh Small and Cottage Industry Corporation
Department of Environment	G2C / G2B	Department of Environment
Homepage of Department of Environment	G2C / G2B	Department of Environment
Online Birth Registration Information System	G2C / G2B	Local Government Division
Office of The Chief Inspector of Boilers	G2C / G2B	Office of The Chief Inspector of Boilers
Bangladesh Film Archive	G2C / G2B	Bangladesh Film Archive
Bangladesh Fire Service and Civil Defense	G2C / G2B	Bangladesh Fire Service and Civil Defense
Bangladesh High Tech Park Authority	G2C / G2B	Bangladesh High Tech Park Authority
Bangladesh Ordnance Factories	G2C / G2B	Bangladesh Ordnance Factories
Bangladesh Standards and Testing Institution	G2C / G2B	BSTI
Online Essay Competition	G2C / G2B	Teletalk Bangladesh
Department of Labour	G2C / G2B	Department of Labour
Attendance Tracking System for Trainees	G2C / G2B	Department of Youth Development
Jatio Muktijoddha Council	G2C / G2B	Jatio Muktijoddha Council
National Productivity Organization	G2C / G2B	National Productivity Organization
NOC For Multi-Storied Building	G2C / G2B	Security Services Division
Bangladesh Telecommunication Regulatory Commission	G2C / G2B	BTRC
E-Licensing System	G2C / G2B	Bangladesh Atomic Energy Regulatory Authority
GIS Applications	G2C / G2B	Bangladesh Bureau of Statistics
Website of Bangladesh Council of Scientific and Industrial Research	G2C / G2B	BCSIR
Website of Bangladesh Embassy (Beijing, Berlin, Stockholm, Tokyo)	G2C / G2B	Respective Embassies

Website of Bangladesh High Commission (London, Singapore)	G2C / G2B	Respective High Commissions
Online Loan Application	G2C / G2B	Bangladesh House Building Finance Corporation
Online Application of Education Scholarship	G2C / G2B	Bangladesh Karmachari Kallyan Board
BLRI Feed Master	G2C / G2B	Bangladesh Livestock Research Institute
Executive Summary Submission	G2C / G2B	Bangladesh Livestock Research Institute
Scheduled Application Form for Collection	G2C / G2B	BANSDOC
Online Police Clearance Certificate	G2C / G2B	Bangladesh Police
Industry Manpower Report	G2C / G2B	BSCIC
Online Product Order	G2C / G2B	Bangladesh Steel & Engineering Corporation
Online Tea License Application	G2C / G2B	Bangladesh Tea Board
Website of Board of Intermediate and Secondary Education, Dhaka	G2C / G2B	BISE Dhaka
Website of Bureau of Manpower, Employment and Training	G2C / G2B	BMET
Website of Civil Aviation Authority of Bangladesh	G2C / G2B	CAAB
Website of Department of Immigration and Passports	G2C / G2B	DIP
Online Service for Patent/Design/Trademark/GI Product	G2C / G2B	DPDT
Online Gazette Archive	G2C / G2B	Department of Printing and Publications
Online Application (Shipping)	G2C / G2B	Department of Shipping
Skills Development Training	G2C / G2B	Department of Social Services
Social Security Program (MIS)	G2C / G2B	Department of Social Welfare
Inland Ship Management	G2C / G2B	Department of Transportation
VGD Program Beneficiary Application	G2C / G2B	Department of Women Affairs
Online Application (Import and Export Control)	G2C / G2B	Directorate of Import and Export Control
Online Transfer Application (techedu)	G2C / G2B	Directorate of Technical Education
Online Application in Directorate of Textiles	G2C / G2B	Directorate of Textiles
Aid Information Management System (AIMS)	G2C / G2B	Economic Relations Division
Bangladesh-Sweden Trust Fund	G2C / G2B	Economic Relations Division
Scholarship & Fellowship	G2C / G2B	Economic Relations Division
Fire Fighting and Civil Defense Department	G2C / G2B	Fire Fighting and Civil Defense Department
Online Application for Scholarships and Donation	G2C / G2B	ICT Division
Online Application Receive	G2C / G2B	Jatio Muktijoddha Council
National E-Service System	G2C / G2B	Legislative and Parliamentary Division
CPP Disaster Information System	G2C / G2B	Ministry of Disaster Management and Relief
Digitalized Information of Freedom Fighter	G2C / G2B	Ministry of Liberation War Affairs
E-Application (Ministry of Public Administration)	G2C / G2B	Ministry of Public Administration
Migration Loan Application Form	G2C / G2B	Wage Earners' Welfare Board
Primary Application for Youth Loan	G2C / G2B	Youth Development Department
Online Secondary Data Collection	G2G	Bangladesh Bureau of Statistics
E-Delegate	G2G	Bangladesh Permanent Mission to the UN
Unite Conferences Portal	G2G	Bangladesh Permanent Mission to the UN
PMIS (PDS)	G2G	Department of Environment
ERP (Department of Fisheries)	G2G	Department of Fisheries
Case Management System (DSS)	G2G	Department of Social Services
Audit Management System (DPDC)	G2G	Dhaka Power Distribution Company Ltd.
Audit Management System (AMS)	G2G	Directorate General of Food
Case Database	G2G	Directorate General of Food
VGD Program	G2G	Directorate of Women Affairs
Information Repository	G2G	Economic Relations Division
PMIS (EGCB)	G2G	Electricity Generation Company of Bangladesh Ltd.
Digital Case Management System	G2G	Financial Institutions Division
Basic Social Services Assessment	G2G	IMED
Logistic Support System	G2G	Ministry of Fisheries and Livestock
Appointments (Health)	G2G	Ministry of Health and Family Welfare
ICT Support System	G2G	Ministry of Labour and Employment
Employee Payroll Database	G2G	Ministry of Land
Renewable Energy Data Entry	G2G	Ministry of Power, Energy and Mineral Resources
Application for Bangabandhu Science and Technology Fellowship	G2G	Ministry of Science and Technology
Managing Violence Against Women and Children	G2G	Ministry of Women and Children Affairs
Meeting Report System	G2G	Power Division
Ansar & VDP ERP	G2G	Security Services Division
BPC ERP	G2G	Bangladesh Parjatan Corporation

Source: e-government master plan for Digital Bangladesh 2018

Online Registration

There are 22 e-Services categorized as 'Online Registration'. 17 e-Services are citizen-centric or business- centric services. Rest are G2G services. 'Electronic Form Fill-up' is a shared service. 'Website of National Academy for Planning and Development' is a homepage that provides information.

Table 3.20: Online Registration G2C / G2B Services

Service Name	Type of Service	Operating Body
Website of Election Commission	G2C / G2B	Election Commission
Website of National Museum of Science and Technology	G2C / G2B	National Museum of Science and Technology
Website of National Academy for Planning and Development	G2C / G2B	National Academy for Planning and Development
Visa Registration System under BOI	G2C / G2B	Bangladesh Investment Development Authority
BISIC Industrial Unit Registration	G2C / G2B	Bangladesh Small and Cottage Industry Corporation
JSC Form Fill-up (Sylhet Board)	G2C / G2B	Board of Intermediate & Secondary Education, Sylhet
J.S.C. Electronic Form Fill-up	G2C / G2B	Board of Intermediate and Secondary Education, Dinajpur
Department of Printing Publications	G2C / G2B	Department of Printing Publications
PDS for Govt. High School Teacher (DSHE)	G2C / G2B	Directorate of Secondary and Higher Education
Online Registration	G2C / G2B	Land Administration Training Centre
Online Trade Union Registration	G2C / G2B	Ministry of Labour and Employment
Preregistration of Hajj Travelers	G2C / G2B	Ministry of Religious Affairs
Company Registration	G2C / G2B	Office of the Registrar of Joint Stock Companies and Firms
Rajshahi Unnayan Kartipakkho Online Portal	G2C / G2B	Rajshahi Development Authority
WiFi (Rajshahi Medical College)	G2C / G2B	Rajshahi Medical College
Membership Registration	G2C / G2B	Wage Earners' Welfare Board

Source: e-government master plan for Digital Bangladesh 2018

G2G Services

Service Name	Type of Service	Operating Body
Online Application & e-Filing System	G2G	Board of Intermediate and Secondary Education, Dhaka
Ministry of Public Administration PMIS (all cadre)	G2G	Ministry of Public Administration
PMIS (Administration Cadre)	G2G	Public Administration Computer Center
ERP Login	G2G	Wage Earners' Welfare Board
Worker Wing Login	G2G	Wage Earners' Welfare Board

Source: e-government master plan for Digital Bangladesh 2018

Passport, Visa and Immigration

There are 7 e-Services in 'Passport, Visa and Immigration'. All e-Services in the category are G2C or G2B services. The service named 'Visa Policy' is a link of PDF.

Table 3.21: e-services in Passport, visa and Immigration

Service Name	Type of Service	Operating Body
Bangladesh Police	G2C / G2B	Bangladesh Police
Department of Immigration and Passports	G2C / G2B	Department of Immigration and Passports
Online Visa Verification	G2C / G2B	Bureau of Manpower, Employment and Training
Foreign Travel Information	G2C / G2B	Bangladesh Atomic Energy Commission
VISA Assistance Service	G2C / G2B	Bangladesh Economic Zones Authority (BEZA)
E-Visa Link	G2C / G2B	Ministry of Foreign Affairs
Visa Policy	G2C / G2B	Department of Immigration and Passports

Source: e-government master plan for Digital Bangladesh 2018

Postal and Courier

'Bangladesh Post Online' is operated by Bangladesh Post Office. It is a citizen-centric or business-centric services. 'Website of National Savings Directorate' provides information and have some of interactive functions. 'Online Letter Process' is a G2G service. It is seen only login page.

Table 3.22: e-services in Postal and Courier

Service Name	Type of Service	Operating Body
Bangladesh Post Online	G2C / G2B	Bangladesh Post Office
Website of National Savings Directorate	G2C / G2B	National Savings Directorate
Online Letter Process	G2G	Bangladesh Post Office

Source: e-government master plan for Digital Bangladesh 2018

Radio, TV News

There are 7 e-Services in the category, 'Radio, TV News'. All services are G2C / G2B. The services provide radio channels or TV video streaming. However, there are no other function in the services. All services are attached in the website of Bangladesh Betar.

Table 3.23: e-services in Radio, TV News

Service Name	Type of Service	Operating Body
Bangladesh Betar Arabic News	G2C / G2B	Bangladesh Betar
Bangladesh Betar Bengali News	G2C / G2B	Bangladesh Betar
Bangladesh Betar English News	G2C / G2B	Bangladesh Betar
Bangladesh Betar Hindi News	G2C / G2B	Bangladesh Betar
Bangladesh Betar Live AM Radio	G2C / G2B	Bangladesh Betar
Bangladesh Betar Live FM Radio	G2C / G2B	Bangladesh Betar
Bangladesh Television	G2C / G2B	Bangladesh Betar

Source: e-government master plan for Digital Bangladesh 2018

Recruitment

12 of e-Services are categorized as 'Recruitment'. All e-Services except one are G2C or G2B services. 'Human Resource Management System' run by Urban Development Directorate is a G2G service. 'Model Application Form for Government Services' is a link of PDF.

Many services related to recruitment are posted individually. It will be effective if there is a central human resource management that handles not only recruitment process but also training program for citizen.

Table 3.24: e-services in Recruitment

Service Name	Type of Service	Operating Body
BADC recruitment application	G2C / G2B	Bangladesh Agricultural Development Corporation, Ministry of Agriculture
Recruitment application link (BIWTA)	G2C / G2B	Bangladesh Inland Water Transport Authority, Ministry of Shipping
PSC Job Application	G2C / G2B	Bangladesh Public Service Commission
Recruitment Notice	G2C / G2B	Bangladesh Steel & Engineering Corporation
Online Job Application	G2C / G2B	Bangladesh Water Development Board
Online Job Application (Chittagong Port Authority)	G2C / G2B	Chittagong Port Authority
Job Application	G2C / G2B	Department of Land Record and Surveys
Online Recruitment	G2C / G2B	Department of Livestock Services
NAPD Job Portal	G2C / G2B	National Academy for Planning and Development
e-Recruitment (PKSF)	G2C / G2B	Palli Karma-Sahayak Foundation
Human Resource Management System	G2C / G2B	Urban Development Directorate, Ministry of Housing and Public Works

Source: e-government master plan for Digital Bangladesh 2018

Ticket Booking and Purchase

There are 11 e-Services related to ticket booking and purchasing. Most e-Services except two are citizen-centric or business-centric services. Two e-Services which are G2G are services for booking conference room. E-Services in this category are for booking railway ticket, airline ticket, resort and other transportation ticket. Two e-Services simply provide information with no other interactive function. ('Website of Bangladesh Railway', 'Purchase of car from Progress Industries'

Table 3.25: e-services in Ticket Booking and Purchase

Service	Type of Service	Operating Body
Shohoz online ticket booking	G2C / G2B	Bangladesh Inland Water Transport Authority, Ministry of Shipping

Bangladesh Railway e-Ticketing Service	G2C / G2B	Bangladesh Railway
Biman e-ticketing service	G2C / G2B	Biman Bangladesh Airlines
Website of Bangladesh Railway	G2C / G2B	Bangladesh Railway
Purchase of car from Progress Industries	G2C / G2B	Bangladesh Steel and Engineering Corporation, Ministry of Industries
e-Ticketing (Novo Theater)	G2C / G2B	Bangabandhu Sheikh Mujibur Rahman Novo Theater
Bangladesh People and Crafts Foundation (Sonargaon Museum) e-Ticket	G2C / G2B	Bangladesh Folk Art & Crafts Foundation
Rapid Pass (Smart Card)	G2C / G2B	Bangladesh Road Transport Corporation
Online Resort Booking	G2C / G2B	Bangladesh Tea Board
Online booking for conference room	G2G	Bangladesh Agricultural Research Council
Conference room booking system	G2G	Ministry of Fisheries and Livestock

Source: e-government master plan for Digital Bangladesh 2018

Training

10 e-services are categorized as 'Training' services. 6 of the e-Services are citizen-centric or business-centric services. 4 e-Services are for government administration. 'Cooperative member's online registration' provides only information of training program.

Table 3.26: e-services in Training

Service Name	Type of Service	Operating Body
National Social Service Academy Training Management	G2C / G2B	National Academy of Social Services
National Agriculture Training Academy	G2C / G2B	National Agriculture Training Academy
Cooperative Members Online Registration	G2C / G2B	Department of Cooperatives - Government of the People's Republic of Bangladesh
Training Management System	G2C / G2B	Bangladesh Computer Council
Cooperative Members Online Registration	G2C / G2B	Cooperative Department
E-Training Management	G2C / G2B	Department of Fisheries
Foreign Tour Management System	G2G	Health Services Division
Overseas Training Tracking System	G2G	Statistics and Informatics Division
Project Tracking System	G2G	Bangladesh Computer Council
Overseas Visit Tracker	G2G	Statistics and Informatics Division

Source: e-government master plan for Digital Bangladesh 2018

Treasury Invoice

'Online Chalan Verification' is an e-Service categorized as 'Treasury Invoice'. The e-Service is G2C / G2B service that is operated by Office of the Controller General of Accounts.

Online Chalan Verification
- Type of Service: G2C / G2B
- Operating Body: Office of the Controller General of Accounts

Utility Bills

There are 11 e-Services for utility bills. Most e-Services except for one are citizen services. There are services related to water supply and sewage, electricity, gas and internet. It is more efficient to have a central e-Service that can manage various kinds of utility bills within each municipality level.

Table 3.27: e-services in Utility Bills

Service Name	Type of Service	Operating Body
E-Bill (Chattogram WASA)	G2C / G2B	Chittagong Water Supply and Sewerage Authority
DESCO	G2C / G2B	Dhaka Electric Supply Company
Website of Dhaka Water Supply and Sewerage Authority	G2C / G2B	Dhaka Water Supply and Sewerage Authority
Website of Dhaka Power Distribution Company Limited	G2C / G2B	Dhaka Power Distribution Company Limited
Website of Titas Gas Transmission & Distribution Company Limited	G2C / G2B	Titas Gas Transmission & Distribution Company Limited
Website of West Zone Power Distribution Company Ltd.	G2C / G2B	West Zone Power Distribution Company Ltd.
Website of Dhaka Power Distribution Company Limited	G2C / G2B	Dhaka Power Distribution Company Limited
Bill Payment (BTCL)	G2C / G2B	Bangladesh Telecommunication Company Limited

BTCL ADSL Internet bill	G2C / G2B	Bangladesh Telecommunication Company Limited
Khulna Development Authority	G2C / G2B	Khulna Development Authority
BSTI Billing System	G2G	Bangladesh Standards and Testing Institution

Source: e-government master plan for Digital Bangladesh 2018

Vehicle Services

8 of e-Services are categorized as 'Vehicle Services'. 'Website of Rupantarita Prakritik Gas Company Limited' has no interactive service but providing information. 'Online Licensing' operated by Department of Inspection for Factories and Establishments and 'Online Vehicle Recovery System' run by Ministry of Textile and Jute are G2G services. Rest of the e-Services are G2C or G2B services.

Table 3.28: e-services in vehicle Services

Service Name	Type of Service	Operating Body
Website of Rupantarita Prakritik Gas Company Limited	G2C / G2B	Rupantarita Prakritik Gas Company Limited
Fee Calculator for BRTA	G2C / G2B	Bangladesh Road Transport Authority
Online Payment Gateway for Motor Vehicle Taxes & Fees	G2C / G2B	Bangladesh Road Transport Authority
Digital Map of Local Government Engineering Department	G2C / G2B	Local Government Engineering Department
Road Database Local Government Engineering Department	G2C / G2B	Local Government Engineering Department
Online Travel Agency	G2C / G2B	Ministry of Civil Aviation and Tourism
Online Licensing	G2G	Department of Inspection for Factories and Establishments
Online Vehicle Recovery System	G2G	Ministry of Textile and Jute

Source: e-government master plan for Digital Bangladesh 2018

Digital Services[1]

G2G service aims to improve services and public administration for government internal administration. G2G service is classified as follows.
- Shared Services
- Common Services
- Ministerial Services

The services listed below are list of prioritized initiatives which can be implemented sequential order according to priority.

Table 3.29: Digital Services of e-governance

N.	Digital Service	Category	Duration
1	National Statistics Data Warehouse – Priority Initiative	Ministerial	Short term
2	ICT Employment Management (Government ERP)	Shared	Short term
3	Public Asset Management System	Shared	Short term
4	Training Management System	Shared	Short term
5	Unified Library Management System	Shared	Short term
6	Integrated Budget and Accounting System	Common	Short term
7	Project Management Information System	Common	Short term
8	Performance Management System	Common	Mid term
9	Electronic Human Resources Management System	Common	Short term
10	Integrated e-Document and Contents Management System	Shared	Mid term
11	Public Information Sharing System	Shared	Long term
12	Audit and Internal Control System	Ministerial	Short term

Source: e-government master plan for Digital Bangladesh 2018

National Statistical Data Warehouse

Through the effective use of statistical and analytical data, the National Statistical Data Warehouse is a crucial project intended to strengthen evidence-based policymaking and enhance service delivery. This system, which is led by the Bangladesh Bureau of Statistics (BBS), offers high-quality, timely, and pertinent statistical data to assist with national development plans. The platform helps both public and private organizations make data-driven decisions by providing access to extensive datasets.

The model looks to the future and imagines a National Statistics Data Warehouse that is driven by data mining and big data technologies. This change will entail combining cutting-edge data processing methods with the creation of a statistical information service that can provide intricate insights in a timely and precise manner.

By enabling policymakers to model scenarios, examine patterns, and predict results, a Decision Support System (DSS) based on big data infrastructure will enhance national governance and strategic planning. Furthermore, the creation of a Shared Service Platform will improve interoperability and cost-effectiveness by making it easier for government agencies to gather, store, and distribute vast amounts of data.

This initiative is anticipated to have a variety of advantages. First and foremost, it seeks to increase the number of citizens who have access to government information and services while drastically cutting down on the time, expense, and necessity of in-person visits to government offices. Second, it aims to increase citizen participation in governance by utilizing ICT to enable people to interact with and participate in decision-making processes. Thirdly, because data-driven systems reduce human discretion and increase public trust, the platform is intended to improve accountability, transparency, and responsiveness at all governmental levels. As a final goal of the larger Digital Bangladesh vision, the system hopes to improve the nation's standing abroad by demonstrating its dedication to modern public administration, digital transformation, and good governance.

Integrated Budget and Accounting System

One important element of Bangladesh's Public Financial Management (PFM) reforms is the Integrated Budget and Accounting System, or iBAS++. This system, which is run by the Finance Division, has been improved over time as part of the PFM Reform Strategy 2016–2021. By simplifying procedures associated with budget preparation, execution, and implementation, iBAS++ aims to improve the management of public finances. The Budget Implementation Module, the implementation of a new accounting classification system, and the anticipated rollout to local government entities are among its essential features. These advancements are intended to increase transparency, guarantee better control over public spending, and improve the timeliness and accuracy of financial data.

Experts advise that future integration with related systems should be taken into consideration, even though iBAS++ is not currently integrated with other significant systems, such as the electronic Government Procurement (e-GP) platform. A more unified digital financial management infrastructure would be supported by such integration, which would also help cut down on redundant work and avoid needless system modifications once the PFM reform agenda is finished. Features like financial set management and sophisticated financial and operational reporting tools are also anticipated to be included in iBAS++'s next model. By enabling real-time, daily financial and management reporting, these enhancements hope to decrease reporting time and boost accountability. Additionally, the improved system will encourage more effective and strategic budget planning across government agencies and support performance evaluation against budgetary allocations.

Project Management Information System

A comprehensive digital initiative, the Project Management Information System (PMIS) aims to improve the accountability, transparency, and efficiency of project implementation in Bangladesh. The Implementation Monitoring and Evaluation Division (IMED) is in charge of this system, which is presently being used as a pilot project. By improving stakeholder communication, guaranteeing better quality control, and fortifying risk management throughout the project lifecycle, PMIS aims to enable IMED to fulfill its mandate more successfully. PMIS seeks to reduce the need for physical inspections by digitizing project monitoring and evaluation procedures. This will cut down on the amount of time, money, and frequency of on-site visits. By using precise and traceable information logs, it also aims to prevent corruption by making sure that any modifications made to project data are documented and subject to audit.

PMIS's future model calls for a completely automated, end-to-end project management system that easily connects with other government platforms like e-GP (electronic government procurement) and iBAS++ (Integrated Budget and Accounting System). A user-friendly project management portal with dashboards and customization tools for real-time data visualization and decision-making support will also be part of it. Numerous advantages are anticipated from the system, including improved proactive risk and quality management, streamlined monitoring and evaluation procedures, and better overall expenditure management by coordinating project execution with budgeting frameworks. Ultimately, by leveraging the power of digital technology to advance efficiency, integrity, and accountability, the PMIS initiative has the potential to revolutionize public project governance in Bangladesh.

Public Asset Management System

A comprehensive digital platform called the Public Asset Management System (PAMS) was created to manage assets owned by the government, including buildings, land, and public spaces. It keeps thorough records of every asset's maintenance history, lifecycle events, and current condition. The system ensures financial and procurement-related transparency and coordination by being integrated with important government platforms like e-GP (electronic government procurement) and iBAS++ (the Integrated Budget and Accounting System). The relevant ministry or division that owns or manages the assets bears primary responsibility for monitoring and running this system.

The system is expected to develop into a comprehensive asset lifecycle management tool in the future, encompassing every phase of an asset's lifecycle, from purchase, transfer, repair, depreciation, and use to abandonment, disposal, or sale. Additionally, it will include online lease information management, giving stakeholders and citizens digital access to lease-related services. In order to ensure accountability and traceability at every stage, the future model incorporates end-to-end information management, beginning with acquisition and continuing through final disposal.

There are numerous important advantages to putting this cutting-edge system into place. First off, because asset availability and condition are centrally monitored, it will help cut down on government spending by avoiding needless purchases and reuse of current assets. Second, it improves asset tracking and monitoring in real time, which makes it simpler to identify and address asset loss, theft, or movement. Last but not least, the system will greatly improve administrative efficiency by offering a centralized and transparent digital record, reducing the time and labor required for asset identification, reporting, and auditing. All things considered, the Public Asset Management System is an essential instrument for guaranteeing accountability, openness, and cost effectiveness in the administration of public resources.

Performance Management System

The goal of the Bangladesh Performance Management System (BPMS) is to fully digitize the Annual Performance Agreement (APA) process in order to modernize and improve the effectiveness of public sector performance. The system's primary goal is to automate and streamline all APA-related processes in accordance with the larger framework of performance management implementation. This system, which is led by the Cabinet Division, makes sure that the procedures for performance planning and evaluation are more efficient and data-driven.

A comprehensive platform comprising elements like Dashboard and Analytical Tools, Monitoring and Reporting Mechanisms, Annual Performance Agreement Management, Annual Performance Review Management, and Integration with Other Government Systems is what the BPMS's future model aims to achieve. Together, these characteristics will enable ministries and agencies to effectively plan, track, evaluate, and communicate their performance goals and results.

Numerous advantages are anticipated from the system. In the first place, it will drastically cut down on the time, expense, and in-person visits needed to process performance reviews and agreements. Second, by offering real-time data and unambiguous visibility into progress and performance gaps, it will contribute to the improvement of government institutions' accountability, transparency, and efficiency. Last but not least, the system will facilitate the creation of a rolling plan by permitting continuous monitoring and reporting. This will assist institutions in continuously evaluating and improving their strategies, which should improve the general performance of public administration in Bangladesh.

Electronic Human Resources Management System

For government officials, the Electronic Human Resources Management System (e-HRMS) is a digital platform that includes all necessary HR functions to effectively manage the full HR lifecycle. HR administration, payroll processing, performance reviews, training and development, and other service-related tasks for public servants are all integrated into this system. One important aspect of the system is its policy support feature, which gathers and examines statistics pertaining to HR tasks to facilitate data-driven decision-making. This aids in the creation and application of logical, capacity-driven, performance-based HR policies.

The Ministry of Public Administration is the main agency in charge of the system. The system's future model seeks to offer sophisticated capabilities to pinpoint the exact HR needs required to achieve long-term organizational objectives. This entails projecting the number of employees needed, the requisite education and training, and the related expenses. Additionally, the system will facilitate in-depth examination of workforce data, including wage structures, employee placement, and recruitment trends. It is intended to provide thorough supervision of specialized tasks like stipend and allowance management in addition to general HR procedures.

The e-HRMS is anticipated to have significant advantages. The system will drastically lower the operational costs associated with basic personnel management by promoting a paperless workplace. HR staff will be able to concentrate on strategic and value-adding tasks since routine and repetitive HR tasks can be automated to process data more quickly and accurately. The system will also give line managers more power and flexibility and allow for real-time responses to employee needs. By encouraging openness, responsiveness, and efficiency, this empowerment is anticipated to change the organizational culture and raise overall employee satisfaction. By reducing the workload associated with non-strategic administrative duties and better coordinating HR operations with the organization's strategic goals, e-HRMS will ultimately improve performance.

Integrated e-Document and Contents Management System

An essential starting point for improving the effectiveness of government operations and the caliber of digital services is the Integrated e-Document and Contents Management System. This system, which is led by the Cabinet Division, aims to digitize all government documents and turn them into digital content that is easily accessible. It makes it easy to share documents and other content inside and outside of government organizations, which promotes increased cooperation and openness. The full electronic integration and management of all document types produced during government operations is part of the system's future vision. This includes the ability to create, process, approve, distribute, store, and eventually dispose of documents all through electronic means.

Online services like document numbering, transmission and distribution tracking, and archiving on large electronic media in a standardized database (DB) format will all be supported by the system. This will make it easier for users to find and use the information they require by facilitating quick and accurate document retrieval. Consequently, it is anticipated to greatly increase productivity by facilitating rapid document viewing, efficient searching, and enhanced user information exchange. Additionally, the system will help create a more orderly and eco-friendly office space by decreasing the need for physical paper storage. All things considered, this project is a significant step toward implementing digital transformation to create a government that is quicker, smarter, and more effective.

Public Information Sharing System

In order to achieve a truly paperless administration, facilitate real-time collaboration among government agencies, and increase public convenience, the Public Information Sharing System is a digital initiative. The old requirement for citizens to gather, carry, and turn in physical documents to different offices has been replaced by this system, which enables government officials to access and validate relevant information online. The system, which is overseen by the Cabinet Division, is intended to facilitate the smooth exchange of administrative data amongst various government agencies and optimize business procedures. It calls for the establishment of an online administrative information inquiry service that can handle a variety of documents needed for administrative and civil matters.

In addition to streamlining internal government processes, this future model would guarantee more effective service access for citizens. By reducing bureaucratic redundancies and delays, the expected benefits include an overall improvement in the quality of public service. The system helps reduce the cost and manpower involved in issuing and storing paper certificates by decreasing reliance on physical paperwork. A more responsive and economical government will result from improving accountability and service delivery by directly integrating the staff in charge of document issuance into the system.

Audit and Internal Control System

With its emphasis on risk-based auditing and real-time monitoring, the Audit and Internal Control System marks a substantial departure from conventional auditing methods. This change, led by Bangladesh's Comptroller and Auditor General, intends to improve audits' efficacy and responsiveness by utilizing cutting-edge IT tools and integrating internal control systems. The future model aims to create a better auditing framework that recognizes the close connection between IT and traditional auditing. In order to facilitate a unified and effective oversight process, it intends to create a smooth integration between current audit monitoring systems and IT audit platforms. Additionally, the system is built to facilitate ongoing post-accounting monitoring, guaranteeing that IT and financial operations are continuously and continuously examined. This change has a number of important advantages. The system promotes accountability and transparency in government operations by facilitating continuous monitoring, which guarantees the availability of timely, accurate, and trustworthy information. Furthermore, the computerization of audit administrative tasks greatly increases productivity by decreasing manual labor and lowering the possibility of human error. In the end, the Audit and Internal Control System establishes the framework for a public financial management ecosystem in Bangladesh that is more open, technologically advanced, and performance-focused.

Training Management System

The main hub for managing all of an organization's training activities is the Training Management System (TMS). It allows for more effective management and makes a substantial contribution to the institution's capacity building by streamlining and integrating all facets of training activities. The TMS, which is created and maintained under the direction of the relevant Ministry or Division, provides a single platform for organizing, carrying out, and overseeing training initiatives, thereby removing the need for several disparate tools.

In its future model, the system will incorporate a Course Management System that allows organizations to publish training courses online, making access easier and more transparent. A Customer Relationship Management (CRM) component will be introduced to manage information about trainees, trainers, administrative

staff, and other stakeholders in a structured and accessible manner. Additionally, a Reporting System will be embedded to generate real-time statistical data, facilitating better analysis, decision-making, and policy development. Furthermore, a Learning Data Management System will be responsible for storing and organizing all training-related materials, including documents, videos, and e-learning content, ensuring that knowledge resources are preserved and easily retrievable.

The ability to run well-planned training programs without depending on several platforms, thus lowering administrative burden, is one of the anticipated advantages of this integrated system. It will ultimately lead to increased efficiency and effectiveness in institutional capacity development and save a significant amount of time in managing training logistics and coordination. The TMS facilitates professional development and ongoing learning in a scalable and sustainable way by centralizing and digitizing training management.

Unified Library Management System

Many organizations currently run separate library management systems, which frequently results in inefficiencies, effort duplication, and challenges when it comes to sharing information. It is suggested that all relevant ministries and divisions implement a Unified Library Management System (ULMS) in order to address these issues. All library-related functions, such as cataloging, circulation, acquisitions, and user management, would be streamlined and centralized by this integrated system. The ministries or departments in charge of each library would be primarily responsible for putting this system into place.

Advanced technologies like Radio Frequency Identification (RFID) for automated identification and data collection would be incorporated into the ULMS model of the future. This would make it possible to track, manage, and secure library materials more effectively. The Online Library Catalogue, a centralized gateway that allows users to search across the entire collection including books, theses, and multimedia resources like audio recordings and videos would be a key component of the system. Additionally, this online portal would make library services more accessible and user-friendly by enabling users to remotely reserve books and other materials.

The implementation of a unified library management system is anticipated to yield significant advantages. It would produce a structured and orderly online library environment that decreases manual labor and increases precision. Additionally, when libraries cooperate or share resources, the unified system would facilitate smooth inter-organizational information sharing, removing the need for extra integration work. Additionally, by automatically recognizing returned items and updating the system in real-time, RFID would streamline the book return procedure. RFID-based systems would also make it easier for users to search the library's collection. All things considered, this project would greatly improve user experience and operational efficiency while modernizing library services across all government agencies.

Digital Service for Citizen and Business

Digital services for businesses (G2B) and citizens (G2C) are created to improve people's quality of life and help businesses expand and become more efficient. By providing necessary public services via a single, national platform, G2C services aim to help citizens in their everyday lives. By offering integrated and interoperable systems that can provide more individualized and effective support, these services seek to go beyond basic information sharing. However, G2B services give implementation top priority based on elements like workforce importance, industry economic size, and compliance with national regulations. Furthermore, the objectives of G2B initiatives are to improve the trade environment, draw in foreign investment, and make doing business easier overall.

The services listed below are list of prioritized initiatives which can be implemented sequential order according to priority.

Table 3.30: Services in e-governance in Bangladesh[1]

No.	Digital Service Initiative	Term	Description
1	Digital Municipality Service System	Short	Digitizes local services like tax, registration, licenses for better transparency.
2	e-Customs Service Single Window	Mid	One-stop customs platform for import/export, reducing time and corruption.
3	Bangladesh Investment Single Window	Mid	Integrates investment-related approvals and registrations.
4	e-Immigration Information System	Short	Manages visa, arrival/departure, residence digitally for secure border control.
5	e-Court System	Short	Enables e-filing, virtual hearings, and case tracking to reduce backlog.
6	National Job Portal	Short	Government-managed platform linking job seekers and employers.
7	Skills for Employment Management System	Short	Connects training institutes, job seekers, and employers for job matching.
8	Environmental Information Management System	Short	Monitors environmental data for sustainable development goals.

9	Public Procurement Reform III	Short	Improves e-GP system transparency, competition, and accountability.
10	Grievance Redress System Innovation	Mid	Platform for citizen complaints and feedback on public services.
11	Bangladesh National Portal Improvement	Short	Upgrades national portal for better usability and service access.
12	Land Management System	Long	Digitizes land records and transactions to reduce disputes and corruption.
13	Agricultural Information System	Short	Provides farmers data on weather, pricing, techniques, and subsidies.
14	Integrated Disaster and Safety Management System	Mid	Integrates early warnings and response for effective disaster management.
15	Industry and Company Network Service	Short	Connects industries and regulators to ease compliance and operations.
16	Integrated Tax System and Tax Filing Portal	Short	Allows online tax registration, filing, and payment.
17	Integrated National Social Welfare System	Mid	Unifies welfare data to prevent duplication and target support effectively.
18	Government Open Data Portal	Mid	Makes government datasets publicly accessible for transparency.
19	Integrated National Healthcare Information System	Mid	Centralizes health records and services across institutions.
20	Integrated National Education Information System	Long	Manages student data, results, and education policies centrally.
21	Legislation Management System and Legal Info Portal	Mid	Provides online access to laws and supports legal drafting and updates.
22	Integrated Licensing and Certificate Management System	Short	Digital issuance and tracking of permits and licenses.
23	Resident Registration System	Mid	Central demographic database for ID and service delivery.
24	Information System of Criminal Justice Service	Long	Integrates police, court, and correction systems for efficient justice.
25	Food Information Network System	Short	Tracks food supply chain, pricing, and safety.
26	National Drug Safety Management & Disease Control System	Short	Monitors drugs and supports disease tracking and response.
27	National Science and Tech Information Portal	Short	Provides access to research and tech resources.
28	Fishery Information Mgmt System & Service Portal	Short	Supports sustainable fishing via digital licensing and data.
29	IP Management System & Patent Service Portal	Short	Online system for managing IP rights like patents and trademarks.
30	National Logistics Information System	Mid	Central logistics tracking for efficient supply chain management.
31	Intelligent Transportation System	Mid	Uses tech for safer, more efficient transport and traffic systems.
32	Livestock Information Management System	Short	Tracks livestock data for farming and veterinary services.

Source: e-government master plan for Digital Bangladesh 2018

1. Digital Municipality Service System

The Digital Municipality Service System is a short-term e-governance initiative aimed at modernizing and streamlining local government services in Bangladesh. It focuses on digitizing key services such as holding tax payment, birth and death registration, trade license issuance, and utility bill processing. By transitioning these services from manual to digital platforms, the initiative aims to reduce bureaucratic delays, minimize opportunities for corruption, and ensure greater transparency and accountability. Citizens can access these services online, saving time and reducing the need for in-person visits to government offices. This system enhances the efficiency of municipal administration and fosters trust between citizens and local authorities. Additionally, digital records help in accurate data management and policy planning. The initiative supports the government's broader vision of building a Digital Bangladesh by promoting service delivery that is faster, more reliable, and citizen-friendly.

2. e-Customs Service Single Window (Mid Term)

The e-Customs Service Single Window is a mid-term initiative designed to simplify and integrate all customs-related procedures through a unified digital platform. This one-stop service streamlines import and export processes by allowing traders to submit documents, obtain approvals, and complete clearance procedures electronically, reducing the need for multiple interactions with different agencies. The platform improves efficiency, cuts down processing time, and helps reduce corruption by minimizing manual handling. It enables real-time data sharing among relevant government departments, thereby enhancing coordination and compliance with international trade regulations. The system not only benefits traders through faster processing and cost savings but also strengthens the country's economic competitiveness by facilitating smoother cross-border trade.

Ultimately, the e-Customs Single Window supports Bangladesh's goal of creating a transparent and business-friendly environment that aligns with global digital trade standards.

3. Bangladesh Investment Single Window (Mid-term Initiative)

The Bangladesh Investment Single Window (BISW) is a mid-term e-governance initiative designed to streamline and integrate all investment-related services under a single digital platform. It facilitates faster, more transparent, and efficient processing of approvals, licenses, permits, and registrations required for investors to start and operate businesses in Bangladesh. By connecting multiple government agencies through a unified portal, BISW eliminates redundant procedures, reduces bureaucratic delays, and improves the ease of doing business. It supports both domestic and foreign investors by providing real-time tracking of applications, document submissions, and status updates, significantly reducing manual interactions and corruption. This initiative plays a vital role in enhancing investor confidence, promoting economic growth, and attracting foreign direct investment (FDI) by offering a more predictable and investor-friendly regulatory environment.

4. e-Immigration Information System (Short-term Initiative)

The e-Immigration Information System is a short-term digital service initiative aimed at modernizing and securing Bangladesh's border management through a comprehensive digital platform. It enables electronic processing and management of immigration-related functions such as visa applications, arrivals, departures, and residence permits. The system enhances the efficiency and security of immigration procedures by integrating with other national databases and surveillance systems, allowing for real-time verification and monitoring. Through automation and digitization, it reduces paperwork, minimizes processing time, and helps prevent illegal entry and overstays. This initiative is critical for ensuring secure and controlled border operations, facilitating lawful travel, and improving service delivery for travelers, expatriates, and immigration authorities.

5. e-Court System

The e-Court System is a short-term digital governance initiative aimed at transforming the traditional judicial process in Bangladesh. It enables electronic filing of legal documents (e-filing), facilitates virtual hearings through video conferencing, and allows parties to track the status of their cases online. By minimizing the need for physical presence and paperwork, this system reduces the time and cost associated with litigation, improves accessibility for citizens in remote areas, and enhances overall transparency. One of its key goals is to reduce the case backlog in courts, ensuring quicker delivery of justice and increasing public trust in the judicial system.

6. National Job Portal

The National Job Portal is another short-term initiative designed to bridge the gap between job seekers and employers. Managed by the government, this platform provides a centralized online space where individuals can search and apply for government and private sector jobs. Employers, in turn, can post vacancies and access a pool of qualified candidates. The portal supports the employment ecosystem by promoting equal opportunities, streamlining recruitment processes, and addressing unemployment challenges, especially among youth. It reflects the government's commitment to fostering inclusive economic growth through digital solutions.

7. Skills for Employment Management System

The Skills for Employment Management System is a short-term digital initiative designed to bridge the gap between job seekers, training institutes, and employers. This platform facilitates effective job matching by connecting individuals seeking employment with relevant training opportunities and potential employers looking for skilled workers. By integrating these key stakeholders, the system helps streamline the recruitment process, ensuring that job seekers acquire the necessary skills demanded by the job market. It also assists employers in finding qualified candidates more efficiently. Overall, this system aims to enhance workforce development, reduce unemployment, and support economic growth by promoting skill development and better job placement.

8. Environmental Information Management System

The Environmental Information Management System is designed to collect, monitor, and analyze environmental data to support sustainable development goals (SDGs). By digitizing environmental information such as air and water quality, pollution levels, forest coverage, and biodiversity, the system provides policymakers, researchers, and the public with accurate and timely data. This enables informed decision-making aimed at protecting natural resources, mitigating climate change impacts, and promoting environmental sustainability. The system also facilitates reporting and compliance with national and international environmental standards. By integrating various environmental indicators into one platform, it helps track progress towards sustainability targets, identify emerging environmental issues, and improve resource management efficiency.

Overall, this digital initiative enhances transparency, supports evidence-based policies, and strengthens the government's ability to promote a healthier and more sustainable environment for current and future generations.

9. Public Procurement Reform III

Public Procurement Reform III focuses on enhancing the electronic Government Procurement (e-GP) system to increase transparency, competition, and accountability in public procurement processes. By upgrading and expanding e-GP functionalities, this initiative reduces corruption risks, streamlines procurement procedures, and ensures fair access for suppliers and contractors. It promotes open bidding and better contract management, helping government agencies achieve cost savings and improve service delivery. The reform emphasizes capacity building, process standardization, and real-time monitoring of procurement activities. Through improved digital tools and oversight mechanisms, Public Procurement Reform III strengthens public trust in procurement systems and aligns with good governance principles. Ultimately, this initiative aims to foster a more efficient, transparent, and competitive procurement environment, supporting the effective use of public resources and contributing to economic development.

10. Grievance Redress System Innovation:

This initiative provides a centralized digital platform where citizens can lodge complaints and provide feedback regarding public services. It enhances transparency, ensures government accountability, and enables faster resolution of issues by routing complaints to the relevant departments. The system empowers citizens by giving them a voice and allows government agencies to identify service gaps, helping to improve overall service delivery. Its mid-term implementation ensures deeper integration with various sectors and continuous improvement based on user input.

11. Bangladesh National Portal Improvement:

The national portal of Bangladesh acts as a gateway to government information and services. The improvement initiative focuses on making the portal more user-friendly, accessible, and inclusive. Enhancements include better navigation, multilingual support, responsive design for mobile use, and easier access to e-services. This short-term initiative ensures that citizens, especially those in rural areas, can efficiently find information and interact with government services online, contributing to increased digital inclusivity.

12. Land Management System:

This long-term digital transformation aims to modernize and secure land records across the country. It digitizes ownership records, land maps, and transaction processes to reduce corruption, eliminate fraudulent claims, and resolve disputes efficiently. Citizens benefit from greater transparency, easier access to land-related services, and legal protection of ownership. The system also supports government planning and revenue collection by maintaining accurate land databases.

13. Agricultural Information System:

Designed to support farmers, this system delivers vital agricultural information through digital means. It provides timely updates on weather forecasts, crop prices, cultivation techniques, pest control, and available government subsidies. As a short-term initiative, it uses mobile apps and SMS services to reach even remote farmers, empowering them to make informed decisions, improve productivity, and increase income while enhancing food security in Bangladesh.

14. Integrated Disaster and Safety Management System

The Integrated Disaster and Safety Management System is a vital e-governance initiative aimed at enhancing national disaster preparedness and emergency response mechanisms. This system integrates various early warning sources, real-time data analytics, and response coordination tools into a single digital platform. It enables proactive dissemination of disaster alerts—such as cyclones, floods, and earthquakes—to vulnerable communities, local authorities, and emergency services. The platform ensures swift mobilization of resources, coordination among government agencies, and real-time situational updates, which collectively enhance resilience and reduce loss of life and property. By streamlining the management of disaster-related information, this system supports data-driven decision-making, promotes public safety, and strengthens institutional capacity in both urban and rural areas of Bangladesh.

15. Industry and Company Network Service

The Industry and Company Network Service is a digital platform designed to connect industries, regulatory authorities, and service providers to improve the ease of doing business in Bangladesh. Through this system, companies can manage regulatory compliance, licensing, and other legal obligations efficiently by

interacting directly with government regulators in a digital environment. It simplifies processes such as business registration, tax compliance, and industry-specific certifications. The platform also allows for centralized access to industrial data and facilitates better policy planning and regulatory oversight. By reducing bureaucratic friction and improving transparency, the initiative fosters a more conducive environment for industrial growth and investment, supporting Bangladesh's broader economic development goals.

16. Integrated Tax System and Tax Filing Portal

The Integrated Tax System and Tax Filing Portal is a comprehensive digital solution for streamlining Bangladesh's tax administration. It enables individuals and businesses to complete the entire tax process online—from registration and return submission to assessment and payment—thereby reducing manual paperwork and physical visits to tax offices. The portal supports real-time data validation, user authentication, and automated calculation of dues, which minimizes errors and increases compliance. It also provides taxpayers with access to their digital tax records, status tracking, and helpdesk services. This system significantly increases revenue transparency, curbs tax evasion, and improves the overall efficiency and trust in the country's taxation system.

17. Integrated National Social Welfare System

The Integrated National Social Welfare System is designed to unify data from various government welfare schemes under a centralized digital platform. This integration helps in accurately identifying beneficiaries, avoiding duplication of benefits, and ensuring that support reaches the most vulnerable segments of society. The system combines databases from ministries handling pensions, allowances for the elderly, persons with disabilities, widows, and low-income families. By using biometric verification, national ID linkage, and geographic targeting, the system enhances transparency and accountability in welfare distribution. It also allows for better planning, monitoring, and reporting by policy makers and facilitates more responsive and inclusive social protection strategies across Bangladesh.

18. Government Open Data Portal

The Government Open Data Portal is a significant step toward fostering transparency, accountability, and innovation in public service delivery in Bangladesh. This platform makes government datasets accessible to the public, researchers, and developers by offering a centralized online repository of statistical and operational data from various ministries and departments. By enabling free access to this information, the portal promotes data-driven decision-making, supports academic research, and encourages the development of new digital services and applications. It also helps monitor government performance and policies, empowering citizens to hold institutions accountable.

19. Integrated National Healthcare Information System

The Integrated National Healthcare Information System is designed to centralize and digitalize health-related data and services across all public and private healthcare institutions in Bangladesh. This system ensures a unified health record for each citizen, allowing seamless coordination among hospitals, clinics, and healthcare professionals. It improves service efficiency, patient care quality, and health policy formulation by providing real-time data access. The system also supports telemedicine, electronic prescriptions, and health monitoring, significantly reducing paperwork and improving health outcomes through timely interventions and data analytics.

20. Integrated National Education Information System

The Integrated National Education Information System aims to manage and monitor the entire education ecosystem in Bangladesh through a centralized digital platform. It stores and tracks data related to students, teachers, institutions, examination results, and curriculum implementation. The system allows policymakers to analyze trends, identify gaps, and design effective education strategies. It also enhances transparency by allowing easy access to academic records for students and guardians. By integrating education management across regions and levels, it ensures consistency in policy enforcement and improves overall governance in the education sector.

21. Legislation Management System and Legal Info Portal

The Legislation Management System and Legal Information Portal provide a comprehensive digital platform for drafting, updating, and accessing laws and regulations in Bangladesh. It enables government officials, legal professionals, and citizens to find laws, amendments, and legal frameworks easily, fostering transparency and rule of law. The system facilitates the digital management of legal texts, supporting coordination among legislative bodies and minimizing human error or duplication in legal processes. By ensuring timely updates and public accessibility, it enhances legal awareness and strengthens democratic governance.

22. Integrated Licensing and Certificate Management System

The Integrated Licensing and Certificate Management System simplifies and digitizes the entire lifecycle of permits, licenses, and certificates issued by government authorities. This system enables online application, verification, approval, issuance, and renewal of various regulatory documents required by citizens and businesses. It reduces bureaucratic delays, minimizes corruption, and enhances service delivery efficiency. By integrating multiple agencies into a unified platform, it ensures transparency, consistency, and real-time tracking of application status, greatly improving the user experience and promoting a business-friendly environment in Bangladesh.

23. Resident Registration System

The Resident Registration System is a foundational component of e-governance in Bangladesh, designed to establish a central demographic database that supports national identity verification and public service delivery. This system registers individuals with unique identification numbers linked to their biometric and personal data, such as name, address, date of birth, and family information. Integrated with other government platforms, it facilitates seamless access to services like education, healthcare, social security, and voting rights. By maintaining a centralized and regularly updated population database, the system enhances transparency, reduces duplication, and ensures targeted service delivery to the right individuals. As a mid-term priority, it also supports planning, disaster response, and policy-making by offering accurate demographic statistics.

24. Information System of Criminal Justice Service

The Information System of Criminal Justice Service is a long-term strategic initiative aimed at integrating the various arms of the justice system—police, judiciary, prosecution, and correctional institutions—under one digital platform. It allows for efficient case tracking, real-time information sharing, and standardized procedures throughout the criminal justice chain. This reduces delays in case processing, enhances transparency, minimizes errors, and prevents data manipulation. The system also helps streamline arrest records, evidence management, trial schedules, and correctional data, thereby ensuring better coordination and timely justice. It is a crucial step toward modernizing the legal system and reinforcing public trust in law enforcement and judiciary mechanisms.

25. Food Information Network System

The Food Information Network System is a short-term e-governance initiative that ensures transparency and efficiency across Bangladesh's food supply chain. It digitally monitors food production, distribution, storage, pricing, and safety parameters in real-time. The system connects stakeholders including farmers, suppliers, distributors, and regulatory bodies, enabling timely interventions in case of price volatility or safety breaches. It supports the government in regulating food quality standards, detecting adulteration, and enforcing compliance. Through public dashboards and mobile alerts, consumers can access up-to-date information on food availability and prices, empowering them to make informed choices. This initiative plays a key role in ensuring food security and protecting public health.

26. National Drug Safety Management & Disease Control System

The National Drug Safety Management & Disease Control System is designed to safeguard public health by monitoring the lifecycle of pharmaceutical products and enhancing disease surveillance. It tracks the production, import, distribution, and sale of drugs to prevent counterfeit and substandard medicines. Simultaneously, it integrates data from healthcare providers to monitor disease trends, outbreaks, and treatment effectiveness. The system supports real-time alerts and data-driven decision-making for health officials, enabling rapid response to epidemics or drug-related issues. By ensuring accountability in the drug supply chain and enabling timely disease control, this initiative strengthens the country's healthcare infrastructure and builds public trust in medical services.

27. National Science and Tech Information Portal

The National Science and Technology Information Portal is a comprehensive digital platform aimed at centralizing access to scientific research, innovation data, and technological resources in Bangladesh. It offers researchers, students, professionals, and policymakers a curated database of journals, patents, ongoing research projects, and academic publications. The portal fosters collaboration among educational institutions, research centers, and industries by providing a common knowledge-sharing platform. It also highlights government-funded research and emerging technologies, helping bridge the gap between science and society. As a short-term initiative, the portal supports evidence-based policy-making, encourages innovation, and contributes to the national goal of building a knowledge-based economy.

28. Fishery Information Management System & Service Portal

The Fishery Information Management System and Service Portal is a digital initiative aimed at promoting sustainable fishing practices in Bangladesh. By offering online services such as digital fishing licenses, real-time data collection on fish stock, and information on fishing zones and seasons, this system empowers both fishers and government authorities to make informed decisions. It ensures better compliance with regulations, improves monitoring of fish resources, and helps in preventing overfishing. This digital solution also integrates data analytics for policy formulation and resource management, contributing to the long-term sustainability of the fisheries sector an essential component of the country's economy and food security.

29. IP Management System & Patent Service Portal

The IP Management System and Patent Service Portal provides an online platform for managing intellectual property rights, including patents, trademarks, copyrights, and designs. It streamlines the entire lifecycle of IP rights—from application and examination to grant and renewal eliminating the need for physical visits and reducing bureaucratic delays. By digitizing the process, this portal enhances transparency, protects innovation, and promotes awareness of intellectual property laws. It also supports entrepreneurs, researchers, and inventors by offering searchable databases, status tracking, and automated notifications. This system plays a crucial role in fostering a culture of innovation and supporting the growth of knowledge-based industries.

30. National Logistics Information System

The National Logistics Information System is a centralized digital platform designed to manage and monitor the movement of goods across Bangladesh efficiently. It offers end-to-end visibility of the logistics network by integrating data from transport agencies, warehouses, ports, and customs. This system supports real-time tracking, route optimization, and bottleneck identification to improve supply chain efficiency. It helps the government and private sector plan better, reduce transit times, and minimize logistics costs. Additionally, it strengthens trade facilitation and export competitiveness by ensuring transparency, accountability, and timely delivery in logistics services—a critical factor for economic development and investment.

31. Intelligent Transportation System

The Intelligent Transportation System (ITS) utilizes modern technologies such as sensors, GPS, traffic cameras, and data analytics to improve the safety, efficiency, and reliability of Bangladesh's transportation networks. ITS applications include real-time traffic monitoring, automated traffic signal control, digital toll collection, and accident detection. These technologies help manage congestion, reduce travel time, and enhance commuter experience. The system also supports public transport scheduling, emergency response coordination, and urban traffic planning. By transforming traditional traffic systems into smart, data-driven solutions, ITS contributes significantly to safer roads, lower emissions, and more sustainable urban development.

32. Livestock Information Management System

The Livestock Information Management System is a digital platform that facilitates the comprehensive tracking and management of livestock data across Bangladesh. It maintains records on livestock populations, health status, vaccination schedules, and breeding information. This system supports veterinarians, farmers, and policymakers by providing timely alerts, disease outbreak tracking, and guidance on animal health practices. It also aids in the planning and execution of livestock development programs, improves traceability in meat and dairy supply chains, and boosts productivity through informed decision-making. The system ultimately strengthens food security, rural livelihoods, and the national agricultural economy by ensuring efficient livestock management.

Implementation Plan[1]
Roadmap

The roadmap is the step-by-step plan that guides the implementation of e-governance from vision to reality. The roadmap should be broken down into short-term (1–2 years), medium-term (3–5 years), and long-term (5+ years) milestones in the context of Bangladesh. Creating interoperability standards for government databases, digitizing high-demand services like land records and tax payments, and extending broadband coverage to underserved areas are a few examples of short-term initiatives. The integration of various service portals into a single, cohesive platform, the expansion of cyber security infrastructure, and the implementation of thorough data protection regulations could be the main objectives in the medium term. Long-term objectives could involve deploying AI-based decision-support tools, blockchain for secure document storage, and smart city governance systems. Each phase should have clearly defined deliverables, timelines, budgets, and responsible agencies.

To swiftly show benefits and gain the public's trust, the roadmap must be practical and prioritize high-impact projects first. To avoid duplication of effort, coordination between ministries, local governments, and

private partners will be essential. To ensure transparency, regular progress reviews ideally quarterly should be carried out and reported to the public. The roadmap needs to be flexible in order to take into account evolving needs, citizen input, and technological advancements. To prevent project delays, risk mitigation techniques like contingency funding and backup infrastructure are also crucial. Bangladesh can guarantee that the implementation of e-governance stays targeted, quantifiable, and in line with national development objectives by adhering to a well-organized roadmap.

e-Government Framework

The structural guideline that establishes how government organizations cooperate, exchange information, and provide services online is known as the e-Government Framework. This framework ought to be created in Bangladesh with interoperability, security, and citizen-centricity in mind. A three-tier model might be used: a sectoral layer for ministry-specific platforms (like health, education, and finance); a national layer for policy, standards, and core infrastructure (like national data centers, cloud services, and identity verification systems); and a service delivery layer for direct citizen interactions through portals, apps, and physical service centers. Agencies must adhere to common protocols for data formats, cyber security, and authentication; standardization is crucial.

To avoid citizens having to give the same information to various departments over and over again, the framework should require the use of a single digital identity for all services. The architecture must incorporate security features like encryption, multi-factor authentication, and intrusion detection systems. Tools for monitoring performance, service utilization, and standard compliance should also be part of the framework. In order for the system to accommodate growing numbers of users and services over time, scalability is crucial. Additionally, plans for data backups and disaster recovery will guarantee business continuity in the event of cyberattacks or system failures. Bangladesh can improve public trust in digital governance, cut down on duplication, and expedite service delivery by putting in place a strong and transparent e-Government Framework.

Digital Services

As envisaged in the "To-be Model," the actual rollout of new and enhanced online government services is referred to as "Digital Services" during the Implementation Plan phase. Through a variety of platforms, including web portals, mobile apps, call centers, kiosks, and Union Digital Centers, the goal is to guarantee universal, practical, and secure access to crucial public services. Services with the greatest impact, like national ID services, medical appointments, school enrollment, land and property registration, social welfare benefits, and tax payments, should be prioritized. Since the majority of Bangladeshis use smartphones to access the internet, mobile optimization is essential. Transactions can be made smooth by integrating with mobile payment systems like bKash, Nagad, and Rocket.

Services must incorporate accessibility features for people with disabilities and support the Bangla language in order to improve inclusivity. To enable citizens to report problems or make suggestions for improvements, each service should be connected to a central grievance and feedback redressed system. Every service must incorporate cybersecurity measures like encrypted communications, secure payment gateways, and two-factor authentication. Real-time performance tracking, bottleneck identification, and prompt resolutions can all be facilitated by a dedicated service monitoring dashboard. Awareness campaigns that inform the public about the services that are available and how to use them should be started through TV, social media, and local events in order to boost adoption. By utilizing current technological platforms, collaborating with the private sector can aid in the faster scaling of services.

In order to save time, cut expenses, and boost public confidence in government systems, the ultimate goal is to establish a seamless citizen experience where public services are accessible whenever and wherever citizens need them.

Legal Framework

The Legal Framework's implementation phase entails passing, revising, and upholding the legislation that promotes digital governance. This guarantees the legal recognition, security, and accountability of all e-governance operations. Enacting a thorough Data Protection and Privacy Law that outlines precisely how citizen data is gathered, saved, shared, and erased and imposes severe penalties for infractions is a top priority. The framework must also give electronic contracts, e-signatures, and digital identities the same legal standing as paper documents. To combat advanced threats like ransomware, phishing, and deepfake scams, cybercrime laws must be reinforced. To handle cases effectively, specialized cybercrime courts and qualified digital forensic specialists ought to be established.

In order to ensure that Bangladesh's digital systems can function in the global ecosystem while preserving sovereignty, the legal system must also address cross-border data sharing by negotiating agreements with other nations. Clear interagency data exchange protocols should be established by law to prevent abuse and

facilitate the effective provision of public services. To ensure that citizens are shielded from fraud in online government services, consumer protection laws ought to be extended to include digital transactions. To enable laws to adjust to new technologies like blockchain, artificial intelligence, and the Internet of Things, a continuous legal review process—possibly once a year—should be required. Campaigns for public awareness are necessary to help people understand their rights and responsibilities online and to boost system trust. E-governance runs the risk of becoming dispersed, unsafe, or ineffectual in the absence of a solid, current legal framework.

Governance for e-Government

During the implementation phase, governance for e-Government refers to the daily administration, coordination, and enhancement of digital government systems. All digital projects should be supervised by a specific National e-Government Authority to make sure they adhere to performance goals, deadlines, and standards. Key performance indicators (KPIs) like service uptime, user satisfaction scores, and security incident responses must be tracked by this organization. Real-time analytics from service usage data should be used to support evidence-based decision-making. To guarantee consistent service quality throughout the nation, there must be strong vertical coordination between the national, divisional, district, and Union Parishad levels. Ministries and agencies can be encouraged to meet goals by using a performance-based funding model. Transparency must also be promoted by governance structures through frequent progress reports and public consultations.

In order to guarantee that user needs have a direct impact on service enhancements, citizen engagement should be formalized through digital feedback portals, social media platforms, and community gatherings. Government employees must receive continual training and capacity building in subjects like cyber security, digital ethics, and emerging technologies. Working together with universities, non-profits, and private tech firms can bring creativity and specialized knowledge to the governance process. Additionally, the governance model should be naturally flexible so that it can react swiftly to emerging opportunities or challenges without being held up by red tape. Governance for e-Government can transform Bangladesh's digital transformation into a sustainable, citizen-driven reality by guaranteeing strong leadership, accountability, and public participation.

IV.   Digital Technologies For Transparent And Efficient Governance

The use of digital technology in the provision of government service is making service more transparent, accountable and efficient in Bangladesh. Digital tools make it easier for citizens to access services and information, diminishing the potential for corruption and red tape. Online systems generate a trail of transaction, enhancing traceability and attention to responsibilities the officials must fulfill. E-governance project-driven process re-engineering ensures quick flow of work with minimum manual touch. Such technologies provide real-time tracking and feedback, which help the government departments to be more adaptable, citizen oriented. In general, the digitization pushes for a culture of open government that aims to empower citizens while efficient resources.

Public Administration

The way public administration is performed in Bangladesh has improved due to using digital technologies which are more transparent, accountable and cost effective. One of the outcomes of embedding ICT in governance is that government has automated several services including land administration, procurement and citizen's service delivery. These efforts minimize corruption, eliminate bureaucratic logjams and allow for decisions based on data. e) Digital land records and national e-service Portal, e-GP for service access by citizens followed by accountability, efficacy are enabled. This digitalization is a step towards building public trust and facilitating the other aspects of "Digital Bangladesh".

Digital land record and e-Mutation system

Digitalization of land records and introducing e-mutation systems transformed the land administration in Bangladesh to a more transparent citizen centric process. In the past, land administration was suffering from manual recording, frequent mistakes and room for corruption. But now with Land Information Management System (LIMS) and e-Mutation, people can get to know their land records online and do mutation of their plot digitally. This reduces human factor in updating information about land owners on acquisition of the latter by inheritance, purchase or donation.

These digital systems can facilitate the verification of land ownership, reduce disputes over land and establish a centralized, tamper-proof database of land for local land offices to manage more efficiently. An accountable digital platform, the e-Mutation system follows up on every application with an ID which is made accessible to the applying party and is good enough for real-time monitoring by SMS or email. And that the association of GIS mapping and scanned land files will enable faster verification and ensure security. The digital

system has increased the reliability of data, delivering times of services and minimizing petty corruption thus proving that technology brings about good governance in the public sector.

National e-Service Portal (www. nationalportal. gov.bd)

The National e-Service Portal (www. nationalportal. gov.bd) is a single window system for locating all of its thousands of government services and information from ministries, departments and district sub-district offices. Implemented by the a2i Program, this portal is an important element of Bangladesh's digital transformation agenda that seeks to drive service delivery more transparently, accountably and effectively. People can access more than 4,500 service related entries including application for trade licenses, birth and death registrations, forms download, results checking and agriculture or health advice.

The gateway also enhances transparency by supporting less personal contact and tracking of services. Each agencies performance can be tracked by public feedback and delivery information which promotes accountability. The portal also increases efficiency by reducing travel, time, and paperwork that rural and other marginalized citizens previously had experienced in trying to get government services.

One interesting thing is the portal's linkage with mobile apps and union digital centers (UDCs), which even digitally less-literate people will be able to utilize. The portal mitigates duplication, promotes inter-agency cooperation and facilitates thoughtful policy-making driven by real time data use trends with automation and interfaces among the departments. In general, it demonstrates how ICT can narrow the distance between citizens and state thereby promoting more inclusive and responsive governance.

Electronic Government Procurement (e-GP)/Automated Tendering System (ATS)

Introduction The Electronic Government Procurement (e-GP) system is an ambitious digital solution for promoting transparency, fairness and efficiency in public procurement in Bangladesh. Developed by the CPTU of Ministry of Planning, e-GP system replaces manual process with an integrated automated web-based solution to cover entire procurement lifecycle from requisitioning till contracting. All tender information is available online which provides a level playing field for qualified bidders and mitigates the potential of collusion or nepotism.

This system promotes transparency by posting E-Advertisements, bid tabulations and contract awards to the public. Live monitoring means that if anomalies turn up or activities falls outside of the norm, it gets flagged for further review then and there. This ensures the system logs and monitors all activity, and that individual users of each system are recorded in the audit trail.

Efficiency has also greatly increased: The time consumed by procurement processing has been reduced, costs have diminished as a result of electronic transaction (ET) and officials can manage more than one tender at the same time. And, the use of e-GP system enables enhanced utilization and planning of budget with tools for analysis and performance measuring. Its emphasis is on value for money and honesty in public spending, through the encouragement of competitive tendering and common procurement methods. Bangladesh's e-GP is being hailed as a best practice in transparent procurement among developing countries by the World Bank and other development partners.

Law and Justice

Digitalization in the Law and Justice sector in Bangladesh The Law and justice sector of the country is increasingly relying on information technology to bring in transparency, accountability, efficiency service delivery. The e-court and case management system, virtual hearing, digital case tracking or online police verification and GD filing have made judicial process faster while minimizing delays in justice to citizens. These have contributed in mitigating corruption, systematizing procedural deficiencies and enhancing access to inclusive legal service which is demand for a more responsive justice delivery system in Bangladesh.

E-Court and Case Management

The e-Court and Case Management System in Bangladesh is a significant administrative reform initiative aiming at simplifying case procedure as well as ensuring more transparent way of taking care of the administration thereof, with support from technology. By digitization of case files, schedule`s automation and paperless concept in the judicial procedures we minimize delays which sometimes are attached to manual documents and waste of time. Judges and court experts can check the statuses of existing cases, follow up on case progress, and issue orders online Onsite real-time access of Judges here effectuates reduction in backlogs as well as knowledgeable assignment and management of workflow. This has enhanced the transparency of court process since their status and orders are available online in a digital form. It also enhances transparency and accountability — with every action taken in a case being digitally recorded, there's less wiggle room for sneaky delays or other procedural shenanigans. The implementation of the electronic cause list and calendar management tool facilitates litigants, lawyers and court official getting accurate information so as to minimize the possibility of interference,

manipulation or malpractices. This digital backbone not only makes courts work better, but also helps in enhancing trust of the people and uptime delivery of fair and speedy justice. With the implementation of this technology in district courts, government has moved further to achieve transformation by making justice delivery citizen-friendly and citizen-centric.

Remote Hearings and Electronic Case Management

Bangladesh's Dayeen Forum has been fighting for improving access to justice, an endeavor that has been freshly reinvigorated, especially amid COVID-19 thanks to virtual hearings and digital case tracking in the judiciary. The courts, by the use of video-conferencing and other means, may now conduct their hearings from a distance without requiring that the parties, lawyers or witnesses be present. This has saved many poor villagers in remote areas precious time and expense (on travel). Furthermore, virtual courtrooms also serve to reduce delays by keeping the work of courts going despite the disruption and securing uninterrupted access to justice. In addition to virtual hearings, online case tracking systems give litigants and their lawyers the ability to track the status of their cases online. These are used to send updates regarding hearing dates, status of the order, judges assigned and more which help in increasing transparency in the legal process. Digital case tracking also ensures accountability, since physical evidence is most susceptible to being tampered with or lost. These applications have intuitive interfaces and are linked to national databases like NID (null) and judicial records in order to help prevent any risk of fraud. Therefor, the legal process as a whole become much more predictable and manipulation becomes less easy. Taken together, virtual hearings and e-case management make the justice system in Bangladesh more reliable, inclusive and accessible.

Online Police Clearance and GD Filing

"This is a game changer in law and order service in Bangladesh," said one of the most senior police officers. In the past, queuing for a police clearance is manual and is therefore subject to corruption or under the table fees. A new online application system now enables citizens to apply on the basis of personal information along with payment of a fee. The mechanism guarantees transparency as it will produce a digital receipt and tracking number for each application that the applicant can use to track the process of his/her request. Through the online GD filing, citizens can also report lost goods other than harassment or threats without going to a police station. This adds accountability into the mix by recording each GD entry, associated with timestamps, officer IDs and any supporting documents or images. It is the duty of police officers to act expeditiously and to keep the complainant informed. Such services discourage human interface and thus reduce any chances of bribes or malpractice. They also help in making the process efficient by automating documentation, minimizing paper work and accelerating verification. Integration with the National ID system and other government databases add to the credibility of these services. On the whole, digitisation of police clearance and GD filing contributes to increased public trust in law enforcement through provides open, prompt delivery of basic policing services.

Finance and Revenue

Due to digital technologies that are often associated with a transparent, accountable and efficient dexterity of financial and revenue sector in Bangladesh. Online tax filing, digital budget reporting and automatic customs transactions have dramatically lowered the need for people to interact with bureaucrats, reduced graft and made public information on finances more readily available. By helping residents, businesses and institutions to better interact with government services, these tools also facilitate real-time data sharing and monitoring that can facilitate the management of revenue streams and fiscal performance.

Online Tax Filing (e-TIN, VAT Online System)

The Electronic Tax Identification Number (e-TIN) and VAT Online System by National Board of Revenue (NBR) has been a significant move to enhance transparency and integrity in the taxation domain of Bangladesh. With the e-TIN system in place, the process of registration and getting access to the tax profile is completely digitalized with taxpayers no longer required to visit an office and wait for state machinery. The VAT Online System enables businesses to file their VAT returns and make payments and also follow up on their submissions electronically. These systems have simplified interface that stands for data accuracy and traceability, thus leading tax evasion and corruption to property. What's more, the taxpayer will then have automatic reminders and be able to access digital records for a more transparent and secure process. Such systems have also improved citizen confidence by limiting the tax officer discretion and bringing uniformity in businesses operation. In general, they have enhanced revenue mobilization, broadened the tax base and supported a more transparent and effective system of taxation.

Digital National Budget Documents

The Bangladesh Government has digitalized the documentation process of national budget making it fully accessible in real time to public on its official websites. The budget proposals, allocations, expenditure and explanation notes are now available to the public including citizen's researchers etc, development partners and civil society through web portals of the Ministry of Finance. This digital accessibility gives way to transparency, enabling the public examination of how government monies are being spent. It also increases accountability by ensuring that citizens can track whether funds are allocated and spent as planned. Further, the digital budget system promotes effectiveness by accelerating communication of documents and decision-supporting information among government bodies. For the general public, complex budget data is made more understandable through a variety of interactive tools and infographics. This transparency in financial information supports citizens' engagement, enhances democratic governance and leads to a participatory and inclusive budget process.

Automated System for the Customs, e-Customs (ASYCUDA World)

Modernizing the Customs System Bangladesh has modernized customs through installing at Chittagong and Dhaka ports UNCTAD's Automated System for Customs Data (ASYCUDA World). The system was developed in-house by the Bangladesh Customs authority and facilitates electronic submission of import-export declarations, processing, assessment and cargo tracking and risk management. Going from manual papers to an online medium, it has made life easy in terms of how long it takes for clearing, the cost and most importantly human interference." Not only does this have the effect of mechanisms for increased efficiency and reduced corruption, but by taking the opportunity to automate it, the government has taken a strong approach that China simply has not been able to. This system also provides transparency in real-time data availability to various concerned parties such as traders, freight forwarders and banks. It also improves transparency since all transaction are recorded and can be traced. This ASYCUDA World has not only enhanced trade facilitation but also revenue collection through the avoidance of under\-invoicing and false declarations. The customs in the digital era will make processes simpler for both importers and exporters, as well as help to integrate Bangladesh into the global supply chain.

Decentralization and Local Development

The role of Local Government and Rural Development (LGRD) sector in Bangladesh is significant for delivering basic services to the citizens, infrastructure facilities to the people and socio-economic development at grass root level. The incorporation of digital technology in this area has brought about a tremendous amount of transparency, accountability and service delivery efficiency. For the first time, with e-governance measures local bodies can function in a more efficient manner and also keep a check on their projects online. Technology has cut through bureaucratic red-tape, stifled corruption and given voice to the ordinary citizen. These partnerships are very much congruent with the government vision of Digital Bangladesh which aims to improve faster, transparent and people-friendly governance process through ICT in rural communities.

Digital Municipality Services

Digital Municipal Services (DMS) has revolutionized urban local governance system in Bangladesh by launching citizen service online platforms. Municipal services like trade license, holding tax assessment, birth and death certificating issuing transport fee collection are now available in digital form for public access through their municipal websites. This digitization led to faster and less opaque service delivery, decreased reliance on manual processing, thus minimizing the chances of corruption and delays. Residents can access services from home, without visiting town hall, so it saves money. On top of that there is much better accountability from digital records as they can be properly logged and audited. Further, DMS platforms combine GIS-based maps and digital property databases, thus facilitating precise tax recovery and efficient urban planning. Local governments can monitor actual collections as they happen, for improved fiscal transparency and resource management. It promotes accountability through updating service status as well as feedback opportunities where residents can report on complaints. DMS also aids effective data management, evidence-based decision-making DMS eliminates manual and physical interactions in the process as well as paperwork. The project enhances role of local government institutions in urban development and is consistent with the overall visions of Digital Bangladesh. Finally, Digital Municipality Services have improved the trust in government from the general population and facilitated creation of revenues for further expansion in urban governance.

Union Digital Centers (UDCs)

Union Digital Centers (UDCs) serve as rural "one stop points" set up under the a2i program to provide digital access of Government and non-government services to the citizens at their doorsteps. It's reunited at Union Parishads where they connect with over 200 governments to citizen services such as e-Birth registration, land records application, passport application filing, mobile banking and agriculture advisory etc. By reducing the

digital divide, UDCs brought new levels of transparency and accountability to rural service delivery. Digital payments also narrow the space for bribery as online history of works can be tracked. They have also generated employment opportunities and incomes for rural entrepreneurs (Uddoktas) leading to local economic development. Rural citizens can now: use video conferencing and mobile apps for one-on-one conversations with government representatives, minimizing reliance on middlemen. The service centers support e-commerce as well, providing farmers and small entrepreneurs a platform to sell their products over the web. In addition, UDCs serve as information centers regarding education, health and social welfare programs to keep the rural communities informed on governmental schemes. The efficiency of the system lies in having multiple services provided at a single point, minimizing the time and cost citizens have to spend travelling. UDCs have improved accountability and reduced the level of service delivery corruption by automating operations and keeping transaction records. They have become invaluable hubs of participatory development that bring digital governance to the rural communities it serves.

LGED Project Monitoring Systems

The LGED has introduced digital project monitoring systems designed to enhance the effectiveness, transparency and accountability of infrastructure development schemes throughout Bangladesh. Budgets, schedules, physical progress, and other financial information is updated in real time via web-based platforms and mobile apps. GPS tracking equipment and drone surveys make sure that operations on the ground are in line with project designs, which lessens both the scene for mission funds misuse and project delays. The online system makes it possible for higher-ups to monitor the progress from a distance, spot any abnormalities and rectify the same in a time-bound manner. Project information can be found online on the internet by interested parties, such as citizens and development partners, in order to spread openness and public monitoring. Automation tools also cut down on paperwork, and human error, to produce more accurate financial and technical documents as well. Good governance practices are reinforced by digital tracking, which ensure that contractors and officers are held responsible at every stage of a project. The system also supports decision-making based on evidence by processing project performance data, which can improve the allocation of resources and planning for the future. Moreover, LGED's e-tendering system linked with e-GP (Electronic Government Procurement) has minimized corruption in the tender process through open and competitive bidding. These efforts have led to increased project implementation, better quality and cost savings. In general, the digital monitoring procedures of LGED have improved accountability, reduced corruption and ensured (rural) infrastructure quality thereby promoting sustainable development and effective public service delivery".

Education

Transparency, Accountability and Efficiency in Education in Bangladesh: Role of Digital Technology (credit: preschoolforall.org) Transparency, Accountability and Efficiency in the Education System through Provision of Digital Technology In this last section we will also try to briefly explore two other areas ie accountability and efficiency with respect to governance. By building in online platforms, students and teachers no longer have to wait for this cumbersome bureaucracy to be overcome before they can access information, resources or services. E-government services have minimized paperwork and corruption by automating formalities (admission, exam registration and result-publishing). Online monitoring makes it easier for them to monitor teacher tracks, student progress and resource allocation for better accountability. Digital education tools also have the potential to narrow the urban-rural education gap by offering quality learning resources to students in remote areas. Another important point is that all money transactions such as tuition payments or scholarships are internet-based, thus diminishing the possibility of fraud. The reforms will make education services more efficient, student-centric and inclusive in line with the country's aspiration for Digital Bangladesh. Introducing greater transparency in decision-making and enhanced access to learning are other ways that digital education initiatives can help to improve the governance of the sector as a whole.

Learning Management Systems (LMS)

Learning Management Systems (LMS) has revolutionized the education system in Bangladesh by restructuring the transparency, accountability and effectiveness of teaching learning process. On LMS system teachers make available material covered in lectures, assignments and marks for both students and parent's perusal. Such clarity diminishes the potential for favoritism or unfair trading, because everything is available to all students. LMS also support digital records of student attendance, bringing down the control over the data on cluttering by students. Administrators, at the level of education bureau, can track when teachers are teaching, from teaching time to course completion rates and school performance as a whole. LMS has reduced the need for traditional paperwork and physical records because management of education has become easier to perform, faster and at a low cost. Besides, LMS brings chance to students from geographically isolated and economically disadvantaged regions or country in rural urban locales to have access to the same types of high quality courses

available to urban counterparts. It also facilitates recorded lectures and interactive forums promoting participation, and flexibility in learning to accommodate the diverse paces of learning students have. Using complex analysis and feedback tools, schools can measure how well teaching methods work and make adjustments as necessary. The systems are especially helpful during emergencies, such as the COVID-19 pandemic, to keep education courses moving. Therefore, LMS has become an important instrument toward creating a more efficient and transparent education system in Bangladesh.

Virtual Reality-Classrooms and Digital Multimedia Content

Digital classrooms and multimedia content are playing an essential role in transforming the education system of Bangladesh to be more interactive, transparent, accessible, and modern. Multimedia classrooms with projectors, smart boards and internet provide teachers the ability to teach through visuals and audios which make learning more interesting and understandable. This eliminates the burden of memorizing and enables student to understand difficult concepts perfectly. Government developed programs like the Multimedia Classroom Project also mean that students in remote locales get outfitted with modern facilities, bridging the urban-rural education divide. Teachers upload lesson plans and instructional videos to digital platforms, which education authorities can use to monitor teaching quality and assure adherence to curricular standards. This open book offers educators the accountability. The students have access to e-books, video tutorials and virtual experiments in addition to the traditional textbooks that are more conducive for creativity. Archived material can be repurposed, which conserves time and resources and leads to better consistency in quality. What's more: online modules for teacher training will help build teaching capacity across the country, and digital classrooms means special education support can be brought into rural areas. These programs are more efficient by reducing reliance on printed materials and providing easily updated content. In addition, there are remote classes and the online workshops make education more inclusive especially for students in disadvantaged regions. Digital classrooms also play a key role in enhancing governance and service delivery of education by enabling interactive, trackable and ubiquitous access to quality content.

Web-Based Enrolment and Examination Registration.

The internet based admission and examination registration systems have been largely responsible for increasing efficiency, transparency and accountability in the administrative procedures of Bangladesh education. Historically, students and their parents had to attend schools several times in person, work with hand written forms and go through intermediaries; this led to corruption, unfair treatment of some by others (favoritism) and wasted time. The advent of online system has endeavored to remove such inefficiencies, students can now apply for admission, pay fees and register for exams online. All applications are dealt with objectively there is no bias towards any judge based on their prioritization of interviews or irregularities related to the process. Applicants get immediate user-friendly response with electronic receipts and financial transparency. Using it, local education authorities can monitor the complete process in real-time such as number of applicants and fees collected to ensure no fund misuse. These systems also facilitate the creation of student centralized data bases that assist in tracking enrolment patterns, resource allocation and policy development. They are also used to maintain the accountability of records and decrease chances of any discrepancy, manipulation and misuse; unique roll numbers can be generated using these systems and then stored. They can download admit cards, view exam schedules and check results online, which also help in reducing physical contact with administrative staff. It saves time and cost for students but also for institutions, and ensures that the admission process as well as examination across the country is fair and standardized. For officials, checking records, guaranteeing student enrollment and auditing statistics for future planning are rendered more manageable. In general, online admissions and exams registration systems have contributed to improved governance of education by curbing corruption and enhancing service delivery as well as access among both urban and rural students.

Health

What digital health has done The entry of digital technologies in the health space has revolutionized health services in Bangladesh, making them accessible, transparent, and efficient. The government introduced e-Health, telemedicine, DHIS2 and hospital digitalization programmes to enhance healthcare service. These projects are providing real-time gathering and sharing of health records, online consultation services and improved patient record management. The citizens can now consult physicians from their home, so they don't need to go physically rather in places such as a village, where the physician is not available. This is in addition to the accountability made possible by digitized tools - from monitoring resource disbursement and staff performance, to minimizing corruption in drug allocation. In consequence, health care has become more accessible, cost-effective and citizen-centred.

e-Health and Telemedicine Services

e-Health and telemedicine initiatives in Bangladesh, for example, strive to connect urban healthcare centers with rural citizens who do not have ready access to doctors or hospitals. Online platforms and mobile apps now allow patients to receive advice, consultations and even prescriptions from a doctor, without ever having to travel vast distances. Telemedicine centers were established at Union Digital Centers (UDCs), where health workers received training on conducting video consultations with the registered physicians. They save the poor rural house holding with shopping healthcare expense, and guarantee ill-timed diagnosed for primary kind of diseases and maternity. Also, the government leverages e-Health platforms to keep patient records on file, schedule follow-up appointments and send SMS-based reminders for vaccinations or medication. This digital process brings about a more transparent system in terms Intermediaries and fraudulent practices are reduced, also its reap efficiency for delivery of healthcare. Furthermore, telemedicine was instrumental during emergency situations such as COVID-19 by helping to limit hospital crowding and offer patients remote examinations.

District Health Information System (DHIS2)

At the national level, a digital platform called District Health Information System (DHIS2) is utilized for the collection and analysis of health data in Bangladesh. It helps follow disease outbreaks, vaccination coverage, maternal and child health indicators and overall delivery of health services. Health centers across Uganda constantly update patient records that are entered in the DHIS2 for monitoring of services. This guarantees transparent delivery of health programs, enabling policymakers to spot coverage gaps and allocate resources appropriately. By connecting DHIS2, the government can monitor staff performance, trace medicine distribution and chart progress toward health-related SDGs. Paint users too have benefited as fraud and data tampering became a thing of the past and all data is reported accurately from the field. For instance, through DHIS2 the performance of vaccination campaigns is closely monitored to identify underperforming areas. The decision accuracy retrieved from the system, then help decision makers to intervene in time and facilitate optimal resource utilization, improving overall public health services efficiency in Bangladesh.

Hospital Management and Digital Prescriptions:

The use of hospital management systems and digital prescriptions has significantly enhanced the quality and efficiency of providing health services in Bangladesh. Computer systems make it easy to register patients, maintain electronic medical records, manage the allocation of beds, and track billing. There are no more long queues, paperwork, and transparent service fees. Electronic prescriptions eliminate the confusion of clear handwriting and always check patients' medication to ensure they are taking the right medicine. Doctors easily access their patients' records from previous visits and use them for diagnosis and treatment. It also enhances accountability by monitoring employee activity, tracking air utilization, and monitoring the use of the hospital. Automatic systems have reduced corruption opportunities related to the supply of medicines and billing. In addition, clients currently have no trouble waiting for their prescriptions because they can receive them via short messages or online portals. Digitalization makes a hospital more efficient, increases patient satisfaction, and ensures a free and accountable health response system in Bangladesh.

Home Affairs and Immigration

Digital technologies in the Home Affairs and Immigration of Bangladesh have made processes faster, transparent and citizen-centered to move from service delivery. The online model has done away with physical documentation, lowered corruption in all forms of transaction and made end user services like issuance of passport, immigration clearance or police verification easy for the citizens to access. And access to biometric systems, the Internet and electronic payment gateways has made them more accountable, minimized transaction delays and helped restore public confidence in government agencies.

e-Passport and MRP

The e-passport and Machine-Readable Passport (MRP) services in Bangladesh have now made the system for issuing passport in the country modernized. Your E-passport comes equipped with a built-in chip which is capable of storing personal information and data famous for being more secure in comparison to the US basic passport because It's ICAO standard. They can now apply online, book their appointment with the agency and pay fees digitally, slashing a major role for middlemen and chances of corruption. The on-line system also provides opportunity for Applicants to monitor their application at any time and contributes towards transparency. The MRP system, the first stage of digital passports, replaced the manual handwritten passport system and curbed errors and fraud. The e-passport also speeds up the process of passport checking at immigration counters, domestically and abroad. This system has also improved transparency as each stage, from filing an application to delivery of letters is registered in digitized form and officials have become accountable for the delivery. Global databases are used, linking the e-passports and also securing the country against identity fraud and illegal

immigration. On the whole, this service has transformed passport issue into a faster and safer as well as people-friendly process.

e-Immigration Information System

The introduction of the e-IIS (e-Immigration Information System) in Bangladesh, has revolutionized the conventional immigration system by introducing biometric authentication, digital passenger cards and integrating online databases at airports and land ports. This system automatically captures and electronically stores traveler data, "allowing officers to quickly confirm a person's identity in just seconds. Because of fingerprint and face recognition, forging barricade certificates or committing identity theft is much harder now. The database updates on the fly to give officials up-to-the-second entry and exit information, enhancing border security and law enforcement actions. It is connected to international security databases and can help identify people with criminal records or outstanding legal issues. The e-immigration helps to make the system free from corruption, as it takes away human intervention in some manual work which can be misused to extort money from clients. It has also enhanced productivity, reducing the time that travelers require immigration processing and enhancing general passenger experience at ports of entry. This digital migration produces several benefits, including on national security and for enforcing the accountability of immigration personnel, as well as supporting its international standing through the presentation of Bangladesh as a country embracing global good practices in border management.

Online Police Clearance

The online police clearance service in Bangladesh has made it quick and straightforward to get an individual's or company's police certificate for jobs, visa or overseas employment. Applicants used to have to go to police stations several times, experience bureaucratic delays and sometimes pay unofficial fees in order to speed up the process. Thanks to the online system, citizens can now use a web portal to apply for services, scan and upload required documents to the site, pay fees in a digital format and track progress on their applications. This has significantly increased transparency as middlemen and human intervention is stripped out of the system. After the application is confirmed, the clearance certificate is generated on online and can be directly downloaded resulting in reduction of time taken to clear from weeks to a few days. The process is logged on a centralized database, so police officers have to answer for their timely verification and granting issue of the PRC. It also aids in combating issuance of fake certificates as each clearance certificate has a unique verification no, which can be cross-verified by foreign employers or embassies on the MEA website. The online system also increases efficiency, transparency and public confidence, as the service will be deemed to be fair, fast and corruption-free. This project is an important milestone on the road to a 100% digital public service system for policing in Bangladesh.

Agriculture and Rural Services

The delivery of agriculture and rural services has been transformed for the better in Bangladesh through digital ICT solutions, increasing transparency, accountability and effectiveness. Information about crops, animals, markets and subsidies from the government is now just a couple of clicks away on different online platforms for ryots. Digital databases and gateways lower corruption by making sure that subsidies, loans, and farming inputs reach the people to whose names they are transferred without intermediaries. Mobiles services that cater to the requirements of farmers and provide real-time weather reports, pesticide spraying services and cultivation practices have in turn boosted productivity and reduced risks. Government projects like e-agriculture platforms, Krishi Call Centers and mobile applications make it possible for farmers to directly share their thoughts with experts, ask the government about any problem confronting them, and receive a prompt solution. Digital payment systems also help farmers to receive fair deals when they buy seeds and fertilizers as well as selling their crops in markets. Such technologies have enabled to overcome red tape, enhanced the keeping of records and provided a chance for pinpointing decision making through evidence thus contributing to sustainable agricultural growth and better improved rural livelihood.

Agricultural Information Services

In Bangladesh, the concept of Agricultural Information Services (AIS) was introduced as a model to serve agricultural advisories those could obtain by the farmers at their finger-tips in order to make effective and economical farming decisions. Farmers can access information on crop varieties, planting methods, irrigation and pest management, as well as government subsidies via websites, mobile apps and digital kiosks. Under the Department of Agricultural Extension (DAE), e-agriculture portals include agricultural advisories, market prices and government program updates. Such services promote transparency by making information available in the public domain and by reducing farmers' reliance on intermediaries, who tend to distort information for monetary gains.

AIS also provides an important way of holding to account, since farmers experience first hand that no government schemes, subsidy eligible reports or training session is the same. Recording access and data online help in reduction of leakages of subsidies and corruption in input provision. In addition, GIS and remote sensing applications enable government to monitor in real time land use, crop condition and actual disaster impacts.

AIS can also improve efficiency as it allows for faster transmission of messages to farmers and extension agents. Farmers can post queries online, download video tutorials and receive SMS alerts about disease outbreaks or market fluctuations. They allow smallholder farmers to take decisions based on data, improve yields and minimize losses. Therefore, AIS benefits rural development by promoting transparency of policy implementation, enhancing the accountability and equity of resource allocation, downscaling and improving agriculture services.

Krishi Call Centers and Apps

Krishi Call Centers, mobile phone apps are important instruments to offer customized agricultural advice to the Bangladeshi farmers. Farmers may also call the Krishi Call Center at 16123 for expert advice on crop cultivation, pest control, fertilizers and market price. This system is working to assist bridge the information gap, providing another tool to bring transparency that allows farmers directly access non-distorted government approved prices without going through middlemen or local customers or traders who deceive them for personal benefits. They are also responsible for making officers available to reply to phone calls in a fashion that is accountable, as it reduces the risk of bad advice being provided when paid staff provide approved answers and records management so that the quality of service can be monitored. Farmers can also lodge complaints including against subsidies, input distribution and extension services to hold the government accountable.

Mobile applications such as "Krishi Batayan," "Soil Fertility App" and "Krishoker Janala" enable farmers to receive weather forecasts, soil fertility status info, crop calendar and market information. They also have an online registration for either the subsidies, training programs and farm loans. The added value of those services is real-time being the farmers provided instant answers, which in turn shorten decision cycles. Digital tools also enable government to collect data on farmers' needs and farming trends thereby supporting more targeted policy formulation. Krishi Call Centers/applications as drivers of accountability and efficiency in agricultural governance The farmer empowerment, reduced dependence on informal information networks, and fair distribution of resources factors that it facilitates means that the Krishi Call Centers/apps can play a critical role in enhancing accountability and efficiency in agricultural governance.

Computerized Weather and Fertilizer Scheduling Information Systems

Information Communication Technologies (ICTs) based on weather and fertilizer advisory services have revolutionized decision making in agriculture in Bangladesh, delivering timely, accurate and location-specific advice for the use of farmers. Weather advisory services rely on satellite data, weather stations, and forecasting models to provide information about rainfall, temperature, and the possibility of storms. Everything is relayed to farmers via SMS, mobile apps and to community radios that allow time for irrigation, harvesting and protect crops from climate-related risks. They also make weather information transparent by ensuring all farmers, irrespective of their location, receive same government-issued forecasts and warnings. Accountability and ownership have been enhanced as advisory communications are drawn from a sound scientific base vetted by the agencies like the Bangladesh Meteorological Department (BMD), thus minimizing misinformation. Fertilizer recommendation services rely on digital soil maps and farmer information to provide customized fertilizer recommendations in terms of required amounts based on soil fertility and cropping needs. Applications like the "Soil Test-Based Fertilizer Recommendation System" can prevent excessive application or misuse of fertilizers, and contribute to sustainable agriculture while saving costs.

Such measures are efficient as they reduce wastes in inputs, crop losses and increase yields by supporting farmers' decision-making process. Farmers can save unnecessary cost and destruction to the environment while improving productivity. The state also gains from a centralized database that monitors fertilizer demand and gets delivered, which discourages corruption and promotes fair allocation of subsidies.

Through the use of modern science and technology, digital weather and fertilizer advisory systems both transfers knowledge to farmers while building their resilience to climate change, but also improves governance in agriculture including being more transparent, accountable and efficient.

Commerce and Investment

Commerce and the services for investment in Bangladesh are all revolutionized by digital technology, with procedures being made simpler, bureaucratic hassles limited and transparency brought into the whole system. Crucial organizations have embraced e-governance applications in order to expedite business processes. Online company registration, licensing and investment approval platforms have reduced the face-to-face contact that would allow for corruption, thereby promoting accountability. Guidelines can: be downloaded; applications submitted; progress monitored; approbations received electronically. With the advent of digital payment services

and online document checking, we've also added efficiency and lower costs. These liberalizations have made the environment much more hospitable to business, both domestic and foreign. Digital interventions such as, Bangladesh Investment Development Authority (BIDA) One Stop Service, Bangladesh Investment Single Window (BISW), online services of Registrar of Joint Stock Companies and Firms etc. have greatly facilitated doing business. Apparently, transparency and investor confidence have grown, boosting Bangladesh's economy.

The Bangladesh Investment Development Authority (BIDA) OSS

The BIDA One Stop Service (OSS) is a prime initiative for digital delivery of all investment services through one platform. The OSS portal combines more than 50 services of different state institutions, including company registration, tax registration/vat number obtainment, environmental certificate issuance, utilities on-line connection and work permit issuance. By bringing services together, BIDA OSS reduces bureaucratic tangles and minimizes process duplication while making things more transparent. Applicants can apply online, submit the required documents, make payment in electronic mode and know the status of their application immediately. The automated system reduces the amount of face time applicants have with officials, as well which minimizes corruption and delay. Delivery schedules are pre-determined, thus service delivery by the government agencies could be more accountable. Moreover, OSS gives detailed guidance, checklist and applicable laws for the domestic or foreign investors to make informed decisions. The dashboard of the platform enables the officials to monitor service performance, intervene in any chokepoints, and support increasing efficiency. By connecting the various actors – including NBR, utility service providers and regulators BIDA OSS is now a one-stop-shop for investment facilitation in Bangladesh. It has tremendously eased business, reduced approval timeframes and boosted the confidence of investors. The process is paperless and reduces admin costs for investors as well for the state. BIDA OSS has increased overall transparency, accountability and efficiency in service delivery, making Bangladesh an increasingly attractive investment destination.

Bangladesh Investment Single Window (BISW)

Bangladesh Investment Single Window (BISW) is a one-stop service facility; which is based on cutting-edge IT platform to facilitate trade and investment by bringing together all the regulatory and service-provider agencies under one window. BISW has the facility to enable investors to work in a frictionless and paperless environment with online services form business set up, licenses, permissions, customs clearance and regulatory approvals. Investors can apply, pay and monitor the status of approvals in real time using BISW. The platform facilitates inter-agency collaboration by connecting various agencies such as customs, port community, tax authorities and regulatory agencies. De-emphasizing personal contacts, human interventions and discretion in BISW helps reduce scope for discretion, corruption thus improving transparency and accountability. The system also includes standardized timelines and processes, which provide more predictability and efficiency to the investment process. Performance monitoring and the identification of areas for further reform can be conducted in BISW using data analysis. Furthermore, BISW supports global trade facilitation by adhering to international best practices like the World Trade Organization (WTO) Trade Facilitation Agreement (TFA). And it helps Bangladesh climb the global ease-of-doing-business rankings by streamlining administrative burdens for investors. By computerizing investment and trade process, BISW saves business time and costs, increases competitiveness, allows in foreign direct investment. Effectively interfacing with other e-government services, such as BIDA OSS and RJSC, BISW also enables the development of an integrated digital ecosystem for Commerce & Investment Services in Bangladesh contributing to economic growth and private sector development.

Company Registration and License through RJSC

Online Company Registration Since its inception, the RJSC has been responsible for establishing an online system to submit new company applications, track previous submissions, look at office diaries and most recently do statutory filing over the internet. Companies, partnerships and societies can be registered for the first time ever within days and hours by entrepreneurs in their living room without having to visit any office. Users are enabled to search the system for available names, file applications and supporting documents as well as make payment online. Details of applications can then be tracked, in real-time, once the application is submitted. This computerization has greatly reduced the time taken and also cut down on possible bribe by reducing interface with official. Also, RJSC's database system provides for all company datas, annual returns and others statutory e-filling which enables it convenient for Investors, Banks, Regulators to verify the credentials of the companies. This strengthens the sense of being held accountable and for legal compliances. The platform also provides digital certificates that can be verified, and fabricated. It collates information from other agencies like NBR is TIN, and BIDA OSS for investment services thereby advocating an easier business startup process. This online system is in line with government aspiration to Digital Bangladesh and has also contributed towards enhancing the country's ease of doing business indicators. RJSC's digital platform promotes innovation, fosters investment and promotes

good governance in the corporate sector by creating a user friendly environment through transparency. Automation of business registration and licensing lowers risk for investors by ensuring a more standardized regulatory regime that is effective, thus stimulating the expansion of private sector activities and supporting economic development.

Transport and Communication

Bangladeshi transport and communication is the new era of online services, smart transports and e-ticketing system provided by digital technologies. These measures are for the reduction in corruption, decrease of manual hurdles and to make it more convenient for citizens." However, platform like BRTA online service facilitate digital license application and tax token renewal without any intermediaries. Intelligent Transport Systems (ITS) monitor and manage traffic and roads with GPS tracking, CCTV, and automatic traffic signals. So is the case with online railway and bus tickets, it means no longer queues; it also ensures fairness in ticket distribution and see to transparency in collection of revenue. Together these services enhance effectiveness, accountability, and citizen satisfaction.

BRTA Services (License, Tax Token)

Bangladesh Road Transport Authority's (BRTA) initiative to introduce several online services including driving license applications, renew and vehicle registration as well as issuance of digital tax token. Now, the citizens do not have to come multiple times and can apply for or renew the licenses, pay fees as well as monitor its progress online on the BRTA website. This reduced the magnitude of corruption as it eliminates dealing with brokers and their accomplices. Digital Payments made through cell phone banking or internet banking; this makes sure people can easily go into all their deals. Furthermore, QR code digital tax tokens are issued which the traffic police can easily check on to discourage fake tax payments. The digital platform also collects cars and licenses to one central database, which allows police officers to verify identities at once. Applicants get notified with SMS and emails on status & situation of their application. Online services of BRTA removed the old paper based process and increased productivity, saving time for citizens; reducing administration burdens, also streamlined the office activities upgrading delivery times. Overall the system has increased transparency, accountability and citizen's confidence in government services.

Intelligent Transport Systems (ITS)

Inception of ITS in Bangladesh The handover and installation conundrum has not in any way outdone the welcoming the ITS solution that is now known as Traffic Signal system. It includes features like CCTV cameras, GPS tracking, auto signal systems, speed check cameras and display of digital data on highways. Such a surveillance system would allow traffic police to watch vehicles on the roads, spot offences from base stations and use automatic systems to issue fines by post all of which can reduce bribery. Similarly, public buses and freight vehicles can also be tracked by GPS to guarantee the routes are respected and there is no "exaggerated" charging from transport operators. ITS technology provides a data basis for urban planning to make decisions, based on traffic travelling patterns, hotspots of accident locations and time points of congestion status. The automatic operations of traffic lights have eliminated the old delays for cars traveling between Wyoming and New York. Through the integration of digital payment for fines and enforcing via surveillance video, the accountability increases in traffic management provided by ITS. These technologies also offer the public traffic updates for their mobile devices, which help with route planning. At the end of the day, ITS means more efficient, transparent and sustainable urban mobility.

Online Railway and Bus Ticketing System

Companies such as Bangladesh Railway and intercity bus services have introduced online ticketing system, where an individual can make reservation, payment and collect digitally through their websites or mobile apps. The Bangladesh Railway e-ticketing service, app services to provide tickets and other services have stopped their queues for long waiting hours. Travelers can also check availability and select seat of their choice apart from making payment through mobile banking or card (debit/credit). The digital system creates QR-coded tickets, which is expected to minimize possibilities for ticket fraud and black-market sales. For intercity buses, platforms such as Shohoz, Bdtickets, and Busbd facilitate online booking for a fair distribution of tickets and price on the market. Automated refund features are also supported, making use more convenient. The web interface ticketing system enables authorities to easily monitor the secure sales of tickets, passenger details and revenue collection, minimizing revenue loss as well as corruption. Additionally, around festivals and special occasions, digital ticketing also prevents touts from hyper buying which the rest of system is capable of controlling with national ID and limit tickets by quotas per person. These measures have improved effectiveness, saved time and enhanced oversight and accountability in the operation of transportation services for passengers. In general, Online Ticketing Systems is a big leap towards an open and citizen friendly public transport system.

Energy and Utilities

Digitalization of energy & utility services in Bangladesh, technology has raised the level of service and convenience for utilities upgrading operational efficiency even while western nations are lagging behind. Rationalization of services, online payments and advanced systems for monitoring power theft have minimized opportunities for the disruption of revenue handling by manual error or delay. Smart grid initiatives make it easier to manage energy and detect outages. These online tools enhance transparency, sharing actual usage and billing information with customers to help avoid disputes and instill confidence. Together, these innovations enable public utilities to maximize resources, minimize losses and provide more consistent service to end users.

Prepaid Electricity Metering

Transformative digital innovation: In Bangladesh pre-paid electricity metering is providing opportunity for consumers to pay upfront before using the electricity in a transparent manner like mobile prepaid credit. This platform completely overcomes the cloggy postpaid billing system and prevents squabbles and defaults that hurt utility providers. Customers buy credit either on the Internet or from licensed vendors and then load it onto their meter, as usage is debited in real time. Enable to monitor the consumption and costing of your devices on app in real time, and use more rationally, promote energy saving. Pre-paid metering is also seen as a way to help utility companies minimize financial looses due to unpaid bills, better cash flow, and increased visibility into revenue collection. In addition, it reduces meter reading and billing costs. Ultimately, the prepaid system also assists in combating power theft by allowing for more precise tracking of energy consumption. Prepaid metering is a win-win arrangement for both customers and distributors, realizing fair, transparent and efficient electricity supply mechanism by putting digital payment as well as metering technologies to use.

Payment of gas, electricity and water bills on the Internet

Systems for paying bills online to gas, electricity and water utilities have brought a sea-change in consumer convenience and service delivery efficiency in Bangladesh. With the aid of these digital platforms, users can settle their utility bills at any time and from anywhere over the web or on mobile applications without having to go personally to payment centers. This functionality allows us to ensure on-time payment so late fees and shut-offs are reduced. The e-system also gives immediate payment confirmation and virtual receipts, which increases transparency and minimizes risks of cheating and manipulation. Online payments generate higher cash flows, lower handling fees and error rates associated with manual handling for utility companies. The platform also allows customers access their billing history and usage profiles via the web, creating a conscious balance of consumption for users. This is in addition to the several payment methods (m-wallet, cards, bank transfer) that are integrated on our platform. In general, online bill payment systems help improve process efficiency reduce scope of corruption and enhance user experience in the utility section of Bangladesh.

Smart Grid Initiatives

Bangladesh's smart grid programmes-are a step towards modernizing the electricity distribution networks with new digital technologies. A smart grid applies sensors, smart meters and communication networks to capture and analyze real-time data related to power generation and consumption. This allows utility companies to track grid performance, identify faults rapidly and distribute power more efficiently. In Bangladesh there are pilot smart grid projects towards lowering power outages, balancing load and better integration of renewable energy sources. Smart grids also give users information on real-time electricity consumption in the hopes that they will turn off appliances when electricity prices are high. Furthermore, having a more intelligence grid can better monitor and decrease the technical losses as well as power theft which are important challenges plaguing Indian power sector. Through the automation of numerous manual tasks, smart grids also make operations more efficient, which translates into lower costs and better service reliability. Eventually, implementation of smart grid facilitates sustainable energy management and adds to Bangladesh's larger plans for energy security and environmental sustainability via digitalization.

Environment and Disaster Management

Bangladesh's use of digital technology for environmental policy and disaster response is vital. In a region prone to frequent natural disasters such as floods and cyclones, collecting data and analyzing it in real time helps policymakers prepare for, and respond rapidly to, crises. Systems such as Geographic Information Systems (GIS) and early warning system automate accurate monitoring of environmental changes, disaster or risk. This tech-enable process helps coordinate government functions, and improves resources management and distribution. In the end, these technologies help reduce destruction from disasters, save lives and create a sustainable environment.

Digital Mapping and GIS

Digital mapping and Geographic Information Systems (GIS) play a vital role in environmental and disaster management system of Bangladesh. GIS combines spatial and geographical data into detailed digital maps used as aids for decision makers to visualize and analyze environmental and disaster information. Such maps are used to keep a tab on deforestation, land use changes, water bodies and urban spread that are crucial for environmental conservation. In disaster management, vulnerability mapping is facilitated by GIS as it overlays the hazard (i.e., flood, cyclone or river erosion) data with demographic and infrastructure data to identify susceptible regions. It adds to risk analysis and disaster preparedness planning. Hijacking evacuation orders and resources Decisions can be optimized using GIS tools that will help pinpoint potential weakness of those being evacuated. Moreover, integration with GIS and satellite imagery as well as remote sensing for real-time monitoring of environment that can be used in advance warning of natural calamities. Government departments in Bangladesh are using GIS for better land management, urban planning initiatives, and even climate change adaptation strategies – and so digital mapping is vital to the country's sustainable development and disaster risk reduction goals.

Early Warning Systems

Early warning system is one of the most important digital devices used in Bangladesh to reduce the impact of natural disasters like cyclone, flood and storm surge. Such systems collect real time information from weather stations, satellites and sensors to foresee imminent dangers with some degree of accuracy. Information is passed through various communication outlets like SMS alerts, mobile apps, television, radio and loud speakers to alert the vulnerable sections of the society ahead of time. These systems can issue early warnings to communities and governments, promoting actions such as evacuation, property protection, and emergency services deployment. Moreover, the application of modern communication technology has greatly increased the scope and immediacy of warnings, saving untold numbers of lives with accompanying reduction in property loss. Moreover, early warnings are frequently connected to disaster management centers for streamlined response and resource allocation. The continued refinement of the accuracy and granularity of data, prediction models, and distribution approach can also serve to increase resilience in a country such as Bangladesh which constantly finds itself under threat from various natural hazardous events.

Climate and Disaster Risk Dashboard's

Climate and disaster risk dashboards are digital tools for aggregating and visualizing essential information on environmental hazards, climate change-related dissemination, and disaster risks in Bangladesh. Such dashboards are being populated from various sources including meteorological departments, satellite imagery, river gauge stations and social media for real-time situational awareness. Dashboards, by displaying this data in interactive charts, maps, and real-time alerts, support government bodies checking policies and the public making decisions. They provide a proof of principle monitoring system for weather, flood levels, cyclone paths and climate trends which can be used to guide early actions in risk management. Further, dashboards aid in scenario analysis for impact prediction to better plan disaster preparedness and climate adaption measures. Data are transparent, available to many stakeholders and will enable cross-sectoral cooperation. Solidifying its commitment to invest in digital tools such as these, Bangladesh will see more efficient resource management, well-coordinated disaster response and proactive intervention to mitigate the impacts of natural hazards and climate disasters on vulnerable communities.

V.   Challenges And Barriers

Infrastructural Limitations

Delivery of e-governance in Bangladesh continues to remain limited due to critical infrastructure challenges, particularly in rural and remote regions. A significant number of Union Parishads and Upazila-level offices do not have reliable, high-speed internet connectivity, due to coverage gap. In broadband accessible areas online platforms are generally slow or not functional because of low bandwidth and intermittent connectivity. Electricity is often available only erratically; voltage fluctuations and outages damage equipment and interrupt essential digital services.

Then, many local government offices are slim on modern technology lacking printers and scanners or tablets and PCs. It's difficult to expect employees to handle their digital documents the way they were handled before because in many cases, the devices of today are outdated so slow and break down all the time. Service outages are compounded by insufficient backup power solutions, like solar panels or inverters. These bottle necks directly impact on various services which needs to be delivered online but due to one or other kind of restrictions in-person/intermediary handling is expected many a times for grievance tracking, digital payments, certificate issuance and submitting the application. That would increase delays, out-of-pocket costs for citizens and the likelihood of inefficiencies. Because of the digital gap between cities and countryside, there is hardly any

availability of these services to countryside people that would prevent adoption disproportionately, and further increase inequality.

This infrastructure deficiency not only weakens internal operations but also user accessibility. Controlling the pace When administrators find themselves having to complete tasks that could be automated or waiting for systems to respond, chances are good the workflows are taking longer than necessary. Ultimately, robust e-governance portals cannot be expected to function properly without uninterrupted access to electricity, high speed connectivity and active electronic gadgets. All effective digital government strategies need to begin where infrastructure is concerned — with investments in reinforcing the physical infrastructure, which in turn includes building out fiber or wireless broadband, ensuring a reliable power supply and furnishing local offices with well-maintained hardware.

No Skilled Human Resources

Absence of ICT–Skilled Public employees at LG level is another bottleneck in implementing e-governance. Many Union and Upazila officers struggle with using digital mediums, including filling online forms, managing dashboards or records digitally, or diagnosing complex bureaucratic workflows. These officers also often work with outmoded paper-based procedures or intermediaries.

Formal training programs are limited in number and extent. Short workshops may touch on the basics of e-services, but they do not provide continuing hands-on experience or aftercare. If they do not continue receiving capacity building, many officials are not able to apply their learning or adapt when systems change.

Generational divides and resistance for change are also bring some hold back in implementing new systems. Others may be unaware of how to access the cloud, send an e-mail or type in Bangla. And employees may not spend the time learning digital tools if they don't see incentives or reward, especially when performance reviews still measure return on traditional clerical productivity. In frontline workers' wake, more than half of the supervisors and a fair share of IT managers and technical support staff bear a similar skills gap. Simple problem solving is prevented and system up time is delayed without access to IT support. When issues like payment gateway crashes, sign-in errors or system glitches happen officials often don't know how to deal with them…which makes the public have less confidence in digital services.

Ultimately, a crew without the skills and digital literacy will stymie adoption, never fully utilize digital platforms and drive manual work-arounds. Education that combines technical skill and behavior change must be in-depth, sustained, and contextually appropriate. Service delivery and public confidence might be reinforced by insisting ICT literacy is a precondition for employment, providing ongoing coaching with help desks, and instituting career paths for digitally literate public servants.

Legal and Policy Gaps

While Bangladesh has enacted ICT related laws such as the Digital Security Act and ICT Act, there are significant legal and policy vacuum which sustains distrust over e-governance system. Critical cybersecurity, privacy and data protection frameworks are still missing. There is no overarching independent data protection legislation nor an authority established to regulate the collection, storage and sharing or deletion of citizen data. It is precisely this ambiguity that fuels a natural concern about abuse, or the unauthorized manipulation of personal data.

It gets even murkier are the responses of invoking accountability and supply side of digital services. The new responsibilities for M&S steps where policy shows tension between manual and newly digitized processes and how responsibility is assigned when it also involves other agencies. In such a scenario, responsibility for errors, delays or data breaches may become cloudy.

Policy vacuums likewise prevent collaboration between the departments from being effective. The ministries and departments have been developing silo systems as there are no standards for interoperable (exchange) of data." These don't share a common architecture, making it difficult to seamlessly share citizen records. For instance, a birth certificate database may not integrate with local tax databases or the national ID system. The systems are also limited in that they have no governance policy which details the system's encryption protocol usage, how identities are to be verified within the system, or APIs. "Cybersecurity regulations are still in their infancy, there aren't a lot of mandated standards for things like incident response plans, regular audits and encryption or proper access controls at rest or in transit. Local agencies often do not prioritize investment in secure infrastructure when they are there is no requirement by law to do so.

Plainly, the legal and policy climate needs to be bolstered. The government on its own timetables would need to craft broad-based law to adequately protect people's data, independent oversight bodies, agency-wide standards for data architectures that can interconnect or fly in tandem across agencies and cybersecurity best practice deployment and update" you can throw the kitchen sink of insider-outsiders at an issue like this. It is these enablers which are critical to making scalable and accountable e-Services of all forms a reality right across Bangladesh, as well as to building trust in digital Government.

Inter-Agency Coordination Problems

Smooth connectivity among ministries, departments and local bodies is necessary for the success of e-governance. Unfortunately, many government departments in Bangladesh operate in silos. They maintain independent data bases, vest portals and services which result in fragmented citizen records, duplication of effort for data entry and multiple administrative interfaces. Overlapping private information is often collected by social welfare service organizations, tax bureaus, land registries, health authorities and local governments. Because their systems do not talk to one another, citizens might be required to submit the same information to many departments. Aside from the waste of time, energy and resources this duplication poses a potential for fraud or error.

There is little, if any, flow of information across agencies. Even when solutions are shared, they often come together ad hoc without any coordinated standard practice. Even if it were there, digital infrastructure leaves gaps in this kind of interoperability. The challenge is even reinforced when each department employs different software vendors, data formats or coding schemas. Institutional culture is also a barrier to coordination: departments fear losing control and revealing internal inefficiencies if they share their data. Without the common standards or decentralized governance, agencies will not have incentives to collaborate. The result is slow service delivery; as data pass from one agency to another, applications that should take hours to process can instead drag out for days or weeks. Running parallel systems, especially when they don't talk to each other, can be administratively costly and confusing for citizens, who're often forced to contend with uncoordinated records or a chopped-up case history.

A strong centralized e-governance authority should also be formed to prescribe and enforce interoperable standards, procedures for exchange of data (such as APIs), common digital identity (like NID or even a few digital tokens) and shared infrastructure facilities. Collaborations between departments on data governance, shared service centers and interdepartmental governance councils could simplify digital delivery across the whole of Bangladesh, break down siloes and eliminate duplicate efforts.

Cybersecurity Concerns

As Bangladesh accelerates its e-governance drive, government databases have emerged as hotbeds of ransomware, phishing scams, hacking attempts and cyberattacks. Government systems contain a great deal of critical citizen data and are often not well- encrypted or monitored for breaches. That includes tax data, land records, national identification numbers and health information. Many city offices are highly susceptible to attack because they have shared user accounts, antiquated software or weak passwords. A single vulnerability can erode trust, as seen in recent cyberattacks on government agencies in Bangladesh and elsewhere. Furthermore, there are often no response plans and IT security teams on location. Officials might not know how to protect systems, limit breaches or communicate with affected citizens in a cyberattack. Penetration tests, system updates and cyber hygiene training are hardly routine in many government agencies. Unconscious employees can fall victim to malware or phishing and inadvertently compromise systems. C", "Ultimately servers that are quickly hosted with no redundancy can result in a loss of data that is not recoverable from more than one attack.

Because there is no one unified national cybersecurity standard that all departments of state and local government are required to meet, cybersecurity is both a technical and a policy challenge. The Digital Security Act covers cybercrimes, but it does not provide sufficient guidance about how to manage cyber risk at the infrastructure level. Protecting personal information calls for purchasing network firewalls, multi-factor authentication technology, robust encryption and regular audits on top of hiring trained cybersecurity professionals. That could be achieved by the government establishing a national Computer Emergency Response Team (CERT) with regional outlets to promptly track, shutdown and manage these attacks.

Digital Illiteracy Among Citizens

A significant portion of Bangladesh's rural population is unable to avail digital services when accessible simply because of lack of digitization-literacy. There are some who may not even be aware that there exist online services or government portals to where they can file complaints, pay and do their applications. Even for those who know, they may lack the technological savvy to deploy mobile financial services in order to complete online payments and installations of apps or perusing websites. Digital platforms are intimidating for many elderly people and those with low levels of literacy, so they go to middlemen like neighborhood computer stores or agents. Intermediaries are frequently fees, misinform or intentionally delay in providing services to exploit such dependency, and such dependence causes corruption.

Another hurdle is language because most digital platforms are only partly English or there exists an administrative technical lingo that the average person may not understand. Bad user interfaces and too little explanation keep first-timers away. Over three-quarters of rural dwellers on the other hand are accessing the internet on a smartphone, yet government websites often don't load properly for them. Mass campaigns for digital literacy needed to bridge this gap. At the very least, simple online service usage (say how to pay bills, track

applications or apply for certificates) can be trained through training programs conducted by Union Digital Centers, NGOS and educational institutions. Lively public interaction might also be enhanced by simplified interfaces, voice-driven instructions in Bangla and extensive use of local media for promoting awareness on e-services.

Resistance to Change and Bureaucratic Mindset

In addition to increasing transparency and decreasing manual paperwork, e-governance creates digital traces that may reveal corruption or inefficiencies. Because they worry about losing their unofficial revenue streams or being held more accountable, some officials are reluctant to implement digital systems. Many offices have a bureaucratic culture that is hierarchical, sluggish to change, and dependent on strict regulations, which inhibits innovation.

Traditional paper-based procedures may be preferred by older officials, who may find new systems overwhelming. Even when there are digital services available, some employees purposefully discourage citizens from using them, instead referring them to manual processes that permit favoritism or unofficial payments.

Anxiety about job security is another factor. Clerks and intermediaries fear that their jobs will become less important as processes become more automated. Digital reforms are frequently only partially implemented in the absence of strong political commitment; systems are introduced but not enforced, resulting in both digital and manual modes of operation.

Leadership-driven change management is necessary to meet this challenge. Recognition, promotions, and career benefits for officials with digital skills are examples of incentives for digital adoption that can boost involvement. Resistance can be decreased by requiring the use of E-Systems that are connected to performance reviews. In order to give employees a sense of ownership, training programs should stress that digital tools streamline tasks rather than replace them.

Financial Constraints

Significant financial resources are needed for the development and upkeep of e-governance systems, including for infrastructure, software development, server maintenance, cybersecurity, employee training, and awareness-raising. Budgetary resources for ICT initiatives are still scarce, especially at the local government level. Many Upazila offices and Union Parishads lack the specialized funding needed to maintain servers, buy new equipment, or pay for internet subscriptions. A lack of maintenance budgets often causes systems to fall into disrepair after initial ICT projects funded by international donors and development partners come to an end. Additionally, government IT equipment procurement processes can be cumbersome and slow, which delays the adoption of digital solutions. Infrastructure receives more funding than cybersecurity in particular. Without consistent investment, systems continue to be antiquated and susceptible to attacks. Budgetary restrictions also make it impossible to hire qualified IT workers, so many local offices rely on inexperienced or part-time staff to provide technical support. Bangladesh requires a dedicated, long-term ICT budget for all administrative levels in order to overcome these obstacles. To create affordable solutions, public-private partnerships (PPP) may be investigated. Centralized procurement, shared cloud infrastructure, and open-source software can lower expenses while guaranteeing that every region gains an equal share. The long-term viability of e-governance depends on a sustainable funding model.

Language and Accessibility Barriers

Despite Bangla being the official language, many government websites and applications are only partially in English and use bureaucratic or technical jargon that is difficult for the average person to understand. Accessing essential services or navigating online forms is particularly challenging for citizens with disabilities or low literacy. Furthermore, despite the fact that mobile phones are the main means of internet access for users in rural areas, the majority of platforms are not responsive to mobile devices. Websites frequently lack accessibility features like screen reader compatibility or voice guidance for individuals with disabilities, such as the visually impaired. Vulnerable groups are left behind as a result of this exclusion, which lowers the inclusivity of digital government services. All government websites and mobile applications should adhere to international best practices for user interface design, which include minimal form complexity, audio and video guides, and simplified Bangla language, in order to guarantee true accessibility. In order to assist users with disabilities, platforms must also adhere to the Web Content Accessibility Guidelines (WCAG). Barriers can be further decreased by creating mobile-friendly apps with offline modes for places with poor internet, implementing voice-activated instructions, and utilizing AI-powered chatbots in Bangla. Increasing public input throughout the design process can also guarantee that platforms address the population's real needs.

Monitoring and Evaluation Issues

Shortage of monitoring and evaluation (M&E) haunts numerous e-governance programmes in Bangladesh. There is too often little follow-up once a project is begun, to determine if the service appears to be working well or being well received by citizens and needs adjusting. Problems such as downtime, low user adoption, or poor service quality will go undetected for quite some time if data is not collected properly. Departments seldom report on performance digital services. Nobody measures and publicly announces metrics that commonly measure system reliability, (think uptime), user satisfaction scores or app processing times. The result is inefficient systems and no accountability.

While some have introduced complaint mechanisms, the systems for collecting information from citizens are far less developed and responses are consistently lacking, or slow in coming. Without recurring audits or external measures, it can be difficult to ensure upgrading. Transparency can also be improved by setting up KPIs (Key Performance Indicators) for digital services, mandating public dashboards that report on real-time performance and regular audits from independent organizations. To ensure that services are reliable and citizen centered, citizen feedback can be collected using surveys, call centers and social media. Regular M&E ensures that e-governance is a living process and attunes itself with societal developments and technological advances.

VI. Recommendations

Introduce into law modernization of the protection of personal data and oversight

Bangladesh requires a comprehensive Data Protection Act to secure its citizens' private information and to maintain trust in digital public services. An existing protection in the ICT and Digital Security law is piecemeal and contains lacunae such as lawful data processing, purpose limitation, breach notification, cross-border transfer. A new law should spell out how government agencies and private companies gather, process, store and share consumers' personal data. It should create a fully-fledged, apolitical oversight body with the power to investigate complaints, impose sanctions and ensure compliance. Public consultation at the draft stage would be a means of making the process more democratic and of ensuring that law is responsive to both citizen concerns and administrative realities. The law should be interoperable with Bangladesh National Digital Architecture (BNDA) standards for secure data sharing and require Data Protection Impact Assessments (DPIAs) for high-risk systems like the National ID, health records, and land registries. The legislation must be properly funded, with a Data Protection Authority and professionally trained DPOs in place for every ministry. This would inspire citizens' trust, facilitate adoption of e-services and support Bangladesh in reaching the global level of data security necessary to enable international digital cooperation and investment.

Standardize interoperability as a requirement of BNDA by default

Even though the Bangladesh National Digital Architecture (BNDA) is an attempt to standardize how government systems exchange information non-compliant data exchange still remains. If BNDA were mandatory, data silos and redundancy would be lifted, making service delivery between ministries seamless. Systems would "speak" to each other without human intervention if there were interoperability through certified Application Programming Interfaces (APIs) and shared data models for people, business and land parcel. A national API catalog must be published and every new digital system must be Banco said compliant before going live to achieve this. The government may establish an organization-wide enterprise service bus (i.e. Shared Integration Platform within the e-Government Cloud) to ensure safe and real-time data sharing. Using interoperability from the outset also has the potential to enhance user experience, reduce development costs and accelerate digital transformation in Bangladesh. Moreover, it is in line with "once-only" policies that users should provide their data only once for reuse across multiple e-services. Advanced e-services such as integrated land management, single-window business licensing, and real-time social safety net verification all vital elements of a coherent, efficient and citizen-friendly digital government will be anchored on robust interoperability.

Turn cybersecurity from a theory to reality

There are existing cybersecurity rules and regulations in Bangladesh also, but it is a long way to march on for establishing reliable and measurable protection against cyber threats. Genuine, consistent secuny is needed to safeguard sensitive citizen information contained in databases like the NID registry, land records and social protection databases. As prescribed in ISO 27001, a cybersecurity baseline should be set across government to define the minimum security controls that must be applied; including multi-factor authentication, data encryption in motion and rest, safe coding guidelines, logging rules and an acceptable patch management compliance date. All key systems should be subject to regular penetration tests by independent testers. Control of cyber threat detection, response, and restoration could be accomplished by establishing a Government Computer Security Incident Response Team (CSIRT). Mandatory 72-hour incident reporting would foster accountability and promote containment without delay. Human-factor related risks can be reduced by implementing periodic cyber awareness campaigns and simulated phishing practices for public employees. Ensure sustained investment

Securing constant budget is key, so cybersecurity budgets should be ring-fenced for all departments and local government bodies. Bangladesh is well-positioned to maintain the trust of its citizens, secure an increased digital infrastructure and comply with international standards required for cross-border cooperation and digital trade by baking security into operations rather than bolting it on as an afterthought.

Design for the citizen (Mobile first, Bangla first and accessible services).

If e-governance is going to mean something substantial for all the citizens, service design needs to focus first and foremost on this trifecta – accessibility, local language and mobile usability. Even though many services are developed for desktops or English-based interfaces, rural and low-income consumers in Bangladesh use phones. All government websites and apps should be available in simple Bangla, mobile first, and fully WCAG compliant. There should be compulsory users experience recommendation, also usability testing in the several urban and rural settings to identify and clear barriers. To ensure that citizens who do not have a smartphone or lack literacy can be included, the services need to have alternative delivery channels apart from the web-based platform, including USSD codes, IVR hotlines and chatbots in Bangla. For users with disabilities, voice-guided navigation and clear visual cues may improve accessibility. As assisted-digital hubs, UDCs ought to be used for face-to-face support of people incapable of using the services on their own. The government can ensure fair access, reduce the digital divide and increase the take-up of online services by designing with citizens not just for them. This would be both more efficient and better service to the citizens.

Minimize the Last-Mile with stronger, more sustainable UDCs

In rural Bangladesh, the solution for delivery of digital services are UDCs but they also suffer from a variety of issues such as shaky operations, funding inadequacies, and substandard quality. Government needs to create a sustainable funding mechanism ensuring a constant resource pool for staffing, equipment and infrastructure to maximize their value. Centers that meet their service delivery targets, achieve high levels of customer satisfaction and expand into new service areas, such as digital payments, identity verification and land transactions or social protection enrollment. May be eligible for performance-based grants. In this way, reviewing the quality of service and professionalism becomes possible for UDC entrepreneurs while ensuring that uniform standards are maintained throughout the country. Evidence-based remedial measures and better monitoring would flow from the inclusion of UDC performance indicators as part of national e-governance dashboards. Financial sustainability of UDCs can be improved though expanding programming through collaboration with private sector service providers. By scaling up and maintaining UDCs, Bangladesh can reach the last-mile connectivity and ensure that even its most remote citizens have access to state-of-the-art, reliable, and inclusive digital public services.

Make digital identity and trust services formal Digital identification is the yardstick by which we will measure digitalization in future.

Securing functional e-services that are 100% online in Bangladesh entails the establishment of safe, pervasive and trusted digital identification system for providing reliable electronic signature services. The current set-up has no robust, coherent infrastructure for secure digital authentication and binding e-signatures (although the National ID card is often used as a means of verification). Such transactions as signing documents and contracts, doing business on-line or reaching out to the government would be performed 100% online without physically going over to the government if Public Key Infrastructure was made more accessible along a Government PKI (GovPKIservice). Cloud-based signature services, mobile PKI solutions and remote e-KYC procedures Electronic Know Your Customer (e-KYC) procedures And will help raise the adoption especially in smaller businesses and rural areas. A legal recognition of e-signatures on all court filings, contracts and administrative matters will drive digital transformation as well as certainty. This trust framework's holistic integration across ministries would enhance transparency, reduce fraud, and expedite service delivery. By the establishment of digital ID and trust services, Bangladesh can encourage secure, end-to-end citizens-friendly, e-governance applications that are efficient.

"Measure what matters": service dashboards and public KPIs

One of the key weaknesses in Bangladesh's e-governance initiatives has been the lack of open, real-time performance-tracking mechanisms. Since they aren't followed publicly, many projects that begin to great fanfare simply disappear without a trace. In order to tackle these issues, any major e-service has to track and report on KPIs such as system availability, transaction processing time, success rates, user satisfaction or how long users have spent dealing with complaints. The KPIs should be visible in a centralized public dashboard hosted within National Portal/ MyGov. Ministries should be required to update data monthly (ideally via automated feeds). To hold leaders accountable would be to include their senior officials' performance appraisals dependent on delivering service-level agreements (SLAs). Public dashboards would enable the government to target bottlenecks

and more accurately allocate resources while enabling citizens, in turn, to hold institutions accountable and see for themselves how effectively services are being delivered. Transparent assessment of performance will ultimately shift towards continuous improvement and the public will have more confidence in digital services.

Strengthen e-participation, especially e-decision-making

"Despite considerable development in provision of e-information and e-consultation, Bangladesh has yet to fully embrace real-time e-decision-making (policy is shaped directly by public feedback)". There is a need for a transition from simple feedback forms to more structured engagement processes in order to enhance e-participation. All government consultations could be coordinated through a national E-Consultation Portal, with clear descriptions of proposals and summaries in Plain Bangla and offering online interactive or assisted interfaces (e.g., Union Digital Centers) for citizen comments. Ministries should have to produce "you-said/we-did" reports which show how input influenced their final decisions. Participatory budgeting tools, both local and national, could be set up to allow citizens to propose and select spending priorities. Digital town halls in rural community centers and broadcast online can also make it possible for citizens to be part of government discussions. And where those responses could be released as open data, preserving privacy but aiding transparency and informed discussion. By integrating structured, two-way digital engagement into the formulation of policies, Bangladesh can enhance the legitimacy of policies and build trust among its citizens and develop services that are more responsive to their needs.

Revise digital financing and acquisitions mechanisms

Bangladesh's digital projects often get stuck or suffer sustainability issues due to archaic procurement processes and short-term funding. To meet international benchmarks, e-Government Procurement (e-GP) system developed by the Government shall be up-graded with contract management, supplier performance monitoring and Open contracting data protocol modules to e-GP apart from acquisition. More transparent supplier performance rankings would dissuade poor performers and promote high quality delivery. To prevent the "post-donor cliff," where on-line project closes down following donor's funding, digital systems also require multi-year operations and maintenance (O&M) commitments. Prototyping was also encouraged by a framework agreement on software development, cloud services and cybersecurity tools that could help speed procurement and administrative wait times. Standardization of open-source adoption across government might further decrease costs and drive greater flexibility. Bangladesh can ensure that digital transformation initiatives are timely implemented, within budget and sustainable in the long run by speeding up, making transparent and tailoring procurement to technology's rapid pace.

Life-event, one-stop services

Bangladesh's citizens now need to jump between several government agencies and repeat the same documents. Make the system much more citizen friendly by reordering services around life events such as birth, education, starting a business, farming, building a house or retirement. Read more: Model – Making it easy to access Bangladesh has an automated way of sharing data between agencies (Bangladesh National Digital Architecture [BNDA]) and each life event becomes a single online service bundle where the citizen fills only one form. As soon as a child is born, the population registry could be updated; an electronic birth certificate issued; and eligibility screening for health and education benefits commenced. Consent-based exchange of data would ensure only authorized applications and safe re-use after granting consent to personal data. Applying the "once-only" principle enhances user experience, and reduces paperwork, processing time and errors. A life-event-based service design model could be adopted as the underpinning organizational focus for all government transactions in the future that would give rise to an efficient, dynamic and responsive public service environment.

Services on land which are safe and accessible

Because of its complexity and prone to dispute nature, land administration is one of the most pertinent sector for full digital turn-effected process. The government can set a precedent for other industries by making land the leading "end-to-end digital" case. Essential components must include online e-mutation application, digital cadastral maps, electronic payment and legally acceptable e-signature in real estate transactions. Applicants would be kept updated through SMS or app-based application status updates and there will no longer be the need for regular visits to land offices. Integration of the land information management system (LIMS) with National ID database and courts would allow reliable ownership verification, and faster dispute resolution. There would be less opacity and fraudulent transactions if anonymous cadastal data where freely accessible whilst the identity kept more private. Aside from serving citizens, the efficient and secure land service will also enhance property rights, attract investment and reduce opportunities for rent seeking in land governance.

Digital literacy and inclusive skills at scale

These are useless without pervasive digital literacy and the capacity to use them effectively. Even the most perfectly crafted of e-services will fail. Bangladesh should launch targeted programs to provide women, youth and people with disabilities with the drivers needed for digital public services to work for them. This includes integrating digital literacy into community programs, job training centers and school curriculum. At Union Digital Centers, there could be "learn-to-earn" workshops in which citizens are taught how to access online services and apply for jobs or start digital businesses. Ongoing professional development programs, like micro-credentials for front-line service officers, would also ensure continual responsiveness and quality among government employees. ICT graduates could bring in new skills to government and help innovate as paid interns at district and upazila offices. Bangladesh has the potential to develop an e-governance enabled population, involved in and with gains due to e-governance though fostering human capital as well digital infrastructure.

A clear legal balance between innovation, speech, and security

While Bangladesh's cyber laws may help improve security, they have also raised concerns about innovation and freedom of speech. An effective legal system needs to protect critical infrastructure, prevent cybercrime and safeguard citizens' rights. To achieve this, existing laws should be periodically reviewed and subject to broad-based consultations with stakeholders in order to ensure that they are fair, transparent and adhere with international human rights standards. A safe harbor would enable compliant test drives of new technology like blockchain in government, artificial intelligence and the Internet of Things (IoT) without fear of being punished. Start-ups and ministries might also partner up to hit audiences with creative responses to public service problems through regulatory sandboxes. By striking the right balance, and reaching equilibrium across these competing interests, Bangladesh can also protect democratic freedoms, national security and advances in technological innovation within transparent and accountable legal limits. "By striking the right balance, Bangladesh can protect democratic freedoms and national security while fostering an environment where technology innovations flourish under clear, responsible legal frameworks.

Boost the system for grievance redress (GRS)

To complete the feedback loop between citizens and government, a well- functioning grievance redress system is needed. All e-services should be supported by a single Omni Channel GRS accessible over Internet, mob apps, USSD and hotline in Bangladesh. Assuming these are in past-due sick and automating escalation, complaints need to be classified, tracked and resolved according to sizeable SLA's. The clearance rate of grievances at each ministry, along with satisfaction ratings and average resolution times, should be released every month as part of its commitment to transparency. If the GRS and National Portal were integrated, citizens could more easily register their complaints directly from the service page they were on. For rural people without internet, the Union Digital Centers might serve as sites where they could lodge complaints. A robust GRS which helps to solve individual problems and provide useful data that can be used to identify systemic patterns helps government in ensuring the ongoing improvement of services and in building public trust.

Open data for reuse and transparency

Open government data could stimulate significant economic growth, innovation and transparency. For non-sensitive datasets like budgets, procurement records, performance metrics of services and anonymized population data, Bangladesh should adopt a "default-open" policy. These data sets should be published to a national open data portal in machine readable formats with clear and open licenses. (Some businesses, academics and community organizations could find ways to create apps and analyses with public data through APIs. Regular updates and quality control are essential for keeping datasets accurate and reliable. It should integrate open data initiatives into the Right to Information (RTI) framework, where no formal request is needed and information is available easily. Open data can be an engine for accountability, citizen empowerment and GovTech entrepreneurialism in Bangladesh thus opening disincentives to the poor use of citizens' taxes through innovative solutions.

VII. Summery Of Findings And Conclusion

Summary of findings

The study concluded that Bangladesh has taken an appreciable approach towards e-governance transforming service delivery, transparency and minimizing administrative wrangles through remarkable efforts such as National Web Portal, Union Digital Centers (UDCs), e-Filing (Nothi), e-Passport, e-Government Procurement (e-GP) etc under the vision of digital Bangladesh. The e-Government Master Plan, and the National ICT Policy 2018 are illustrative policy frameworks that have provided strategic direction, aligning international leading practices with national transformational aspirations. The foundation of the integrated secure public services has been prepared through infrastructure development (Infrastructures like GovNet -Government

Network, National Data Center and Bangladesh National Digital Architecture (BNDA) have called to initiate). It has played a crucial role in mitigating the rural and urban divide, by ensuring access to digital content even at the remote corners of country.

Nevertheless, the report identifies persistent hindrances to realizing the full potential of e-governance. Lack of monitoring mechanisms and bureaucratic sluggishness results in poor policy implementation, low level of digital literacy among the rural populace, and unequal ICT access in remote localities. The absence of robust data privacy regulations, and cyber-security risks remain huge vulnerabilities that can undermine public faith in digital governance. Moreover, with the proliferation of online service provision, there is on the other hand little citizen's engagement in online forums for decision-making and e-decision making mechanisms are still in their infancy. Owing to affordability, access and awareness challenges, disadvantaged communities are often not able to make the most of e-services, resulting in a digital divide.

Bangladesh needs to roll out more integrated platforms, strengthen interoperability standards, the best practices from its e-governance peers such as South Korea and Denmark state in a comparative study. Share on Facebook Share on Twitter The report further said that "ongoing capacity building for public officials [should be] institutionalized. The research also highlights how emerging technologies like cloud-based services, blockchain, and artificial intelligence have enormous untapped potential to improve service security, transparency and efficiency. In sum, while the e-governance fundamentals in Bangladesh are strong, further progress will require targeted investments in rural connectivity and digital literacy programmes as well as better statutory protections around data and greater interministerial coordination.

For a citizen-**centered**, transparent and accountable digital Bangladesh, the long-term aspiration cannot be just effective but equitable governance-the most important sustainable governance has never been an inclusive or secure collaboration in Bangladesh. The only way to accomplish this is through well thought out policy changes, universal service design and higher citizen involvement.

Conclusion

The initiation of e-governance in Bangladesh represents a paradigm shift in public service delivery (PSD). The government's determination to utilize ICT in the governance that flows from the vision of "Digital Bangladesh" provided enormous benefits in terms of accessibility, efficiency and transparency. With reduced bureaucratic delays, curbed corruption and being able to access services from anywhere, projects such as the Union Digital Centers, e-filing systems, e-passports and electronic Government procurement platform have completely revolutionized service delivery. These policies have also served broader socioeconomic ends by boosting corporate competition, promoting innovation and increasing citizen participation in governance.

The National ICT Policy 2018 and other similar strategic frameworks are a strong foundation for e-governance in policy terms. These policies set ambitious goals for greater transparency, reduced poverty, inclusive growth and a talented digital workforce. To avoid this risk that the digital surge in Bangladesh represents nothing more than a development placebo, it puts itself on track to leverage the digital revolution as an agent of just and equitable social growth by linking e-governance with SDGs. Besides, the government's thrust on physical infrastructure ensures that the building blocks for e-governance also continue to be strengthened. This encompasses shared service platforms, secure networks, and a national data center.

But the progress made so far needs to be understood in light of persistent challenges. However, the scope of e-services is still limited by uneven Internet access, particularly in remote areas. It is, however, mostly the disadvantaged who are left behind in terms of digital literacy through the switchover to digital. Threats to Cybersecurity, lack of adequate data protection laws and privacy issues are some other critical issues that need immediate attention. Moreover, fragmented collaboration between different government organizations may lead to services not being as well integrated and therefore may weaken the overall impact of e-government initiatives.

Bangladesh has various options to explore to make e-government successful. Urban-rural divide closing the digital First, to remoteness bridge of the digital this requires specific investment in ICT infrastructure and connectivity 1. Second, for citizens to gain hands-on experience in using e-services efficiently, the implementation of a widespread digital literacy programed is necessary. Third, strengthening the legal and regulatory model will contribute to building public trust and protecting against new challenges, such as in the areas of data privacy, cybersecurity and interoperability. Fourth, better integration and responsiveness to service needs will be achieved through institutional reform designed to promote interagency collaboration and break down bureaucratic silos.

E-Governance Do Bangladeshi Bangladesh to adopt a variety of strategies with respect to e-governance if it is ever going to realize its full potential. First, in order to narrow the digital gap between city and rural area, it requires investments in ITC infrastructure and connectivity. Two, in order for the citizens to actually use e-Services effectively widespread digital literacy campaigns should be implemented. Third, designing a more conducive legal and regulatory environment will build public trust and protect against emerging threats such as

data privacy, cybersecurity, and interoperability. Fourth, we can enhance service integration and responsiveness through institutional reforms that deepen interagency cooperation and dismantle bureaucratic silos.

In conclusion, e-governance in Bangladesh has already demonstrated that it can enable the public sector to be more transparent, efficient and people-oriented. If the political will is there, if sufficient investment and equitable policies are pursued, Bangladesh has a significant opportunity to lead among developing states when it comes to digital governance although of course there remains much work to be done. The success story of e-governance (whether or not it substantially enhances quality of life for all to the fullest extent) will be the extent to which no one is left behind everyone in common digital awakening!

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