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RESEARCH ARTICLE

Unveiling the Impact of E-Governance on the Transformation from Digital to Smart Bangladesh

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ARTICLE INFO	ABSTRACT
Received: Apr 24, 2024 Accepted: Aug 31, 2024	E-governance has become as a crucial dimension of contemporary public administration in delivering government services to citizens electronically with the aid of information and communication technology. It also increases the efficiency of the management, by improving the citizens' democracy and participation regarding other impactful topics in governance. By adopting a systematic review approach, the researcher utilizes secondary data from more than 150 available sources, comprising literature, policy documents, case studies, and other relevant literature. In this report 70 research papers published between the years 2015 and 2024 were used to provide updated information to the readers. The researchers analyzed the current status, prospects, and challenges of e-governance in Bangladesh under the vision of 'Digital Bangladesh'. E-governance intends to form a technically progressive nation with technologically effective, efficient, and social economic services providing transparency of process with the help of ICT integration. The research findings reveal that obstacles like the digital divide, infrastructure gaps, digital literacy, data privacy, resistance to change, and regulatory constraints deter the implementation of e-governance. However, this paper contributes to the existing literature with the identification of how e-governance should be governed for the sake of development in Bangladesh. The analysis calls for many comprehensive policy reforms, enhanced cyber security measures, capacity building, and bridging of the digital divide. It will then be much easier to realize the dream of a fully digital Bangladesh and facilitate economic growth, innovations, and the improvement of public service delivery.
Keywords	
E-Governance	
Digital Bangladesh	
Smart Bangladesh	
Opportunities	
Challenges	
Socio-Economic Impact	
Systematic Review	
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INTRODUCTION

The provision of governmental services through the utilization of information and communication technology (ICT) is discussed to as e-governance (Derindag et al.,2019). It is the key to modernizing government and making services more efficient. As countries are looking to improve their administration and citizen engagement, e-governance is the key to transparency, efficiency, and participation (Derindag et al., 2019). Nowadays, countries around the world are trying to improve their administration and citizen engagement. In this case, e-governance is the key to transparent, efficient, and participatory governance (Islam & Bhuiyan, 2022). Bangladesh, like many developing

countries, has realized the potential of e-governance to achieve its development goals. The government's vision of "digital Bangladesh" is proof of its commitment to harnessing digital technologies for overall socio-economic development (Hossain et al., 2021). This vision is to create a digitally empowered society where governance is not only more accessible but also more efficient and transparent. Bangladesh has made significant strides in its e-governance journey. Digital Bangladesh Vision 2021 has set the base for e-governance in different sectors. All of these are meant to enhance general governance, accountability, and public service (Bhuiyan et al., 2024; Rahman et al., 2024).

"Digital Bangladesh" policy aims to create a contemporary nation with continual access to ICT, including the e-commerce (Khanom et al., 2022), Internet, e-governance, e-banking, well-networked software, open-source software, and reliable power sources (Mazumdar & Alharahsheh, 2020). According to Hossain et al. (2021), Bangladesh is making significant strides towards digitalization by prioritizing the utilization of limited resources and infrastructure, which is in line with the advancements of the fourth industrial revolution. It facilitates a substantial digital and socio-economic transformation in the country (Bhuiyan et al., 2024).

Smart Bangladesh might be able to make people's lives better by solving problems related to growth, like traffic jams, air pollution, and trash collection. Panel (2023) says that it can also make cities smarter and more sustainable, encourage the use of renewable energy and better waste management, improve access to good education and health care, push for efficient and open government, and encourage new ideas and business, all of which can create jobs and boost the economy (Mani, 2019, 2024).

Bangladesh is actively striving to accomplish the goal of becoming a smart country. It will transform into a Smart Bangladesh by 2041 by focusing on supply chain management, voting systems, and healthcare in general and using the potential of Blockchain (Bhuiyan & Akter, 2024). Bangladesh is making progress towards the goal of a 'Smart Bangladesh,' based on the vision of 'Digital Bangladesh' outlined in Vision 2021 (Talukdar et al., 2024). By depending on four pillars (smart economy, smart government, smart society, and smart citizen) Bangladesh is striving to realize the 2041 vision (Roy, 2022). In addition to the 2041 vision, the government has developed the Delta Plan 2100 in order to provide an overview of the course that the country would take throughout its development (Roy, 2022). As Bangladesh moves further on its journey toward becoming a smart nation, the success of this nation may be attributed to the improved functioning of its electronic government system. According to Ahmed et al. (2023) the aim of digital Bangladesh is to achieve adoption of digital technology, knowledge based society, innovative entrepreneurship, digital infrastructure and human resources.

Research Gap

Though the use of ICT makes the electronic governance system more accessible to the general public (Derindag et al., 2019) but the path of proper implementation of e-governance system for achieving better administration is quite challenging (Bhuiyan, 2011). Different Issues like the digital divide, technological infrastructure gaps, digital literacy challenges, data privacy concerns, resistance to change from traditional practices, and regulatory and policy constraints significantly affect the implementation and effectiveness of e governance system (Rahman, 2016). As the goal of digital to smart Bangladesh can only be attained with the help of e-governance (Bhuiyan et al., 2024). So, this review delves deeply into the progress, setbacks, and necessary steps for Bangladesh to achieve its goal of a smart Bangladesh through the use of digital tools to operate its government. By mixing what is already known and spotting what is missing, this paper aims to add to the talk about making e-governance better to help the country grow.

Objective of the Study

The primary objective of this study is to examine the progress, challenges, and prospects of e-governance in Bangladesh within the context of the "Digital Bangladesh" vision. Specifically, the study aims to:

R01: To examine the present Status of E-Governance in Digital Bangladesh.

R02: To identify the significant challenges that hinders the successful implementation of e-governance.

R0 3: To evaluate the socio-economic impact of e-governance on building up smart Bangladesh.

LITERATURE REVIEW

In the development of "digital Bangladesh" and the quickly changing digital environment, e-governance has become an important aspect. E-governance refers to the implementation of specific methods and strategies that aim to enhance the efficacy and efficiency of public administration via the use of Information and Communication Technology (ICT) (Uddin, 2012).

E-government integrates digital communities with extensive documentation. For secure and prosperous e-governance, it is necessary to ensure information security and authorized access for particular communities (Bhuiyan et al., 2024). Yumame (2024) highlighted the advantage of e-governance in promoting adequate information security, mainly through the provision of interactive online services. Their study focuses on cloud computing, which provides cost-effective and standardized e-government solutions that may enhance business services and benefit citizens. Besides the scalability, reliability, performance, and cost-effectiveness of e-governance, Dash & Pani (2016) highlight the difficulties, particularly the security and protection concerns that arise for both the government and citizens. The challenges and Opportunities of E-Governance in Bangladesh are simply described by Sarker et al. (2019). The study emphasizes the importance of information resource management in developing proper e-governance in Bangladesh. In his study, Bhuiyan (2011) explains how the government uses ICT to improve service delivery and transparency, which could aid in the fight against poverty and corruption.

Digital Bangladesh

"Digital Bangladesh," is turning into a highly relevant daily conversation subject among Bangladeshi IT experts, reporters, legislators, students, and policy officials (Islam, 2018). Nevertheless, the exact meaning of the "Digital Bangladesh" slogan remains ambiguous to a significant number of individuals in Bangladesh (Genilo et al., 2009). While the government has not provided a complete and official definition of "Digital Bangladesh," various government officials, business leaders, media personalities, academicians, NGO heads, and IT specialists have formulated their interpretations of the term (Habib & Faysal, 2009). A few explanations of "Digital Bangladesh" are provided in (table - 1) below.

Table-1: Prospective Applications of Digital Bangladesh

Sectors	Prospective Applications
Government	In the vision of "Digital Bangladesh," citizens can access information through electronic channels. Government services can be efficiently delivered through electronic channels, reducing the necessity for extensive human interaction. Applying the latest advancements in science and technology in the country is of the utmost importance.
Business	Bangladesh can compete on a world level by using digital technology to build a fundamental knowledge economy.

Academe	The idea behind "Digital Bangladesh" is that it will help fix many of the issues that the country is facing, like poverty, unemployment, ignorance, and corruption.
IT Specialists	The incorporation of Information and Communication Technologies (ICTs) into social and economic activity. The vision is to establish a prosperous and enlightened Bangladesh devoid of poverty and hunger, where all individuals have equal rights. However, this will be propelled by digital technology.
Media	Technology will be used to process all government, semi-government, and Commercial sector tasks. The focus is on technology, including IT and modernization.
Civil Society	A desire to connect rich and poor, urban and rural. In a poverty-free Bangladesh, individuals can use their rights, utilize knowledge, and fulfill their desires.

Source: (Genilo et al., 2009)

Besides these applications, Khan (2018) explains how Bangladesh's economic and social systems are crucial to the country's digital transformation. Aziz (2020) discusses the effectiveness of Bangladesh's National Information and Communications Technology Policy (NIP) in achieving digital inclusion. His study emphasizes how a techno-centric skill-based approach helps the government to achieve digitalization. However, there is still the problem of the digital divide concerning the equitable gain of technology, which, in fact, reaches the lowest rungs of the constituency. There are also other challenges with infrastructure limitations (Khan, 2018). Addressing these is going to be very important in fully realizing the NIP and comprehensively achieving digital inclusion.

Smart Bangladesh

According to Anthopoulos & Reddick (2016), Smart government refers to the adoption of a series of business procedures that utilize information and communication technology (ICT) to facilitate the exchange of information across different government entities and ensure the delivery of high-quality services. In broadly, Smart government refers to the use of intelligently networked information and communication technologies (ICT) to efficiently and effectively manage governance and administration at various levels, including the neighborhood, civil, territorial, state, national, supranational, and worldwide levels, which aims to enhance the performance of public tasks (von Lucke, 2015). It plays a crucial role in society by strategically contributing to the development of managerial capacities, which ultimately improves overall effectiveness (Kliksberg, 2000). Competent government might be established through cross-agency working groups in various ICT

fields, the development of infrastructure for educational training, and the implementation of effective procurement methods (Yumame, 2024).

Digital to Smart Bangladesh

The primary advantages of Digital Bangladesh encompass enhanced efficacy, openness, and responsibility in governance, along with enhanced accessibility to services and information for residents, heightened productivity and efficiency across multiple sectors, digital entrepreneurship, encouragement of e-commerce and the generation of employment prospects in the ICT sector (Panel, 2023). It might also lead to the growth of a digital economy that can create opportunities and boost the economy. By effectively leveraging e-governance and enhancing the country's economic standing, Bangladesh could potentially attain the objective of becoming a smart nation (Ahmed et al., 2023).

Although several studies have been conducted on e-governance, its challenges and prospects in the contemporary world, e-governance practices in Bangladesh, and the prospective of digital Bangladesh, there is a lack of comprehensive works that consolidate all the relevant papers to facilitate future research on e-governance for a technologically advanced Bangladesh.

METHODOLOGY

The use of qualitative research methodologies was given considerable weight throughout this paper. Systematic investigation (Dabić et al., 2020) helped to guide the choice of this research strategy. This methodology involves doing a comprehensive examination and analysis of all relevant literature pertaining to a specific research question, subject area, or intriguing phenomenon. From the perspective of Bangladesh, the collection of primary data is not practicable because various sectors of this country are still in the process of development. So, to explore this review, researchers use secondary data such as extant literature, policy papers, case studies, and other relevant information collected from appropriate sources (like Bangladesh Economic Review, Bangladesh Bureau of Investigation, a2i, IGI Global, etc.) and various related journals. In order to carry out this research, more than 150 articles were collected, and as a result, a substantial amount of information was retrieved from those publications. A number of phrases, including "e-governance," "digital transformation,"

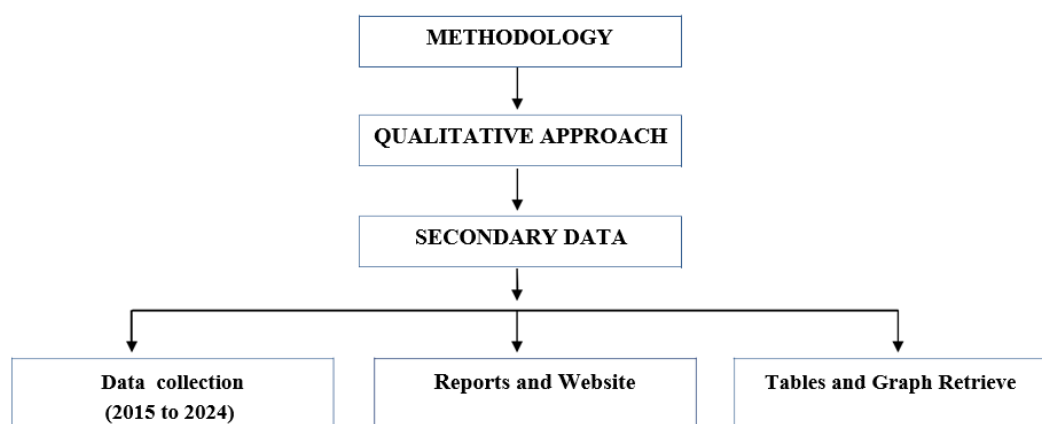


Figure 1: Research Methodology

Source: Author's Work

ANALYSIS AND DISCUSSION

E-governance is enhancing the social and cultural infrastructure. As the Effective utilization of e-governance system is essential for achieving the objective of a technologically advanced Bangladesh (Bhuiyan et al., 2024). So it is essential to comprehend the viewpoint, assessment, and overall operation of the e-government system. The following discussion offers:

E-Governance: Concept and Global Perspective

E-Governance is the use of ICT to enhance service delivery in a responsive, accurate and transparent manner while meeting the SMART goals of an administration focused on the citizens (Singh, 2023). The effective elements of smart e-governance include artificial intelligence, machine learning, and data analytics for the improvement of public service, citizens' engagement, and government openness, as illustrated in success stories of Estonia and Singapore (Pani & Mourya, 2023).

Evolution of E-Governance in Bangladesh

Bangladesh got global attention for its independence movement in the early 1970s, and even after winning independence, the country faced huge post-war problems, infrastructure destruction, and a change of government (Van Schendel, 2020). Since that time, it has emerged as one of the fastest-growing nations globally, especially in South Asia. The declaration of 'Digital Bangladesh' in the year 2009 can be considered as the launch of the Bangladesh into the regime of e-governance. The vision for this goal was therefore to use ICT in improving the governance and service delivery in the levels of government. (Hossain, 2022)

Currently, Bangladesh has accomplished its goal of "Vision 2021," which is commonly referred to as the vision of a digital Bangladesh (Mazumdar & Alharahsheh, 2020). The term "Digital Bangladesh" pertains to the contemporary concept of utilizing and implementing advanced technologies, including Cloud Computing, rather than merely the more extensive use of computers (Habib & Baizid, 2010). The objective of the "Digital Bangladesh" initiative is to develop the necessary skills to effectively compete in the 21st century of globalization using cost-effective delivery systems and digital learning environments (Mazumdar & Alharahsheh, 2020). According to The Access to Information (A2i) Program (2016), the idea of "Digital Bangladesh" is based on four things: developing human resources, connecting citizens, digital government, and using ICT in business (Bhuiyan et al., 2024). In order to establish a digital Bangladesh, it is crucial to focus on four key pillars that will facilitate the government's authority through online platforms and promote the growth of e-governance.

Human Resources Development in Bangladesh

Bangladesh has a large number of populations. There are about 174 million people live in Bangladesh (Worldometer (n.d.)). By developing the population into human resources it is possible to expand the economic situation of this country (Karim et al., 2024). The support of Government in online education and vocational training is essential to develop a workforce that helps to meet the demands of a rapidly evolving job market (Alam et al., 2024). Furthermore, high-quality healthcare and better social services could enhance overall productivity of the country (Ahmed et al., 2020). According to the Bangladesh Economic Review (2024), Bangladesh has ranked 129th globally in terms of the human development index. The people of Bangladesh are the country's most valuable asset, and the government is actively working to cultivate this asset by investing in a wide range of educational initiatives, healthcare improvements, and technology advancements to ensure sustainable economic growth that helps to achieve digital Bangladesh.

Education and Training

The foundation of a nation is its educational system (Mduwile & Goswami, 2024). Education and training are crucial components of e-governance initiatives. The government knows that the dream of a digital Bangladesh will only come true if all people can get the proper education, use the internet, and have access to suitable digital infrastructure. Bangladesh government allotted BDT 94,711 crore for the education area in FY2025, representing a modest 7% increase compared to the proposed budget of last year of BDT 88,162 crore (Ministry of Finance, 2024).

Furthermore, recognizing the crucial importance of ICT in education, Bangladesh has established a strategic plan called "Vision 21" to enhance the standard of education by incorporating ICT into its educational framework (Khan et al., 2012). Considering this, the Bangladesh government has undertaken several measures to integrate ICT into classroom instruction in order to promote the

desired transformations. Secondary schools in Bangladesh are now required to implement information and communication technology (ICT) in their classroom instruction (Ministry of Education (MoE) Bangladesh, 2021). During COVID-19, the online education system assists a large number of students in their knowledge deficiencies (Sohel et al., 2024). Bangladesh enforced an extensive and enduring school closure during the pandemic, which lasted for more than 18 months, and the government has implemented a range of learning interventions to support children. These interventions include non-interactive, interactive, and hybrid approaches (Hossain & Wahedur Rahman, 2022).

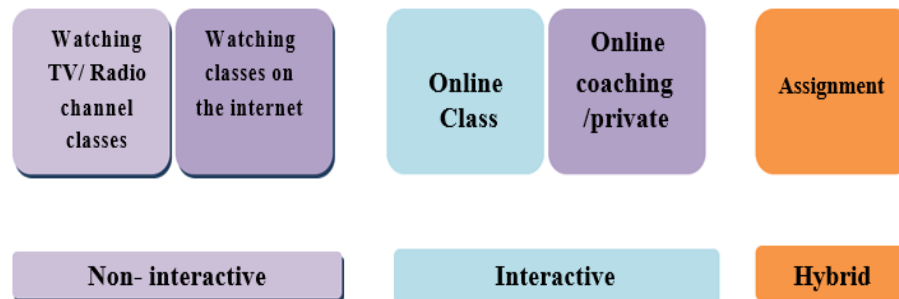


Figure 2: Usages of ICT in Education and Training

Sources: Hossain and Wahedur Rahman, (2022)

Digital Government

The government is just one of the many facets of life that digital technologies have significantly impacted. The government system is using digital technology to increase transparency, efficiency, and citizen service (Yumame, 2024). Governments utilize digitalents utilizer public services more quickly and conveniently. This covers paying taxes, registering for social services, and storing and retrieving papers, among other things (Castro et al., C. 2022). Through the utilization of big data and analytics, governments might effectively handle and examine vast quantities of data with improved efficiency. This might be facilitating evidence-based policy formulation and assures optimal allocation of resources.

The government improves its digital platforms to encourage more public engagement and build cyber security measures to safeguard individual information and the integrity of democracies from cyber threats (Zhao et al., 2015). Its vision is to put Bangladesh in the top 50 in most Cybersecurity nations by 2040 (Bangladesh Cyber Security). The government provides national hotline #333 to serve health assistance to the people, a toll-free helpline that received over 14 million people during COVID-19 through ShasthyoBatayon #16263 and

Bangladesh Child Helpline #1096 by which the government provides parental guidance on how to support children during the lockdown (Chowdhury & Hossain, 2023). At the Upazila (sub-national) level Union Digital Centres, the "TotthoApa" project taught and educated young women to directly reach and empower rural women with digital literacy programs and health services (Khene& Hernandez, 2024). The implementation of mobile money payments for social protection was a bold and high-priority initiative for Digital Bangladesh (Siddiquee et al., 2022).

ICT in Business

As new technologies emerge, companies are embracing them to boost their sustainability by becoming more competitive, profitable, efficient, and effective through the provision of personalized products (Arefin & Rahman, 2020). The government understands the necessity of incorporating technology into the business process in order to establish a digital Bangladesh. So, the government has launched various initiatives to promote ICT adoption across industries, including improving digital infrastructure, offering training programs, and providing financial incentives for technology investments (Andrews et al., 2018). Additionally, 8,000km of optical fiber cable has been installed throughout the country, and a second submarine cable has been installed in Kuakata, which will

provide Bangladesh with a 1,500GB/s bandwidth (Islam, 2018). At present, more than 35,000 individuals and 25,000 small and medium enterprises are part of the government's digital entrepreneur project (a2i, 2022). To develop an efficient ecosystem in the e-commerce industry, the Bangladesh government integrated and assisted the e-commerce platform "ekshop". For the people of the rural areas, "workshop" is the first online shopping project initiative by the Bangladeshi government (a2i, 2022). From the Ministry of Commerce and Trade, digital commerce cell, e-banjo project to build connectivity among the division and the development of e-commerce website plays a greater role in implementing a digital Bangladesh with good governance (a2i, 2022).

Current State of E-Governance in Bangladesh Digital Service Delivery

Significant progresses in digital service delivery through ingenuities like the Union Digital Centers (UDCs), various mobile applications, and National Portal have been made by Bangladesh (a2i, 2022). To create public services more accessible to citizens, these platforms offer various services, including birth registration, utility bill payments, land records etc.

Infrastructure Development

Bangladeshi government has capitalized profoundly in digital infrastructure, including intensifying broadband connectivity, establishing data centers, and implementing cloud computing solutions (Karim, 2015). Over 8,000 km of optical fiber and SEA-ME-WE 5 (a second submarine cable) installation has enriched connectivity, essential for supporting e-governance initiatives.

Capacity Building and Digital Literacy

Exertions to construct digital literacy and capacity among government officials and citizens are ongoing. Educational initiatives, Workshops, and training programs aim to prepare individuals with the needed skills to utilize digital services successfully (Ahmad, 2021).

E-Governance for Smart Bangladesh

To form a technologically progressive, comprehensive, and sustainable society by 2041 "Smart Bangladesh" constructs on the grounds of Digital Bangladesh. Smart Bangladesh (Vision 2041) incorporates four pillars: Smart Citizens, Smart Government, Smart Economy, and Smart Society.

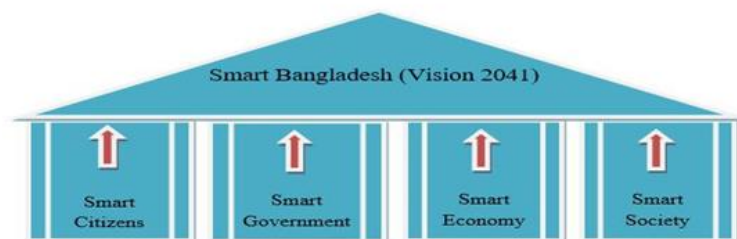


Figure 3: Four pillar of smart Bangladesh (Source: Authors 'contribution)

This vision places a robust importance on e-government, which underlines improved citizen participation, digital service delivery and effective public administration (Bangladesh Planning Commission, 2023).

Smart Bangladesh

Bangladesh is an emerging country in South Asia (Husain & Tinker, 2020) that has demonstrated consistent growth and progress (Akter & Ahmed, 2022). The government is known for its ability to recover quickly and achieve rapid development and has embarked on a transformative journey to become "Smart Bangladesh" (Ahmed et al., 2023). Through the successful implementation of Bangladesh's advanced technology-driven development "Vision 2021" (Talukdar et al., 2024), the motto of smart Bangladesh, "Vision 2041," was derived. The country has made significant progress in all sectors by utilizing ICT and through the proactive leadership of the current government (Ahmed, 2023). According to Ashraf et al. (2019), Bangladesh has accomplished several goals: the reduction of extreme poverty, the guarantee of food security to individuals, the decrease in mortality

rates, the improvement of primary education for all, and the control of infectious diseases (Kaium et al., 2019).

Bangladesh is now working towards the Millennium Development Goals (MDGs), which are intended to help the country move closer to the line of developing countries. Overall, it can be said that Bangladesh has made significant strides in achieving the goal of digital Bangladesh by 2021. Bangladesh transitioned from being a less-developed country to a lower-middle-income country in 2015 (CRI, 2023). Additionally, the nation has accomplished noteworthy achievements, including the successful launch of its first satellite, Bangabandhu-1 (Islam, 2018). It undertakes the development of infrastructure like the

Bangabandhu Tunnel, Padma Multipurpose Bridge, Metro Rail, and Ruppur Nuclear Power Plant (Mirza, 2022). Uddin (2015) indicates that the Gross Domestic Product (GDP) has shown signs of progress, with an increase from 4% in 1972 to 18% in 2019. The education sector has also seen improvement, as seen by the rise in the country's literacy rate to 74.7% (Shayery et al., 2022).

Additionally, there has been progress in ensuring food security (CRI, 2023), and so on. Bangladesh is currently prioritizing the attainment of the Sustainable Development Goals (SDGs), the Perspective Plan-2041, the Delta Plan-2100, and the goal of achieving a technologically advanced Smart Bangladesh (Alam, 2019).

Bangladesh Government first talked about the idea of a "smart Bangladesh" on December 12, 2022 (Ahmed et al., 2023). According to Kabir (2023), the concept of smart Bangladesh has grown around four main ideas: "Smart Citizen," "Smart Government," "Smart Society," and "Smart Economy."

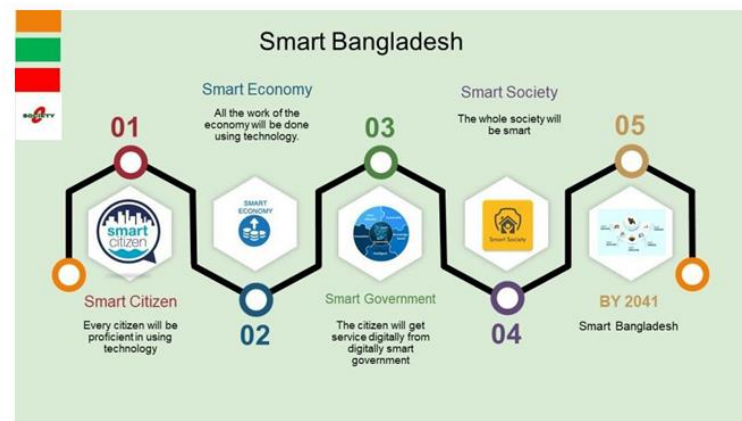


Figure 4: Four pillars of Smart Bangladesh

Source: (Roy, 2022)

Smart Citizen

Smart citizens are individuals who utilize technology to engage with a Smart City ecosystem (Priom et al., 2024), address local issues, and actively contribute to the decision-making process (IGI Global, 2022). Smart Citizenship empowers individuals with the necessary skills and resources to promote citizen engagement in data gathering, analysis, and action (Smart Citizen, 2022). To be a smart citizen, persons have to make use of all the services that have been improved by technological, social, and cultural elements (Bayar, 2017; Bhuiyan, 2024)). In countries like Bangladesh, e-government services are provided to rural areas as notable progressions that offer convenient access for residents, provide benefits, and enhance transactions related to government-to-citizen interactions (Bhuiyan, 2011). People can easily adapt with services like, including citizen certificates, and citizen charters (Hoque and Sorwar, 2015). By taking governmental initiative, now about 97.9% of people are mobile phone users in Bangladesh (BBS, 2024). According to the Association of Mobile Telecom operator of Bangladesh (2024), at the end of April 2024, the total number of Internet subscribers reached 138.59 million. People are now emphasizing higher education, different skills, the ability to networking, social interaction, participation in the building of the smart city, trust, and relationship building that helps to grow as smart people (Budhai & Proag, 2015).



Smart Economy

A smart economy is founded upon technological advancement, novel entrepreneurial endeavors, sustainability, and innovation aimed at enhancing social welfare, resource efficiency, productivity, and competitiveness that entails minimizing energy consumption and enhancing the overall quality of life (IGI Global, 2022). The concept of the smart economy encompasses digital payment technologies that enhance productivity, revolutionize the business landscape, generate promising prospects for achievement, strengthen the functioning of communities (Bhuiyan, 2019, 2023), and facilitate the development of larger and more secure smart cities. The concept of the "Smart Economy" integrates various aspects of the modern economy with a forward-thinking, sustainable, and environmentally conscious approach (Apostol et al., 2015).

Furthermore, a smart economy promotes the development of new ideas and originality in conjunction with scientific investigation, advanced technology, and the preservation of the environment by implementing sustainable practices. These principles have advantageous effects on both present and future economies (Kézai et al., 2020).

By improving the technological infrastructure, modernizing industries, expanding the ICT sector, and fostering the growth of the startup ecosystem, Bangladesh hopes to realize its vision of a smart economy (Parikshit, 2024). Information and communication technology is going to be a major source of income for Bangladesh by the year 2041. Experts predict that the ICT sector would have grown to \$50 billion, with at least 50 unicorn firms establishing themselves as industry leaders in Bangladesh (Rashad, 2023). The journey towards the future is being propelled by economic and political stability. Although it is currently the 41st largest economy, it will be the 25th largest economy by 2035 (BIDA, 2024). Bangladesh's GDP has shown notable growth over the past decade and currently stands at 7.50%. From 2019 to 2027, the overall GDP growth, inflation rate, and investment rate are given below, from which it can easily be understood that Bangladesh has experienced significant growth over the past decade and is growing to next Asian Tiger (BIDA, 2024).

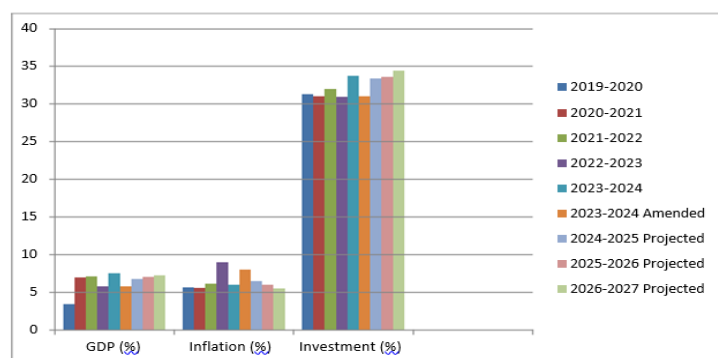


Figure 5: GDP, Inflation and Investment (2019- Predicted 2027)

Source: Bangladesh Economic Review, (2024)

The bar chart provides a comprehensive comparison of GDP, inflation, and investment in percentage, including both actual data and projected forecasts. Bangladesh's GDP has a notable level of stability with little fluctuations. The government effectively manages inflation within a consistent range, and there has been a steady increase in overall investment in recent years (Bhuiyan, 2019, 2019, 2023, 2024). In general, Bangladesh is experiencing significant growth towards becoming a SMART Bangladesh by developing its Gross Domestic Product (GDP), controlling inflation, and increasing investment (Milon et al., 2024).

Smart Government

Smart governance encompasses elements of political engagement, the provision of services to citizens, and the efficiency of administrative processes (von Lucke, 2015). To be smart governance, some fundamental features must be present.

Table 2: Feature of smart governance

No	Feature	Description
1	e-Administration	Engagement of individuals and institutions through the utilization of electronic means.
2	e-Participation	Collaborative citizen participation via electronic means for the enhancement of the city
3	Digital citizen	Technologies that are accessible and inexpensive are given to the public, and they receive training on how to use them effectively.

No	Feature	Description
1	e-Administration	Engagement of individuals and institutions through the utilization of electronic means.
2	e-Participation	Collaborative citizen participation via electronic means for the enhancement of the city
3	Digital citizen	Technologies that are accessible and inexpensive are given to the public, and they receive training on how to use them effectively.
4	Digital Business	Technologies are utilized to connect businesses with one another, particularly when they are involved in linked supply chains and need a safe platform to exchange data (Kondepudi, 2014).
5	Online public Services	The introduction of new technologies improves the delivery of standard services. The cost of doing transactions is lower for citizens in welfare states. For instance, a few municipal councils proposed allowing residents to sign documents electronically for specific municipal processes, which would cut down on the expense of having to travel to complete tasks.

6	Transparent Governance	Information dissemination through public media and networks to raise citizen awareness is important in smart cities because informed citizens who can make good decisions for the betterment of society are needed (CVNC, 2013).

Source: Adapted from Kondepudi, (2014)

Bangladesh's government has undertaken initiatives to promote smart citizens and smart governance (Pal & Sarker, 2023). The Digital Service Design Lab expedites the process of digitizing government services by examining manual processes, creating digital alternatives, developing financial plans implementation strategies, and collaborating with relevant parties (Faraji et al. 2024; Rahman et al., 2024). Some of the outstanding achievements of the Bangladeshi government in the last year include the electronic filing system, digital healthcare, digital land management system, national ID card conversion to a smart card, and union digital center (a2i, 2022). Day to day, it goes toward the path of smart Bangladesh (Masum et al., 2024).

Smart Society

According to Ahmed et al. (2023), Promoting awareness and increased citizen engagement, Enhancing people's well-being, Encouraging the adoption of digital tolerance, cultivating a thriving and inclusive society, and Having strong ethics and values is a clear sign of a smart society (Bhuiyan et al., 2024). Bangladesh tries to develop its society into a smart society by taking various initiatives. For example, EkShop aims to provide support to rural youth, artisans, and farmers by offering digital livelihood opportunities (a2i, 2022). Through this program, it empowers individuals to impact on their lives and contribute to overall well-being (Hossen, 2024). People get the products at a fair price with 24-hour accessibility and can make payments digitally, which helps to build up an advance society (a2i, 2022). Government handle some of the most pressing social and environmental problems that Bangladesh is facing right now by using new technologies, especially electromechanical gadgets, the Internet of Things (IOT), and green energy (a2i, 2022). Bangladesh's Cottage, Micro, Small, and Medium Enterprises (CMSME) are going digital (Ahmed et al., 2023). This includes digital identity, linked transaction history creditworthiness, awareness and skills, training and development programmes that helps to become more digital (Ahmed et al., 2023). However, with better society, organization and smarter use of technology, Bangladesh is moving closer to becoming a smart country every day (Hossain et al., 2024).

Prospects of E-Governance in Digital Bangladesh

E-governance offers various advantages for Digital Bangladesh, including:

Increased Accessibility: E-governance offer citizens with direct access to government services that were previously inaccessible (Avianto et al., 2022).

Improved Efficiency: By plummeting the need for manual intervention and growing the speed of service delivery E-governance can automate many government services, (Bhuiyan, 2011).

Enhanced Transparency: Citizens can get real-time information on government services through E-governance platform and it can shrink corruption and promote accountability (Ibrahimi et al., 2023).

CHALLENGES

Though e-governance offers numerous benefits, it also comes with several challenges, especially in the context of implementing Digital Bangladesh. Here are some key challenges:

Digital Divide: The lack of digital devices in many rural areas and the lack of digital literacy to use e-government services effectively create challenges for building up digital Bangladesh.

Cyber security: Cyber security vulnerabilities are one of the most severe challenges to Bangladesh's digital transformation aspirations. As we become more reliant on digital technologies and interconnected systems, the potential of cyberattacks, data breaches, and malevolent acts grows (Bhuiyan et al., 2023, 2024). Additionally, there is a risk that user infrastructure can be more susceptible to physical disruptions, either from individuals within the organization or external causes, particularly in less secure office locations. Cyber hazards, including malware, ransomware, phishing, and denial-of-service (DoS) attacks, can damage vital infrastructure, interrupt vital services, steal sensitive data, and erode faith in innovative solutions (Sarker & Khan, 2024).

Data Privacy Concerns:

Data privacy and security are becoming more critical issues due to the accumulation of large volumes of sensitive personal information and the widespread use of data-driven technology. Unauthorized access, misuse, or exploitation of data can result in identity theft, financial fraud, and reputational harm (Poli, 2024).

Inconsistent Power Supply: It is widely acknowledged that Bangladesh has made remarkable advancements in power supply management across the country over the past decade. The force of electricity has illuminated every region in the country. However, because of the impact of the COVID-19 pandemic, Bangladesh is steadily diminishing its ability to deliver a continuous power supply. Specifically, the absence of consistent electrical stability (Akhter & Ahmed, 2022) has resulted in a decline in productivity and universal access to the Internet has only sometimes been guaranteed (Al-Amin, 2022). That could be one of the primary obstacles in attaining smart Bangladesh (Alam et al., 2022).

Lack of Public Awareness: Despite the government's initiation of several ICT integration initiatives, a large number of individuals use mobile internet for limited purposes. The rural region people need more literacy and skills as well as they are less likely to receive assistance or guidance in utilizing digital services to enhance their economic prospects (Kos-Labedowicz, 2017). This could present significant obstacles in realizing the goal of a technologically advanced Bangladesh.

Technological Infrastructure Gaps

Bangladesh faces noteworthy technological infrastructure gaps, containing insufficient internet connectivity, inadequate access to electricity, and scarce data centers (Islam et al., 2023). Potential benefits of digital transformation and the effective implementation of e-governance is obstructed by these infrastructure gaps (Milon, 2024). To overcome these challenges, the Bangladesh government has introduced various projects, such as the National Data Center (NDC), and Bangladesh National Broadband Network (BNBN) to expand technological infrastructure and support e-governance initiatives (a2i, 2022).

Resistance to Change

The execution of e-government is met with opposition from employees because they are reluctant to learn new systems (Elgohary & Abdelazyz, 2020). Developing countries in the context of e-governance must surmount a number of obstacles that include cultural resistance to changes; weak planning for electronic government service provisioning at all levels and appropriate budgeting coupled with a lack of adequate Information and Communication Technology (ICT) infrastructure before embarking on a path that mirrors progressive mechanized administration systems rather than enhancing minimal bureaucratic capabilities (Pangaribuan, 2019).

Regulatory and Policy Constraints

Existing regulatory frameworks might not be supportive of swift adoption and implementation of e-governance. Research shows some sections of governmental “E” policies and legal hindrances to the implementation of e-governance. This lack of clear regulatory frameworks and structural policies prevents optimal implementation capacity for e-government in Indonesia leading to such environmental damages as growth in redound on computer hardware (Firmandayu & Elfaki 2023).

The compliance of the regulatory framework is necessary to counteract policy challenges and guarantee the success of e-governance programs in the establishment of the e-government services (Hasan et. al., 2015).

Many problems are stated to exist when it comes to E-Government implementation in Afghanistan; these include no implementation guidelines, no legal framework, security rules, and political endorsement. The matter is that constant advancement requires a change of policies so that people will get the environment in which they will be encouraged to transform digitally (Ismail et al., 2022).

Socio-Economic Impact of E-Governance

Improved Public Service Delivery

Due to implementation of E-Governance the public service delivery has been made easy hence reducing time noted in bureaucratic efficiencies and making it convenient for the people in figure 6. Therefore, it can be concluded that various online services are becoming available to the population, with no need to go to government structures (Uddin, 2012).



Figure 6: Impact of Digital to Smart Bangladesh Transformation

Enhanced Transparency and Accountability

With the current trend of making things go digital, it has become easier for the government to reduce opportunities for corruption and foster accountability (Hossain et al., 2024). Thus, procurement processes have advanced to a considerable level because of the introduction of E-Government such as the National e-Government Procurement (e-GP) System (Islam, 2018).

Economic Growth and Innovation

The government services have been extended in the digital environment which has a positive impact on creating the business climate and innovation thus contributing to economic development and effectiveness of ICT on business process (Akter et al., 2023). Integration of ICT in business process influenced the business competitiveness and made the opportunities for economic activities in figure 6 (Arefin & Rahman, 2020).

Recommendations for Strengthening E-Governance Bridging the Digital Divide

Sufficient targeted programs must be achieved with a great future that fights against the attribution of fixed broadband internet and digital literacy to the remote area and other parts that are difficult to reach. Invest more in infrastructure development such as; expanding broadband networks and appropriate energy supplies to power the digital integration (Khan, 2018).

Enhancing Cyber Security Measures

Adopt appropriate cyber security policies and frameworks that shall ensure the safety of the citizen's information as well as create credibility in the digital governance systems. To mitigate risks regular monitoring, auditing and updating of security protocols are crucial (Bhuiyan, 2024).

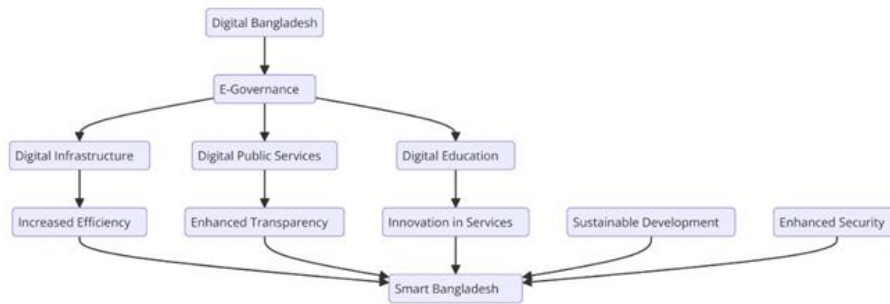


Figure 7: Example of Transforming Digital to Smart Bangladesh

Capacity Building and Change Management

Organizational Capacity Building and Change Management can be done by an awareness creation among the government officials and citizens so that their capacity is built to improve their understanding on how to utilize the e-governance services (Kabir et al., 2024). However, with intervention from the education sector and private sectors this can go a long way in enhancing the skill development initiatives in figure 6 (Khan et al., 2012).

Policy and Regulatory Reforms

Some of the required measures include the improvement of existing policies and regulations to support the forthcoming digital transformation in figure 6. Therefore, the creation of enabling environment for investment and innovation would help in hastening the process of e-governance whereby the usage of ICT in the provision of government services is encouraged, facilitated and enhanced; and bureaucratic hurdles are addressed and minimized (Sarker et al., 2019).

Promoting Public-Private Partnerships

The encouragement of the government-private academia relationship leads to innovation hence the need to advance ICT solutions. This also enhances a sharing of resources; apart from the sharing of best practices which consequently enhances the effectiveness of e-governance systems (BASIS, 2023).

Recommendation

Infrastructure Development in Rural Areas: The government has made investments to construct a resilient digital infrastructure in rural areas and to enhance broadband accessibility by providing inexpensive internet services (Bhuiyan et al., 2024).

Enhancing Cyber Security: Building a robust cyber security framework is essential for Bangladesh to realize its vision of smart Bangladesh (Poli et al., 2024).

User-Centric E-Government Services: To achieve its goal of a smart Bangladesh, the government can provide user-centric electronic services (Bhuiyan et al., 2023, 2024). Effective service not only brings joy to individuals but also facilitates significant enhancement of human resources in figure 6.

CONCLUSION

Bangladesh's journey in the e-governance platform has been praiseworthy thus making the foundation for the Smart Bangladesh vision 2041. Information and communications technologies can be labeled as essential for the internal reform of the public administration and the improvement of governance, services, and citizenship outcomes (Akter et al., 2023). However, there are hurdles such as the digital gap, the deficiency of proper infrastructure, data protection and legal issues which need to be solved so as to make this vision successful. If the targeted strategies are employed and cooperation among the concerned parties is secured in Bangladesh, the challenges can be nullified and a more liberal, efficient and transparent mode of governance can be established (Amin et al., 2024). In order to attain the prepaid socio-economic objectives of the Smart Bangladesh initiative, the sustained intention towards digitalization and investment towards people capital, structures, and protection from cyber threats will be imperative. The transition from Digital Bangladesh to Smart Bangladesh represents a significant advancement in the field of e-governance. By enhancing digital literacy, expanding internet connectivity, and digitizing public services, the initiatives under Digital Bangladesh established a strong foundation (Islam et al., 2024). Adoption in digital technology, the knowledge-based society, innovative entrepreneurship, digital infrastructure, and human resources are the major elements that achieve by Bangladesh as well as recognized as digital Bangladesh. Now through the proper use of smart citizen, smart economy, smart government, smart society, internet penetration, artificial intelligence, and human resources development Bangladesh dream of being a Smart Bangladesh till 2041 (Bhuiyan & Akter, 2024). The progression towards smart Bangladesh occurs rapidly because of transparency, accountability, and citizen engagement. Though digital divide, lack of public awareness, inconsistent power supply create hindrance but by bridging among these gap and proper e-governance create a huge opportunity for Bangladesh as the new rising sun of Asia in upcoming years and might achieve its vision of Smart Bangladesh.

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