

E-Governance Initiatives at the Union Level in Bangladesh: Assessing their Operation and Advancement

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Abstract

E-Governance initiatives promise to transform governance and enhance service delivery at the union level in Bangladesh. This study examines the effectiveness and challenges of implementing these initiatives in Kushtia Sadar Upazila, focusing on service recipients and providers. A mixed-method approach including surveys and interviews was used with 200 service recipients and 100 service providers. The study found that 80% of service recipients and 85.5% of service providers were male, indicating gender imbalances. Additionally, 83% of service recipients had digital literacy skills, but only 16.58% gained these skills through formal education, often citing inadequate materials and unskilled trainers. Key challenges included infrastructural constraints, bureaucratic hurdles and a lack of awareness among service recipients. Server

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downtime and poor internet connectivity were the major findings where 74% were exposed to poor internet connectivity and 48% had significant disruption of server problem. Despite these obstacles, 79.5% of service recipients expressed optimism about e-governance reducing corruption and improving governance practices. Recommendations stemming from the findings include infrastructural investments, capacity-building programs and enhanced citizen engagement initiatives. The study underscores the transformative potential of e-governance initiatives at the union level and highlights the need for concerted efforts to address implementation challenges and maximize benefits for citizens.

Keywords: e-governance, service delivery, digital literacy, union level governance.

1. Introduction

The concept of e-governance at the union level in Bangladesh has garnered significant attention due to its potential for improving service delivery, transparency, and citizen participation. As a developing country, Bangladesh is no longer taken out of this consideration (Ahmed, 2019). There is a progressive milestone towards the status of e-governance in Bangladesh in the global context. According to the E-Governance Development Index (EGDI) of the United Nations Report 2022, Bangladesh holds the first position (EGDI score 0.5630) among 46 least developed countries, which has doubled in the past decade (EGOVKB | United Nations, 2022). The Union Digital Centers (UDCs) have been established throughout the country by the government of Bangladesh to decentralize public service delivery while bringing it closer to the people (Anam, 2021). It offers a unique opportunity to transform government service delivery with an assortment of almost

230 different types of government and commercial e-services (Karim, 2023). As a part of the Digital Bangladesh initiatives, it has implemented e-government which has decreased the number of in-person trips required to access government services, decreased the average wait time for a visit and increased customer satisfaction (Chowdhury, 2020). Aspire to Innovate - a2i is carrying out several citizen-friendly government service projects as part of government efforts. To digitize government services, an integrated digital service design lab has been set up. Currently, 427 services have been digitized and 1,844 services have been designated for the change under 29 ministries or divisions (Salahuddin, 2024). But why focus on the Union level? First of all, it closes the gap existing between local reality and national policy. Secondly, addressing rural governance issues claims attention to the Union level. The primary objective of e-governance is to enhance national competitiveness by improving the effectiveness of government institutions. South Asian countries including Bangladesh, e-governance is still in its early stages (Ahmad, 2021). It is anticipated that Korea's experience with regards to developing e-government technologies and systems would benefit in building its e-government and promoting the ICT sector as it deploys the e-government system in Bangladesh (ICT Division, 2019). But the execution of e-governance initiatives in Bangladesh is beset by a number of challenges, such as inadequate levels of infrastructure, a lack of knowledge and experience among personnel and insufficient resources available to the public sector (Alam, 2020). Robust e-governance systems are difficult to build and maintain at the union level due to a lack of budgeting along with qualified professionals. Traditional mindsets and bureaucratic inertia within local government can create a wall of resistance to change the system while anxieties about data security and privacy raise concerns about venturing into the digital realm. The setting

in which e-government is implemented and how well the government can respond to these external factors remain critical to digital government proliferation, the study elucidated those things (Dhaoui, 2019). This study consisted of some hypothesis such as digitalization strategies, ICT infrastructure development and Beneficiaries' satisfaction significantly influence to the status of e-governance. This study also explores a road map proposed for LDCs, investigates Bangladesh's existing scenario at the union level, highlights its successful initiatives, identifies the significant challenges and puts forward some recommendations for the future. It will also tip the balance regarding the possibility of e-government at the union level in Bangladesh as well as its appraisal and designations. The progresses of e-governance initiatives at union level in Bangladesh are primarily evaluated through measuring the effectiveness of Union Digital Centers (UDCs), formerly known as Union Information Service Centers (UISCs). The Government of Bangladesh has established 4547 UDCs at union level throughout the country to provide doorstep services to the rural community (Saleheen, 2020). The evaluation procedures typically include user-centric assessment- that is to evaluate the satisfaction level of both service receivers (citizens) and service providers (UDC entrepreneurs); quantitative and qualitative methods- that is to conduct surveys, case studies etc. to gather in-depth insights on service availability, satisfaction, service cost, convenience etc. from stakeholders; and e-service delivery indicator analysis/ performance indicator analysis- that is to measure the performance of UDCs against the principles of e-service delivery including factors like service quality, responsiveness and information availability. The evaluations are often conducted by government bodies, external researchers and non-government organizations. Key aspects of these assessments are user satisfaction, e-service delivery quality and institutional infrastructure.

1.2 Conceptual Clarification of E-Governance

Governance, popularly known as e-governance, is the extensively application of information and communication technologies to the government functions with a view to ensuring greater convenience and better services for all citizens and ultimately leading to a knowledge-based society. The notion of e-governance arose alongside the swift progression of information and communication technologies in the late 20th century (Khouya, 2023). It was initially conceived as a component of public administration reform. It has since evolved into a significant social challenge and a mechanism that is capable of enhancing administrative-services and user satisfaction, as well as fostering deeper forms of democracy (Misuraca, 2012). E-governance refers to the use of ICT tools for streamlining and improving democratic governance in internal government activities as well as interactions with enterprises and citizens (UNPAN, 2011). It is a technology-mediated service that makes it easier the relationship between government and citizen (Oakley, 2002). E-governance is the use of ICTs in public administration to improve information and services, engage citizens in decision-making processes, and increase accountability, transparency, and effectiveness in government operations (UNESCO, 2005). Rehka Prasad, a faculty of management studies in Banaras Hindu University, identified three guiding principles of e-governance: a) Citizen-Centered (not bureaucracy or agency centered); that is to focus on the needs of citizens, b) Results-Oriented; that is to produce measurable improvements for citizens, and c) Market-Based; that is to actively promote innovations. In addition, there are some core principles of e- governance which may include accessibility, transparency and accountability, privacy and data security, efficiency and effectiveness, capacity

building, greater public participation, interoperability etc. E-governance efforts offer multifaceted benefits to the nation such as- a) it increases access to government services including access to healthcare, education and other services; b) it helps lessen corruption in the administration and ensures openness and accountability in the delivery of public services; c) it increases efficiency and effectiveness of government organizations; d) it facilitates interactions between government and citizens; e) it helps to achieve transparency and strengthens organizational trust; f) it enhances citizen participation in the decision making process and the ability to provide insights on government programs and services; and g) it reduces paperwork and red-tapism in the administrative process which results in cost reduction and more efficient government management. There are basically 4 types of interactions in e-governance which are: a) G2C (Government to Citizen) - it is the most basic aspect of interaction in e-governance. It involves interaction between the government and the individual citizens which enables the later to have quick access to state-services like transportation, hospitals, e-education, e-registration, online job portals etc.; b) G2G (Government to Government) - it refers to the interaction between various departments and agencies within government or between two governments. Initiatives are e-administration, e-police e-courts etc.; c) G2B (Government to Business) – it involves interaction of business communities with the government by using e-governance tools. It includes e-transaction initiatives such as e-taxation, e-licensing, e-tendering etc.; and d) G2E (Government to Employee) – this type of interaction is occurred between the government and its employees which includes initiatives like e-learning, e-training, e-conferencing, consolidating the employees, sharing knowledge among the employees, and access to relevant information regarding employee compensation and benefit policies.

1.3 Conceptual Framework

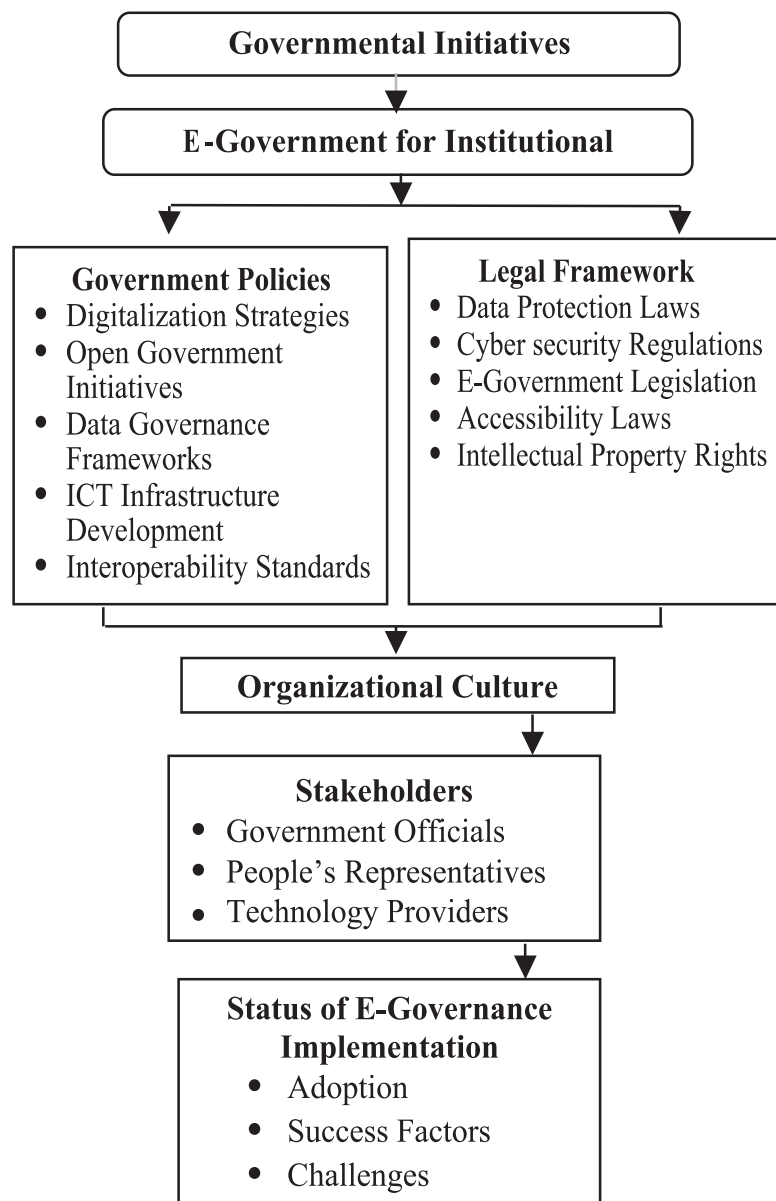


Figure 1: Conceptual Framework of the Study

2. Methods

The research design for this study adopted a mixed-method approach, combining quantitative and qualitative methodologies to comprehensively assess the implementation of e-governance at the Union level in Kustia Sadar Upazila. Quantitative method was employed to gather numerical data on service recipient perceptions, satisfaction levels and key performance indicators related to e-service delivery. Qualitative method including interviews and focus group discussions was utilized to delve deeper into the underlying factors influencing e-governance implementation.

2.1 Data Collection Techniques

Primary data: The following techniques were used to collect primary data.

Interviews

Semi-structured interviews were conducted with key informants like Union Parishad Chairmen, government officials, and technical experts to gain an in-depth understanding of policy frameworks, implementation processes and technical challenges.

Focused Group Discussions (FGDs)

FGDs were employed to gather qualitative data to check the service delivery and to identify and analyze the main factors to the impediment like digital literacy barriers or service preferences of implementing e-governance at the union level in Bangladesh.

Questionnaire Survey

Closed-ended questions were used to gather quantitative data on factors such as stakeholders'

perceptions of e-governance effectiveness, while open-ended questions were employed to elicit qualitative insights on specific service delivery, challenges and recommendations for improvement.

Secondary Data: Secondary data were collected from government documents and reports, research papers and academic publications.

2.2 Population and Sampling

The study focuses on residents, government officials, and community leaders from Kushtia Sadar Upazila. A stratified random sampling technique was used for quantitative surveys and purposive sampling was employed for qualitative interviews and focus group discussions. Approximately, 300 participants were sampled across this Upazila. From these participations, 95% ensures a high confidence level and the rest of the percentages can be margin of error.

Table 1: Sample size of the study

Name of Upazila	Name of Union	Category of interviews	Respo-ndents No
Kushtia Sadar	1. Ailchara	Secretary, Union Parishad	10
	2. Alampur		
	3. Battail		
	4. Goswami		
	Durgapur	Chairman, Union Parishad	10
	5. Harinarayanpur		
	6. Hatsh Haripur	Entrepreneur, Union Parishad	20
	7. Jhaudia		
	8. Monohordia	Member, Union Parishad	60
	9. Patikabari		
	10. Ziarakhi Union	Service recipients	200
			Total=300

Source: Field Data Collection, 2025

From Each union, an equal number of respondents (1 secretary, 1 chairman, 2 entrepreneurs, 6 members, and 20 service recipients) participate in this study of data collection.

2.3 Data Analysis

For descriptive statistics, mean, median and standard deviation were used to summarize the key findings. Inferential statistics such as regression analysis was used to explore relationships between variables. Data visualization techniques were utilized to present the findings in a clear and accessible manner, enhancing interpretation and understanding by stakeholders and decision-makers. Sensitivity analysis was conducted to assess the robustness of the study findings and address potential sources of uncertainty or bias.

3. Results

3.1 Findings from the Questionnaire Survey

Table 2: Demographic Information of the service

<i>Educational Qualification</i>	N	Frequency (%)
No formal education	6	6.00%
Primary	10	10.00%
Secondary	36	36.00%
Higher Secondary	12	12.00%
Under Graduate	1	1.00%
Graduate	35	35.00%
<i>Gender</i>		
Male	80	80.00%
Female	20	20.00%
<i>Digital literacy skill</i>		
Not at all	17	17.00%
Basic	34	34.00%
Intermediate	18	18.00%
Advance	21	21.00%
Proficient	10	10.00%

Source: Field Data Collection, 2025

The data in table 2 provide an overview of the demographic characteristics of the service providers involved in the study focusing on their educational qualifications and gender distribution. The distribution of educational qualifications among service providers is relevant to the first hypothesis which posits that the skill of stakeholders significantly influences the progress of e-governance. The data show that a significant proportion of service providers has attained secondary education or higher education with 84% having completed secondary education or above. This suggests a relatively well-educated workforce, which may possess the digital literacy skills necessary for effectively engaging with e-governance initiatives. On the other hand, the majority percent of service providers are male, comprising 80% of the total sample. While there is a gender imbalance in the service provider workforce, it is important to consider the implications of gender diversity for e-governance implementation. The percentage distribution of digital literacy skill levels among service providers offers valuable insights into the overall landscape of e-governance implementation. With 34% possessing basic skills and 18% having intermediate proficiency, it indicates a substantial portion of the workforce may require additional support to fully engage with e-governance platforms. On the other hand, the presence of 21% classified as advanced and 10% as proficient highlights a promising segment capable of leveraging digital tools effectively.

Table 3: Demographics of the service recipients

<i>Age of the respondents</i>	<i>N</i>	<i>Frequency (%)</i>
Under 18	4	2.00%
18-30	82	41.00%
31-45	80	40.00%
46-60	26	13.00%
Over 60	8	4.00%
<i>Gender</i>		
Male	171	85.50%
Female	29	14.50%
<i>Family/Individual Monthly Income</i>		
Below 10K (BDT)	39	19.50%
11-20K (BDT)	100	50.00%
21-30 K (BDT)	49	24.50%
31-40K (BDT)	4	2.00%
41-50K (BDT)	8	4.00%
<i>Occupational Status</i>		
Student	56	28.00%
Service holder	27	13.50%
Business owner	42	21.00%
Farmer	42	21.00%
Homemaker	19	9.50%
Lawyer	1	0.50%
Lessee	1	0.50%
Graphic Designer	1	0.50%
Laborer	6	3.00%
Doctor	1	0.50%
Teacher	4	2.00%

Source: Field Data Collection, 2025

The data provided in table 3 outline the demographic characteristics of the service recipients involved in the study. The demographic variables of age, gender, monthly

income and occupation among service recipients provide crucial insights for understanding the context and potential challenges of implementing e-governance initiatives. The majority percent of respondents fall within the age range of 18 to 45 years, with 82 respondents (41%) aged between 18 to 30 years and 80 respondents (40%) aged between 31 to 45 years. This indicates a relatively youthful demographic profile among service recipients, with the majority being young adults and middle-aged individuals. The age distribution highlights generational dynamics and varying levels of digital literacy, guiding the design of user-friendly platforms catering to diverse age groups. Gender distribution reveals potential disparities in access, prompting the need for inclusive design features to ensure equitable participation. Moreover, it shows a notable gender imbalance among service recipients, with males comprising the majority at 85.5% (171 respondents) compared to females at 14.5% (29 respondents). This gender disparity may have implications for understanding and addressing the diverse needs and perspectives of service recipients, particularly in the context of e-governance initiatives.

The distribution of respondents based on monthly income levels provides insights into the economic status of service recipients. The majority of respondents have a monthly income ranging from 11,000 to 30,000 BDT, with 50% falling within the 11-20K BDT range and 24.5% within the 21-30K BDT range. This suggests a predominantly middle-income group, with relatively few respondents having higher or lower income levels. The occupational distribution of service recipients reveals a diverse range of professions represented in the sample. The most common occupations include students (28%), business owners (21%), and farmers (21%), followed by service holders (13.5%) and homemakers (9.5%). This diversity highlights the varied backgrounds and roles of

individuals accessing e-governance-services, which may influence their needs, expectations, and experiences with these-services.

Influence of Digital Literacy Skill

Digital literacy attainment through formal education among service recipients reveals an almost equal split, with 51% indicating no formal education background contributing to their digital literacy skills and 49% reporting that they gained digital literacy through formal education.

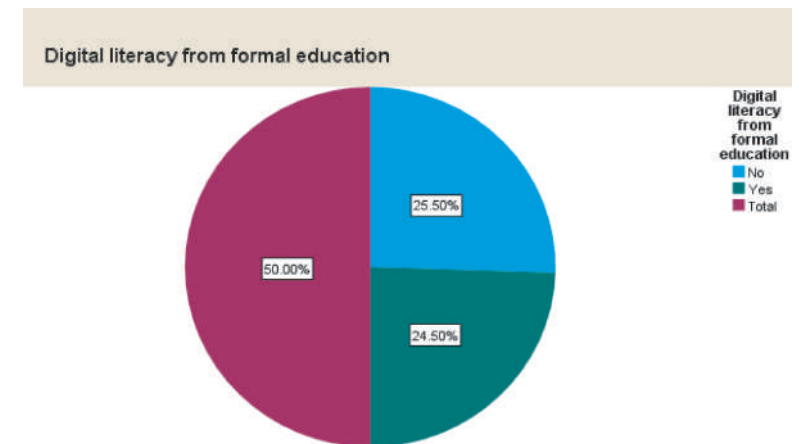


Figure 2: Digital literacy skill

Figure 2 illustrates this dichotomy and underscores the diverse pathways through which individuals acquire digital skills, shaping their ability to engage with e-governance initiatives effectively. While nearly half of the respondents attribute their digital literacy to formal education, the substantial portion lacking such educational background suggests the presence of alternative avenues for skill development, such as vocational training, self-learning, or on-the-job experience.

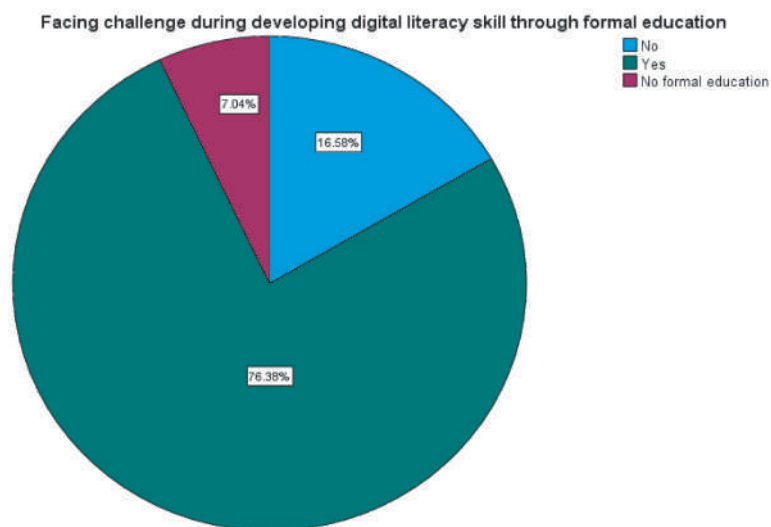


Figure 3: The challenge of digital literacy skill through formal education

In the figure 3, the researchers saw that the acquisition of digital literacy through formal education highlights a significant concern, with a substantial majority, comprising 76% of respondents, reporting encountering obstacles in this process. This indicates a prevalent issue within formal educational settings, potentially impeding the effective development of digital literacy skills among learners. Moreover, a noteworthy proportion of respondents, accounting for 16.5%, reported no challenges encountered, suggesting a potential discrepancy in experiences or perceptions regarding the adequacy of support within educational institutions. The presence of challenges in formal education can be indicative of various systemic issues, including inadequate infrastructure, insufficient training or expertise among educators, or curriculum gaps.

E-Governance initiatives Facilitating or Impeding?

Service recipients' perceptions of e-governance initiatives present a nuanced perspective, with a majority (64.5%) viewing e-governance as a facilitator, while a notable proportion (34.5%) perceive it as impeding.

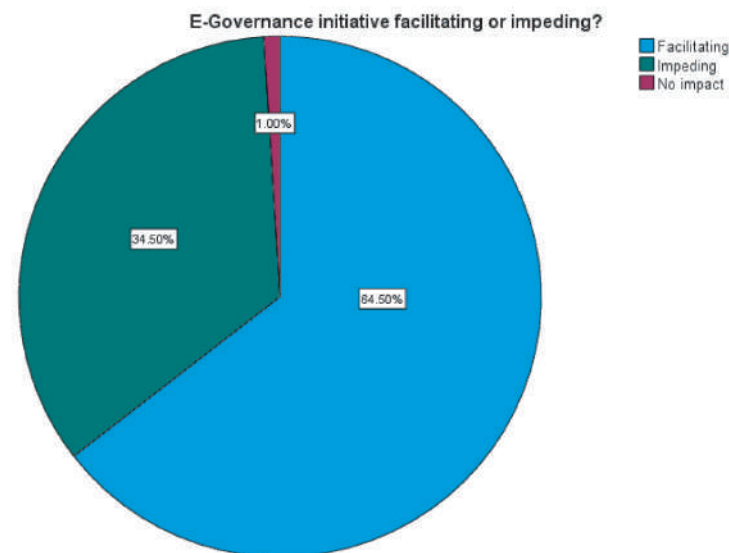


Figure 4: E-Governance facilitating or impeding

Figure 4 represents the divergence in perception underscores the complex interplay between the benefits and challenges associated with e-governance implementation. E-governance initiatives have the potential to streamline administrative processes, improve service delivery efficiency, and enhance citizen engagement. However, the realization of these benefits is contingent upon overcoming various obstacles. Challenges such as the prevalence of intermediaries exploiting digital platforms for personal gain, technical issues like internet connectivity and server downtime, and infrastructural constraints like electricity shortages can impede the effective functioning of e-governance systems.

E-Governance as a Tool for Reducing Corruption

A statistics from service recipients regarding their perception of the potential of e-governance to reduce corruption is presented in the following figure. A significant majority, comprising 79.5% of respondents, express confidence in the efficacy of e-governance as a tool for combating corruption and improving governance practices in Bangladesh.

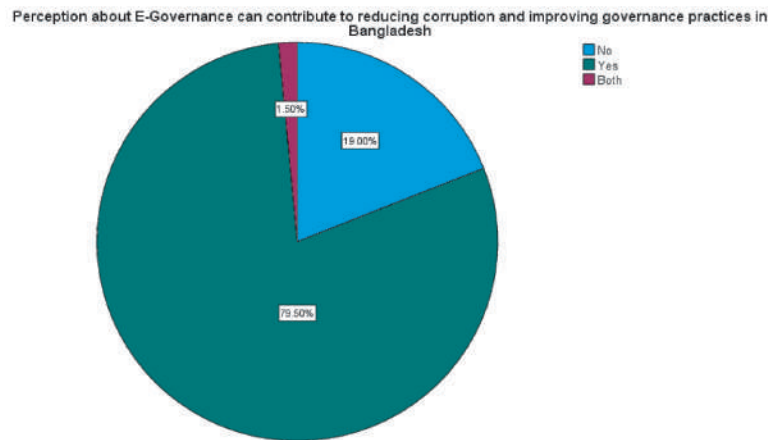


Figure 5: E-governance initiatives to reduce corruption and improve-governance practices

Expectation of Service Recipients about E-Governance

The data illustrates a prevailing sense of optimism among service recipients regarding the prospects of e-governance initiatives at the union level in Bangladesh. With over 90% of respondents expressing varying degrees of optimism, it reflects a profound belief in the transformative potential of e-governance. This sentiment is particularly noteworthy, as it suggests a collective faith in the ability of digital governance to address existing challenges and foster positive socio-economic

development. The significant proportion of respondents who identified as "Optimistic" and "Very Optimistic" underscores a widespread confidence in the efficacy of e-governance strategies.

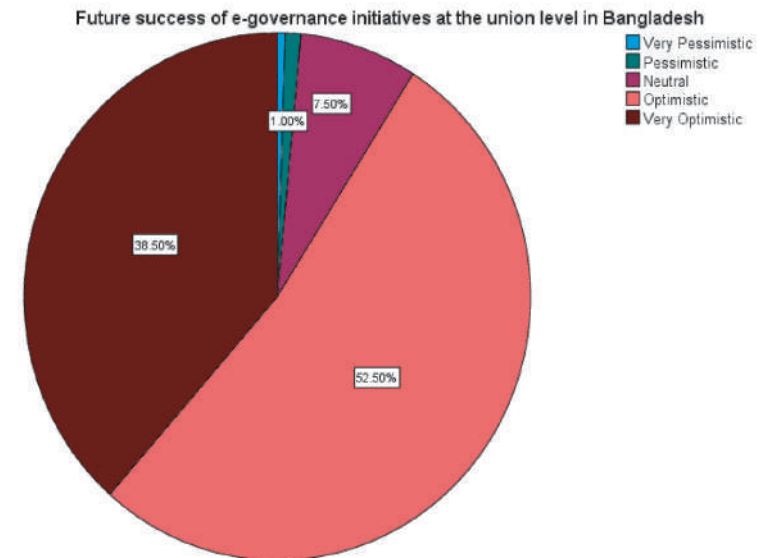


Figure 6: Future success of e-governance initiatives at the union level in Bangladesh

Such optimism may stem from the recognition of e-governance's capacity to streamline administrative processes, enhance service delivery, and promote transparency and accountability in governance.

Improvement Factors of E-Governance

It is a valuable insight into the perspectives of service recipients regarding improvement suggestions for e-governance initiatives. Among the key issues identified, lack of recipient awareness emerges as a significant concern, with 94.50% of respondents indicating a need for greater awareness-building efforts. This underscores the

importance of targeted campaigns and educational programs to enhance public understanding of e-governance-services, their benefits, and how to access them.

Table 4: Opinion on the improvement factors of e-governance

<i>Lack of recipient's awareness</i>	N	Frequency (%)
No	11	5.50%
Yes	189	94.50%
<i>Technological improvement</i>		
No	14	7.00%
Yes	186	93.00%
<i>Reduce bureaucratic hurdles</i>		
No	56	28.00%
Yes	144	72.00%
<i>Improve infrastructure constraints</i>		
No	70	35.00%
Yes	130	65.00%

Similarly, technological improvement is highlighted as a priority, with 93.00% of respondents advocating for enhancements in technology infrastructure and digital platforms. This emphasizes the critical role of investment in technology upgrades, including the development of user-friendly interfaces, mobile compatibility, and robust cybersecurity measures to ensure the reliability and accessibility of e-governance-services. Addressing bureaucratic hurdles is another pressing concern, with 72.00% of respondents calling for measures to streamline administrative processes and reduce bureaucratic red tape. This highlights the need for administrative reforms, including the simplification of procedures, automation of workflows, and the adoption of digital signatures to expedite service delivery and minimize delays. Moreover,

improving infrastructure constraints emerges as a key priority, with 65.00% of respondents advocating for investments in physical infrastructure such as internet connectivity, power supply, and ICT facilities.

3.2 Findings from Focused Group Discussion and Interview Survey

Evaluation Process of E-Governance Activities

A monitoring and evaluation system is pivotal in enhancing accountability within a workflow by offering transparency, real-time tracking, and objective performance metrics. It fosters trust among team members by providing visibility into task progress and responsibilities. This transparency enables proactive management, ensuring timely interventions and preventing workflow disruptions. The system's accountability metrics establish clear expectations and incentivize adherence to standards and deadlines, while also facilitating continuous improvement efforts by identifying optimization opportunities. Approximately 42% of respondents affirm that their activities are subjected to monitoring and evaluation, with external bodies such as UNO, DDLG, and DC often cited as overseeing authorities. This contingent emphasizes the importance of such monitoring in ensuring accountability, transparency, and compliance with regulations. They view this oversight as integral to maintaining the integrity of processes and preventing misuse of resources. Conversely, the remaining 58% of participants either express uncertainty about the extent of monitoring or outright deny its existence.

Infrastructural Challenge hindering the implementation of e-governance

Infrastructure challenges pose significant barriers to the effective implementation of e-governance initiatives.

These challenges encompass various technological, logistical, and resource constraints that impede the seamless integration and utilization of digital platforms for government services. One prominent infrastructural challenge is inadequate internet connectivity, particularly in rural or remote areas where access to high-speed internet remains limited or unreliable. Without robust internet infrastructure, citizens are unable to access online government services, hindering the inclusivity and accessibility goals of e-governance. The performance of this initiative by the government will mostly depend on the infrastructural environment. To measure this variable, the study focuses on infrastructural development, electricity problems, internet problems, and server problems. The feedback provided by participants highlights several key challenges faced in implementing e-governance initiatives at the union level. These challenges encompass various aspects, including infrastructure limitations, lack of awareness and capacity, bureaucratic complexity, and resistance to change. Infrastructure limitations emerge as a significant hurdle, with participants identifying issues such as unreliable electricity supply, inadequate internet connectivity, and insufficient technological resources. These deficiencies hamper the effective digitization of processes and the delivery of online-services to constituents.

E-Governance Complexity and Future Prospects

E-Governance holds immense potential for improving government services and enhancing citizen engagement, its implementation is fraught with various complexities that must be carefully addressed. By addressing issues such as the digital divide, cyber-security, usability, interoperability, and regulatory compliance, governments can overcome these challenges and realize the full benefits of E-

Governance in advancing public administration and governance practices. The study collected a depictive discussion result to expose the complexity of E-Governance at the Union level through focused group discussion from the service recipients. The burning issue of the discussion about E-Governance is hope and trepidation. It is evident that the complexity of e-governance, particularly concerning the cash transfer method for government facilities targeting marginalized communities, is a pressing concern. Approximately 47% of participants expressed frustration and accused the system of depriving them of their entitled benefits. Specifically, issues with the cash transfer method, such as delays, errors, or exclusion from receiving benefits, were highlighted as significant challenges. Another complexity identified relates to the correction of birth certificates, particularly for older individuals. Participants noted that the digitization process required extensive documentation, including the birth certificates of not only the individual but also their parents and even grandparents. This bureaucratic requirement, coupled with the transition from handwritten to online records, was perceived as overly burdensome and complex, contributing to dissatisfaction with the new system. Furthermore, participants pointed out various other challenges associated with e-governance complexity, such as difficulties in navigating online platforms, technical glitches, and inadequate support for those unfamiliar with digital technologies.

3.3 Hypothesis Testing and Correlation for Mathematical Justification

Table 5: Hypothesis testing result

Hypothesis	Variables	Beta	P-value	Justification
Hypothesis 1: Digitalization strategies and ICT infrastructure development significantly influence the status of e-governance, with effective digitalization strategies and robust ICT infrastructure positively impacting the adoption, efficiency, and effectiveness of e-governance initiatives.	Internet Connectivity	0.200	0.002	There is a statistically significant positive relationship between internet connectivity and the progress of e-governance implementation, indicating that improved internet connectivity leads to better e-governance outcomes.
	Server Uptime	0.740	<0.001	Server uptime shows a strong and statistically significant positive effect on the progress of e-governance implementation. This suggests that ensuring consistent server uptime is crucial for the success of e-governance initiatives.

Hypothesis	Variables	Beta	P-value	Justification
	Electricity Problem	0.044	0.410	The p-value for the electricity problem is greater than 0.05, indicating that it does not have a statistically significant effect on the progress of e-governance implementation. Thus, electricity problems may not be a significant barrier to e-governance progress in this context.
Hypothesis result= “Supported”				
Hypothesis 2: Beneficiaries' satisfaction significantly influences the status of e-governance, with higher levels of satisfaction among citizens, businesses, and other stakeholders	Satisfaction Level for E-Governance Service	0.684	<0.001	Higher satisfaction levels with e-governance-services significantly correlate with higher ratings of e-governance initiatives.
	Service Response Time	0.309	<0.001	Shorter service response times are associated with higher ratings of e-governance initiatives, indicating improved efficiency and effectiveness.

Hypothesis	Variables	Beta	P-value	Justification
positively contributing to the success, sustainability, and overall effectiveness of the e-governance initiatives.	Bureaucratic Hurdle	0.015	0.457	Bureaucratic hurdles do not show a statistically significant effect on the rating of e-governance initiatives in this context.
Hypothesis result= “Supported”				

This study conducted regression analysis for hypothesis justification. For hypothesis 1, the regression analysis results provide valuable insights into the factors influencing the progress of e-governance implementation. This model shows approximately 80% of the variance in the progress of e-governance can be explained by the predictor variables included in the model, signifying a strong overall fit. The regression model is deemed statistically significant ($p < 0.001$), indicating that at least one of the predictor variables has a significant effect on e-governance progress. Delving into the coefficients, both Internet connectivity and Server uptime emerge as significant predictors of e-governance progress. Improved Internet connectivity is associated with higher levels of e-governance advancement ($\beta = 0.200$, $p = 0.002$), suggesting its pivotal role in facilitating the success of e-governance initiatives. Similarly, consistent server uptime demonstrates a significant positive effect ($\beta = 0.740$, $p < 0.001$) on e-governance progress, emphasizing the importance of maintaining uninterrupted server functionality for effective e-governance implementation. However, the analysis reveals that the electricity problem does not exert a significant effect ($p = 0.410$) on e-governance progress in this particular context. While surprising, this finding

suggests that electricity-related challenges may not be a major barrier to e-governance advancement in the studied area. In hypothesis 2, the coefficient of determining squared is 0.930, indicating that approximately 93.0% of the variance in the rating of e-governance initiative can be explained by the predictors included in the model. Moreover, it provides a strong positive relationship between the satisfaction level for e-governance service and the rating of e-governance initiative ($\beta = 0.684$, $p < 0.001$). This finding suggests that higher satisfaction levels among users positively influence the perception and effectiveness of e-governance initiatives. Conversely, the bureaucratic hurdle variable did not exhibit a significant effect ($\beta = 0.015$, $p > 0.05$). Therefore, while user satisfaction plays a crucial role in the success of e-governance initiatives, bureaucratic hurdles may not significantly impact the overall rating of e-governance initiatives.

The progress of e-governance implementation is rated at 2.42 with a standard deviation of 0.554. Regarding the facilitating factors, both internet connectivity and server uptime are reported at similar means of 2.50, with standard deviations of 0.905 and 0.541, respectively. However, the perceived challenge of electricity problems exhibits a higher mean of 4.17, indicating a more significant issue, with a standard deviation of 0.428.

Table 6: Correlation among the different variables (H1)

Variables	Mean	Std. Deviation	1	2	3	4
Progress of e-governance	2.42	0.554	1			
Internet connectivity	2.5	0.905	.665**	1		
Server uptime	2.5	0.541	.876**	.598**	1	
Electricity problem	4.17	0.428	.421**	.509**	.371**	1

** Correlation is significant at the 0.01 level (2-tailed).

A strong positive relationship is observed between the progress of e-governance implementation and both internet connectivity ($r = 0.665$, $p < 0.01$) and server uptime ($r = 0.876$, $p < 0.01$). This suggests that as these factors improve, there is a corresponding increase in the advancement of e-governance initiatives. Additionally, a moderately positive correlation is found between progress and electricity problems ($r = 0.421$, $p < 0.01$), albeit weaker compared to the other predictors. This implies that while electricity problems may hinder e-governance progress to some extent, their impact is not as pronounced as that of internet connectivity and server uptime.

Table 7: Correlation among different variables (H2)

Variables	Mean	Std. Deviation	1	2	3	4
Rating of E - Governance initiative	3.04	0.89	1			
Satisfaction level for e - service	2.97	0.913	.954**	1		
Service resp onse time	2.98	0.839	.910**	.886**	1	
Lack of awareness	0.95	0.229	0.06	0.04	0.047	1

** . Correlation is significant at the 0.01 level (2-tailed).

Table 8 shows the respondents' rating of e-governance initiatives stands at 3.04, with a standard deviation of 0.890. Similarly, the satisfaction level with e-governance-services is reported at an average of 2.97, with a slightly higher standard deviation of 0.913. Regarding service response time, the mean is 2.98, with a standard deviation of 0.839. In contrast, the perceived lack of awareness registers a notably lower mean of 0.95, with a standard deviation of 0.229, indicating a relatively consistent response among participants.

On the other hand, a remarkably strong positive relationship is observed between the rating of e-governance

initiatives and both the satisfaction level for e-governance-services ($r = 0.954$, $p < 0.01$) and service response time ($r = 0.910$, $p < 0.01$). This suggests that higher satisfaction levels and improved service response times are associated with more positive ratings of e-governance initiatives. However, there is only a weak positive correlation between the rating of e-governance initiatives and the perceived lack of awareness ($r = 0.060$, $p > 0.05$), indicating that awareness levels do not significantly impact the overall rating of e-governance initiatives.

4. Discussion

Bangladesh stands on the threshold of getting developing country status by dint of a technology-based smart economy and it's being considered as the successful pathway to Vision 2041. The outline is looking for a futuristic Bangladesh, with 5G internet, 100% smartphone adoption, 100% high-speed internet adoption, and turning cashless flow of transformation (Chowdhury, 2023). But the journey towards effective e-Governance implementation is not without its challenges. Through a comprehensive qualitative analysis of various stakeholders' perspectives, this report seeks to explore the complexities and barriers encountered in the process of E-Governance adoption. One of the primary challenges highlighted by participants is the digital divide, which refers to disparities in access to and proficiency with digital technologies. Though finding stated about the government proposed which is evaluating ICT proficiency in enrollment assessments for public service, making it obligatory for any individual working in government to acquire a foundational level of ICT literacy (Aziz, 2020). Similarly, the policy suggests partnerships between companies with universities for the advancement of "market-oriented" ICT skills and ICT research. Marginalized communities, including rural populations, the elderly, and individuals with limited

education or income, often face barriers to accessing E-Governance services. This digital exclusion exacerbates existing inequalities, hindering the equitable distribution of government services and exacerbating social disparities. In addition to the digital divide, concerns about data security and privacy have emerged as significant impediments to E-Governance adoption. Cyber security is crucial on e-government platforms since, among other things, the systems hold personal information that might lead to identity theft (Monzón, 2020). Participants expressed apprehension about the potential misuse or unauthorized access to their personal information stored in government databases. Addressing these concerns requires robust cyber security measures, stringent data protection policies, and mechanisms for informed consent and data transparency to safeguard citizen privacy rights. Moreover, the transition from traditional paper-based processes to digital platforms has introduced usability challenges for both citizens and government officials. Complex user interfaces, technical glitches, and insufficient training programs have hindered the effective utilization of E-Governance systems, leading to frustration and disillusionment among users. Enhancing user experience through user-centered design principles, user-friendly interfaces, and comprehensive training initiatives is essential to promote widespread adoption and acceptance of E-Governance solutions. Interoperability and integration issues have also emerged as significant hurdles in E-Governance implementation, particularly in multi-agency environments. Incompatible systems and data silos prevent seamless information sharing and collaboration across government departments, undermining the efficiency and effectiveness of service delivery. Overcoming these interoperability challenges requires standardized data formats, interoperable protocols, and coordinated governance structures to facilitate data exchange and integration across disparate systems. Furthermore, legal and regulatory complexities pose significant barriers to E-

Governance adoption, with participants highlighting the need for clear policies and frameworks to govern data collection, storage, and usage. Ambiguous regulations, bureaucratic hurdles, and compliance burdens impede innovation and slow down the pace of digital transformation in government services. Streamlining regulatory processes, harmonizing data protection laws, and fostering a supportive legal environment are essential to creating an enabling environment for E-Governance initiatives. A major obstacle to developing a complete ICT infrastructure continues to be inadequate access to energy supply. Constant electricity supply is necessary for the proper operation of any ICT-based service, such as e-governance. Moreover, this study showed a large amount of electricity demand and supply gap. There is a 1,500 MW to 3,000 MW shortfall as power plants are only producing between 12,000 and 13,500 MW whereas approximately 15,000 MW of power that is needed in Bangladesh (The Financial Express, 2022). A finding showed that the barriers to implementing e-governance in Bangladesh, a lack of ICT infrastructure 20%, Lack of Governance in formulating Government 14%, Lack of ICT experts 38%, Lack of promotion of e-service 20%, Lack of budget 3% existed. These findings highlight a range of challenges that need to be addressed effectively to implement e-governance at the union level in Bangladesh (ICT Division, 2019). Despite these challenges, participants expressed optimism about the potential of E-Governance to enhance transparency, accountability, and citizen engagement. By leveraging digital technologies, governments can streamline administrative processes, improve service delivery, and empower citizens to participate in decision-making processes. Moreover, some findings strengthen about the optimism of the study. Karim (2023) stated more than 71000 women will be empowered through the ICT division's "SHE POWER" initiative by 2026 and 2041 respectively where women will be engaged in online

commerce at a rate of 25% to 50%. People who live in rural and distant places must cover great distances at a cost in terms of both money and time due to their distance from public service providers. In response, UNDP has been promoting e-services for facilitating the delivery of public services, setting up e-governance platforms, building service centers, and streamlining administrative procedures (UNDP, 2019). However, addressing the complexities and barriers identified in this report requires a concerted effort from policymakers, technology providers, civil society organizations, and other stakeholders to realize the full potential of E-Governance as a driver of inclusive and sustainable development.

Conclusion

The evaluation of e-governance implementation at the union level provides valuable insights into the opportunities, challenges, and potential impact of digital governance initiatives in Bangladesh. Through a comprehensive analysis of quantitative data, qualitative feedback, and stakeholder perspectives, this study has shed light on the multifaceted nature of e-governance and its implications for governance practices, service delivery, and citizen engagement. The findings highlight the significant progress made in leveraging digital technologies to enhance administrative efficiency, transparency, and accountability in union-level governance. Improved access to government services, streamlined administrative processes, and increased citizen participation reflect the transformative potential of e-governance in fostering inclusive development and empowering local communities. However, the study also underscores the complex challenges and barriers that hinder the effective implementation of e-governance initiatives. Issues such as inadequate technological infrastructure, digital literacy gaps, data security concerns, and bureaucratic hurdles pose

significant obstacles to the widespread adoption and success of digital governance solutions. Despite these challenges, the study reveals promising opportunities for addressing key gaps and improving e-governance outcomes. Recommendations such as strengthening capacity-building efforts, enhancing technological infrastructure, promoting citizen engagement, ensuring data security, fostering collaboration, and monitoring impact can inform policy and practice to drive positive change and innovation in e-governance implementation.

Conflict of Interest

The authors affirm that they have no conflict of interest in relation to the authorship and publication of this study.

Authors' Contributions

AH conceptualized the idea. KA and HI conducted the literature review and developed methodologies. AH analyzed and interpreted data. HI wrote original draft, reviewed and edited the submitted manuscript. All authors declare that they have reviewed and endorsed the paper and accept full responsibility for its content.

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References

- Ahmad, T. (2021). E-Government in Bangladesh: Development and Present State. *International Journal of Social Science And Human Research*, 4(1), 98-108. doi: 10.47191/ijsshr/v4-i1-15
- Anam, A. S. M. T. (2021). E-government in rural Bangladesh: Exploring the shortcomings of union digital centre management, *Dynamics of Public Administration*, 38(2), 117-128. doi:10.5958/0976-0733.2021.00009.2
- Aziz, A. (2020). Digital Inclusion Challenges in Bangladesh: The Case of The National ICT Policy, *Contemporary South Asia*, 28(3), 304-319. doi: 10.1080/09584935.2020.1793912
- Baroi, H. S. & Alam, S. (2020). Operationalizing the Right to Information Act through E-Governance in Bangladesh: Challenges and Opportunities, *International Journal of Public Administration*, 44(1), 1-14. doi:10.1080/01900692.2020.1747489
- Bhuiyan, S. H. (2011). Modernizing Bangladesh Public Administration through e-governance: Benefits and Challenges, *Government Information Quarterly*, 28(1), 54-65. doi:10.1016/j.giq.2010.04.006
- Chowdhury, A. (2020, November). *How Bangladesh is seizing the opportunities of e-governance*. World Economic forum: <https://www.weforum.org/agenda/2020/11/bangladesh-and-digital/>
- Chowdhury, A. (2023). What is Smart Bangladesh really? a2i. <https://a2i.gov.bd/a2i-missions/smart-bangladesh-vision-2041/>

- Choudhury, S., & Kumar, S. (2009). E-Governance: Tool for E-Democracy and Citizen Empowerment in the Horizon of Information Technology Era in Developing Society in India, Nepal and Bangladesh. In G. P. Sahu, Y. K. Dwivedi, & V. Weerakkody (Eds.), *E-Government Development and Diffusion* (pp. 101–120). IGI Global. <https://doi.org/10.4018/978-1-60566-713-.ch007>
- Dhaoui, I. (2019, January). Electronic government: An overview of opportunities and challenges. *MPRA*. <https://mpra.ub.uni-muenchen.de/92545/>
- EGOVKB United Nations. (2022). *Regional E-Government Development and the Performance of Country Groupings*. <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2022>
- Faisal, M. Z. & Ahmed, F. (2019). Promoting e-Governance in Public Service Delivery: The Case of Union Digital Centres of Bangladesh, *Asian Studies, Jahangirnagar University Journal of Government and Politics*, 38(June 2019),85-94.
- Grigalashvili, V. (2022). E-government and E-governance: Various or Multifarious Concepts, *International Journal of Scientific and Management Research*, 5(1) (Jan), 183-196. doi - <http://doi.org/10.37502/IJSMR.2022.5111>
- Hoque, S.M.S. & Al Kabir, M.A. (2024). Assessing ICT and e-government service through UDC in Bangladesh: rural dwellers' economic benefits, *Electronic Government*, 20(2), 161–174.
- ICT DIVISION. (2019, August). Background. *e-Government Master Plan for Digital Bangladesh*.

- Islam, M. S. (2005). E-Governance in Bangladesh: Challenges and Options, *NDC E-JOURNAL*, 4(1), 57-92.
- Karim, M. R. (2015). E-Government in Service Delivery and Citizen's Satisfaction: A Case Study on Public Sectors in Bangladesh, *International Journal of Managing Public Sector Information and Communication Technologies (IJMPICT)*, 6(2), 49-60. doi: 10.5121/ijmpict.2015.6205
- Karim, M. R. & Hosen, S. (2023). Implementation Challenges of ICT in the Public Sector in Upazila Region of Bangladesh: An Empirical Study, *Vidyodaya Journal of Management*, 9(1), 142-173. doi:10.31357/vjm.v9i1.6376
- KHOUYA, M. (2023). E-Governance: Origin, challenges, and prospects in the era of ICTs and artificial intelligence, *African Scientific Journal*, 3(18), 884-900. doi: 10.5281/zenodo.8319464
- LGED. (n.d.). *LGED Kushtia*. Retrieved 2024, from LGED: <http://oldweb.lged.gov.bd/UploadedDocument/Map/KHULNA/Kushtia/kushtia-s/kushtia-s.jpg>
- Monzón. (2020). Security Versus Usability in E-Government: Insights from the Literature. In *Proceedings of the International Conference of Research Applied to Defense and Security, Quito, Ecuador*.
- Rahman, A. & Malik, A. R. (2020). Electronic governance in Bangladesh: challenges and prospects, *International Journal of Natural and Social Sciences*, 7(4), 56-65.

- Rahman, M. (2023). The Implementation of E-Governance Initiatives Plays a Crucial Role in Ensuring the Realization of a Digital Bangladesh, *Journal of Public Representative and Society Provision*, 3(2), 58-66. doi:10.55885/jprsp.v3i2.278
- Salahuddin, M. (2024). *What will the future Smart Government be like?* Bangladesh Post. Retrieved from <https://bangladeshpost.net/posts/what-will-the-future-smart-government-be-like-130643>
- Saleheen, S. A. (2020). UDC and e-Service Delivery at Local Government Level in Bangladesh: A Framework for e-Government, *Bangladesh Journal of Public Administration (BJPA)*, 8(2), 103-117. doi: <https://doi.org/10.36609/bjpa.v28i2.108>
- Sharfaraz, G. M. & Khan, N. A. (2018). A Probe Into E-Government Services In Rural Bangladesh: The Case Of Union Digital Centers (Udcs), *Bangladesh Journal of Administration and Management*, 30(1).
- The Financial Express. (2022). *Bangladesh electricity crisis deepens as demand-supply gap widens*. The Financial Express. <https://thefinancialexpress.com.bd/national/bangladesh-electricity-crisis-deepens-as-demand-supply-gap-widens-1665372369>
- UNDP. (2019). *UNDP Independent Evaluation Office*. <https://erc.undp.org/evaluation/evaluations/detail/12265>