

Article

# Transparency Level of E-Government Systems of Bangladesh

Eva Chowdhury <sup>1</sup>, Md. Asaduzzaman <sup>1,\*</sup> and Sidratul Muntaha <sup>1</sup>

<sup>1</sup> School of Business Administration, East Delta University (EDU), Chattogram (4209), Bangladesh

\* Correspondence: asadsafs8@gmail.com; Tel.: +8801816516918

Received: July 2, 2025; Received in revised form: September 16, 2025; Accepted: September 28, 2025; Available online: September 30, 2025

**Abstract:** The purpose of this research is to assess the transparency of Bangladesh's electronic government (e-government) systems. Using 23 transparency categories extracted from the Website Attribute Evaluation System (WAES) agenda, web scraping and the content analysis technique were utilized to appraise the e-government systems' transparency level. The information collected from the WAES was analyzed utilizing the frequency and percentage in accordance with the numerous transparency categories. This study shows that an overall transparency level of 66.11% was indicated by the e-government systems' publication of 15.21 of the 23 WAES transparency disclosure components. The Malaysia Government Portals and Website Assessment (MGPWA) interprets the score as suggesting a high degree of transparency, with an overall rating of four stars. The results of the current study provide encouraging evidence that the administration is making progress, especially in its attempts to increase government transparency and lower the degree of illicit activity. This research is one of the few that aims at addressing a basic problem of transparency in the e-government systems, which is closely linked to the prevalence of misconduct.

**Keywords:** E-Government; Content Analysis; Web Scraping; Transparency; Website Attribute Evaluation System (WAES)

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## 1. Introduction

E-government utilizes information technology (IT) and information systems (IS) to deliver administrative and public services at the local, state, or federal levels [1]. It offers platforms for management and communication between organizations, businesses, and people, either alone or in concert [2]. The use of information and communication technologies (ICT) by governments to enhance the quality and scope of services and information offered to citizens, businesses, and other government agencies is known as e-government systems [3], [4], [5], [6]. The larger process of digital transformation in the public sector includes e-government systems [7]. Nations with effective e-government can reduce the administrative burden on corporations and residents while enhancing the transparency, accountability, and efficiency of the government [8], [9].

Transparency is an essential component of successful government. It encourages accountability by producing comprehensive reports regarding requests and transactions [10]. Transparency enables individuals, organizations, and investors to gather and analyze government data to provide insightful information and knowledge. Transparency is deeply connected with government operations and decision making, and it is seen as a necessary tool for maintaining a balance of power

between the public and the government and as one of the prerequisites for successful governance [11]. Corruption, scandals, poor decision-making, public officials' irresponsibility, and dysfunctional management of government agencies are frequently linked to a lack of sincerity in government operations and decision-making processes [12].

E-government systems are becoming increasingly prevalent in public administrations globally, including Bangladesh. Several Bangladeshi administrations have launched significant efforts in recent years to integrate IT and its capabilities into government operations in figure 1. The focus has been on boosting efficiency and offering the citizens improved services [13]. Ten years after the e-government systems was introduced, Transparency International Bangladesh (TIB) has identified serious issues that threaten the system's primary goals of openness and competition in the public sector [14]. By making all government data and information accessible to the public, e-government systems aim to increase transparency in the governing process. Its purpose is to inform the public about the government's policies and keep them updated [15]. In order to provide both economic and social amenities to its people in an economical way, Bangladesh stands to benefit greatly from e-Government services. However, strategic planning is required to guarantee efficiency, agility, transparency, and citizen engagement in the provision of public services if e-government systems are to achieve long-term progress [16].

Recognizing the importance of the e-government systems, many countries, including Brazil [17], Nepal [18], and Poland [19], have used the Website Attribute Evaluation System (WAES) to assess the transparency of e-government systems in their particular countries. Overall, the results show that the e-government systems in those countries are not very transparent [17], [20]. But unfortunately, there is a serious dearth of studies on the degree of transparency of e-government systems in developing countries, such as Bangladesh, except few Asian countries in India [21], Malaysia [20], Sri Lanka [22], and China [23]. In addition, prior studies only deployed WAES, but did not use a more rigorous tool such as Web Scraping to compare and contrast the results.

By identifying the research gap, this study aims to appraise the degree of transparency of the e-government systems in Bangladesh by using the WAES, a tool that other nations have used to assess the transparency level of their e-government systems. This tool is appropriate to measure the website accessibility, accuracy, timely and whether the it is understandable to the public at large [20]. Moreover, WAES captures the key components of transparency, such as, content availability, accessibility, usability, and quality[24]. The public's ability to obtain data about government policies, decisions, and actions is made possible by higher levels of e-government systems transparency, which helps the public comprehend how the government functions in a developing nation like Bangladesh. When citizens have access to information, they can use the websites to offer the government enlightening views. An essential component of evaluating the transparency level of the e-government systems is the administration's duty to notify all parties involved about the usage of public funds.

The remaining part of the paper is organized as follows. The development of Bangladesh's e-Government systems is described in Section 2. The literature review is in Section 3. The research methodology is explained in Section 4, while Section 5 presents the study's findings and discussions. The study's limitations and recommendations for further research are presented in Section 6.

## 2. Development of E-Government Systems in Bangladesh

A historical understanding of the connection between technology and administration is essential to comprehend the evolution of e-Government [8]. Technology's accountability was restricted to providing infrastructure for decision-making and resolving issues with a limited explanation [25]. It suggests that technology was utilized to automate administrative operations and boost the productivity of clerical employment prior to the development of the Internet and computers [26]. As a result, government IT specialists were excluded from administrative and operational supervision.

In the 1990s, governments only used IT for internal and managerial purposes before e-government was adopted and the Internet became widely used. Later, in the 1990s, as the internet gained popularity, IT was included in restructuring programs, which led to the "redesigning government" movement [27]. Since then, the United States has provided the organizational and financial framework for extensive e-Government applications through the creation of a governmental portal, the passage of significant laws, the incorporation of IT into strategic planning, and ultimately the creation of the 2001 E-Government Act.

Government transparency and efficiency have increased since the late 1990s when ICTs were used [28]. Early e-government actions aimed to change citizens' expectations of how services are provided and tackle the challenges in government institutions. The public also anticipated that the government's decision-making procedures will be more open and transparent. One of e-Government's success stories is eEurope, which is very result-oriented and politicized. Through the use of a comprehensive systems of key indicators and benchmarking reports to leaders for evaluation and further action, the EU has demonstrated its ability to track, observe, analyze, and assess its execution of every initiative program [29]. The first lessons that emerging nations might gain from eEurope are likely to be the benefits of political leadership and dedication through successful execution.

In 2009 election statement, the Bangladesh Awami League pledged to transform Bangladesh into a "Digital Bangladesh" by 2021. They began transforming several governmental offices and implementing e-government. On the other hand, Bangladesh has a long history of implementing e-government. The IBM computer was first placed in the Bangladesh Atomic Energy Commission before to Bangladesh's independence in 1964 [30]. After then, it took a while to move forward. The government of Bangladesh established the Bangladesh Computer Council in 1971, and the Bangladesh Association of Software and Information Services (BASIS) in 1998 to create various software to meet the needs of the government and citizens by digitizing other government operations [31].

Simultaneously, government and business institutions began employing recent graduates of E-Government: Present Scenario and Future 75 ICT to create software and digitize office operations. To ensure that no one is denied access to government information services, the government set up 4554 digital centers to spread knowledge among the impoverished in rural areas [32]. As a result, information communication has greatly advanced both public and commercial institutions. The Ministry of Religious Affairs of Bangladesh developed the website in 2002 to streamline the Hajj process so that pilgrims may perform it hassle-free [33]. The ITC policy was developed that same year in order to guarantee high-quality services and increase the efficacy and efficiency of government operations. In every field, the government began implementing and utilizing ICT. Bangladesh has consequently maintained economic growth and significantly decreased poverty [34]. Since then,

Bangladesh has been using information and communication technology to boost its economy. Although the state of the e-governance index is not good, things are getting better every year.

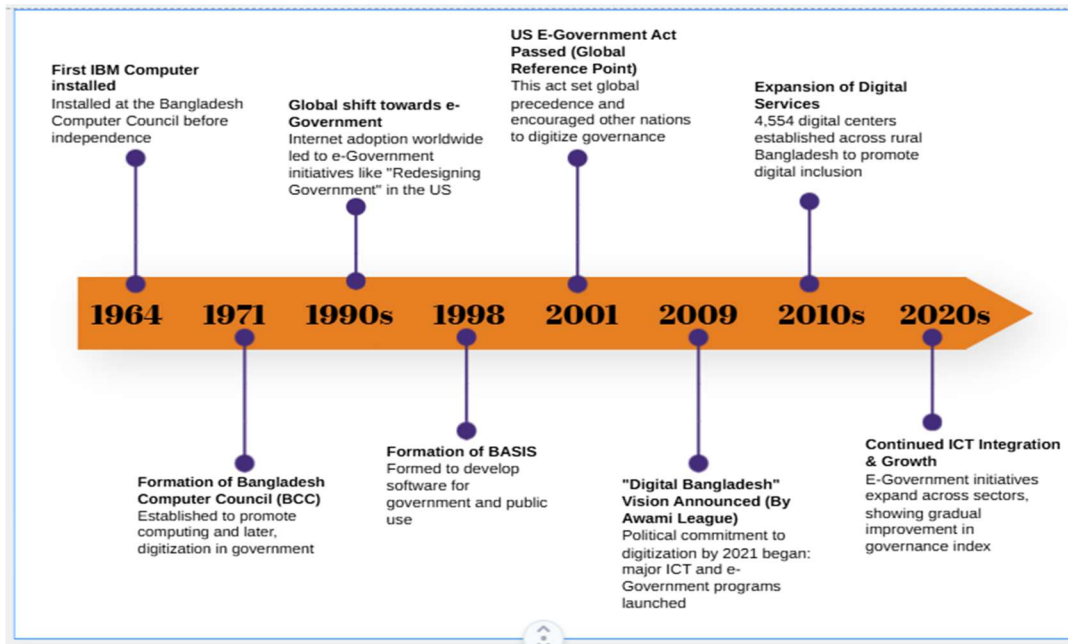


Figure 1. Development of E-Government Systems in Bangladesh (Sources: authors' own creation).

### 3. Literature Review

E-government has certainly transpired as a vital component of public administration, facilitating the digital delivery of governmental services through the websites and applications of ICT. Researchers have highlighted the benefits of e-governance through measuring scalability, reliability, cost-effectiveness, and performance [35]. These initiatives enhance administrative efficiencies as well as promote democratic governance by fostering people's engagement and participation in key policies and decision-making [36]

As digital documentation among communities is crucial in order to secure and promote the very idea of e-governance, it is fundamental to ensure information security and authorized access for particular sectors [37]. The prospects of e-governance for Bangladesh include increased data accessibility, which was limited previously [38], enhanced efficiency [37] and improved transparency that can promote accountability [40]. Data accessibility is considered a fundamental right, a priority in recent years by multiple countries [41], which is an obligation for civic contribution, any kind of inspection, and culpability [42]. Sarkar et al. in 2019 pointed out in their research about the importance of designing an improved transparent governmental website in Bangladesh with the use of ICT that could aid in eradicating poverty and corruption.

As transparency is an unavoidable element of reliability and responsibility, it is considered a vital part of good governance. If components that made the local government systems are crystal clear to the best of their ability with plans, budget, actions, and outcome, corruption get less shot [43].

A transparent e-government website ideally consists of an open government with policies that match the data and information requirements of netizens and businesses, which should be shared by public institutions. From a resource perspective, an open government is a public body that discloses

important details about most of the steps and decision-making operations it goes through [44]. In addition, transparency may be defined as unfettered access by the public to timely and reliable information on decisions and performance in the public sector [45].

In order to help the people, open government should implement public public-centered or user-centered approach [46]. The role of public managers and elected officials play in putting policies in place that encourage transparency at every governmental level is equally significant [47], [48]. The extent to which cultural transparency label, the government largely depends on how active these actors are to the information demand of businesses and for the citizens as well [49]. Also how proactive they are in creating information about public affairs available to the people without specific appeals, specially through the use of ICT's (i.e. preemptive disclosure). When supply and demand are balanced, the essential principles of open government policies- transparency, involvement, and cooperation – become means to acquire anticipated ends by contributing to the creation of public value by people and private regions [50].

Researchers like Mendez et al. (2024) showed that, public value assessment tool can be a facilitator, by helping to calculate the substantive welfare of transparent government initiatives. The limited research on the drivers of transparency largely concentrates on financial issues because of the lack of appropriate instruments to evaluate the broader transparency practices of local governments [52]. This prejudice has a very simple explanation: the idea of financial openness is simpler to implement.

A meta-analysis of this literature was conducted by Rodríguez Bolívar et al. (2013), who found that financial transparency levels are thoroughly impacted by characteristics including governments' "financial condition." Yet, these authors note that the research environment has a significant impact on the results as well. Recently, a growing number of writers have started examining the relationships with other socio-economic characteristics by utilizing the TI movement's indexes [54]. There are only a limited number of studies available regarding the assessment models that provide significant critical criticism [55]. Other researchers consider the entire transparency index, later adding the scores accumulated for each dimension of the transparency category separately, such as Sol (2013). Sometimes, external observations are gathered to assess the perception of the public at large in order to utilize these survey data for calculating transparency [57], [58]. They have attempted to unveil the determinants of their government using the strategy above. Administrative and financial capacity, along with ideology and even the characteristics of one's city, can influence the growth of dynamism in e-government. The authors utilize data collected from 850 employees working in finance, police stations, and development sectors across approximately 500 areas to investigate the factors of transparency and interactivity features of governmental websites [59].

The researchers have decided to term the website transparency as a function of openness and interactivity [60], [61], and it can evidently positively impact in increasing the participation of people in any kind of poll or decision-making activities by agencies, whether it be capacity-wise or technical, organizational control [62]. Thus, utilizing the full potential of the website technology. The openness of public websites can be distinguished as a part of transparency and interactivity [63]. It is connected to citizen partake in many government agencies for decision making, technical chores, organization control at low levels, and directly as well [64], [65]. As the textbook definition of transparency entails as "the online exposure of every single activity of the public sectors and their representatives to share with the citizen information that concerns them in a compact, accessible and punctual manner," it

has multiple boundaries. Foremost, the definition concentrates on data that is available online, which means people without internet access are unable to distinguish the potential biases. Secondly, although the definition describes the words as “compact, punctual and promptly accessible” the information gathered for the websites does not always allow the public to control accessible it. In another sense, and compared to the other existing research, the models used for investigating the overall transparency for the governmental websites can merely secure whether the data incorporated in its calculation exists in the official sites or not, the models most of the time cannot calibrate the accessibility or determine whether they are of high quality. Despite the confines, we are certain that, in this study, the data integrated has the potential to expose the private interests that collide with the collective interests and make the authorities responsible for their actions [66].

The subsequent part in this research goes on to examine the factors outlined in WAES, which stands for Website Attribute Evaluation System, with the aim of evaluating the transparency level of governmental websites in Bangladesh.

#### **4. Research Methodology**

This study evaluates the degree of transparency in Bangladesh's e-government systems, where there are in total of 39 ministries, using a content analysis methodology. Prior studies have extensively used content analysis to assess transparency across a range of platforms, such as websites, interviews, and official documents [20], [67], [68], [69], [70], [71]. The objective evaluation of written or electronic materials is made possible by the meticulous and reproducible research approach known as content analysis [72]. The two primary processes of content analysis in this study are (1) identifying the content to be assessed, which is often referred to as creating a content analysis assessment, and (2) assigning a score to the attributes that have been identified [20].

The WAES transparency index served as the model for the checklist items used in the current study. Previous research has utilized the WAES paradigm to assess the transparency of e-government and e-procurement systems in countries such as Brazil [17], Nepal [18], and Poland [19]. By employing this index, additional cross-national comparative research becomes feasible. Transparency and interactivity are the two main components of WAES, which was developed in 1996 by the (CyPRG), also known as the Cyberspace Policy Research Group. While interactivity evaluates how simple it is for consumers to access and interact with the information, transparency gauges how much information a government body makes available. Only the transparency aspect of WAES is the subject of this investigation [20].

Each of the five main components that make up the WAES transparency checklist represents a distinct facet of transparency. The degree to which a government organization actively participates in running and maintaining its website is assessed in the first category, Ownership. It evaluates if the agency provides a webmaster separate from the official government website, shows direct engagement in website administration, and makes it obvious who owns the content of the website. The public's ability to reach government representatives and their offices is the subject of the second category, Contact Information. It checks to see if the website offers email addresses for the webmaster and agency officials, central agency mailing addresses, and phone numbers for official communication. Additionally, it evaluates whether contact details for employees beyond top-level officials are made available, ensuring greater accessibility and communication between the government and the public.

Organizational Information, the third category, measures the comprehensiveness of information about the agency's operations and structure. This includes details on senior officials' experiences, the presence of a clear vision and mission statement, and information regarding government programs and activities. Furthermore, it assesses whether the organizational structure is displayed in a graphical format, if study papers, reports and guidelines are provided in a user-friendly manner. It also assesses whether archives and downloadable publications are accessible for public access.

The next category, Citizen Consequences, evaluates the extent to which government websites inform citizens about laws, policies, services, and processes that affect them. This includes clear documentation of regulations and policies, step-by-step instructions for completing government-related actions, and the availability of necessary government forms online. Additionally, the presence of an appeal process and contact information for an ombudsman ensures that citizens have a channel for grievances and legal recourse. Finally, Freshness assesses how frequently government websites update key information. It considers whether a "last updated" date is displayed on the main page or key subpages, ensuring that citizens receive accurate and timely information [73].

The second process for content analysis, a binary scoring systems was used to evaluate the transparency attributes on the e-government websites. Each transparency feature was scored as follows:

"1" (Present) – If the feature is available on the website.

"0" (Absent) – If the feature is missing from the website.

The scoring process was conducted in two rounds to enhance reliability and consistency. The first round of scoring was carried out in November 2024, followed by a second round two weeks later to validate initial findings and ensure scoring accuracy.

Hereafter, in addition to WAES, to systematically collect data from e-government websites, web scraping techniques were utilized. Web scraping allows for automated data extraction, ensuring efficiency and accuracy in gathering information. Python was used as the primary programming language, employing libraries such as BeautifulSoup and Scrapy for parsing and extracting website content. The web scraping process involved sending HTTP requests to the target websites using the requests library, retrieving and parsing HTML content with BeautifulSoup, and extracting transparency-related attributes based on the WAES framework. The extracted data was then stored in structured formats such as CSV and JSON for further analysis. Ethical considerations were maintained by respecting the robots.txt file of each website and ensuring minimal server load to prevent disruptions. In alignment with technical approaches such as those [74], this study employed BeautifulSoup for parsing and extracting HTML-based transparency attributes from government websites—following recommended practices like respecting robots.txt and managing request rates. After that, previously gathered manual data were cross-checked with the web scraping results to identify discrepancies and missing attributes. The content was categorized based on the WAES framework's transparency components, including ownership, contact information, organizational structure, citizen consequences, and freshness.

The collected data were analyzed using a frequency distribution. The percentage of transparency was calculated based on the number of features present in each category. The final transparency level was determined using a scoring range similar to that employed in previous WAES studies [73]. The findings provide insights into the extent of transparency within Bangladesh's e-government system and offer recommendations for improvement.

By applying WAES to Bangladesh’s e-government websites, this study provides a structured evaluation of transparency in public service delivery. The findings aim to guide policy recommendations for enhancing government openness and citizen engagement through digital platforms.

## 5. Findings and Discussion

### 5.1. Overall Transparency Level of E-Government Systems

Table 2 shows the overall results of the degree of transparency for individually of the five transparency categories. The measurement shown in Table 1 serves as the foundation for the results’ interpretation. As indicated in Table 2, the e-government systems disclosed 15.21 of the 23 WAES transparency disclosure items, yielding an overall openness level of 66.11%. As shown in Table 1, the interpreted score was awarded a four-star grade, indicating a high level of transparency.

Consequently, the outcome suggests that the authorities have met their obligations to individuals curious about the data made public through e-government. This results are in consistent with the prior studies of Malaysia [20] but higher than countries like Brazil [17], Poland [19] and Nepal [18]. This result is beneficial as it aligns with the conclusions of a related assessment.

Tables 4 through 8 present the results relevant to the degree of transparency in each of the five areas, allowing for a more detailed examination of the transparency of the e-government systems in Bangladesh.

**Table 1.** Star rating in MGPWA adapted for the level of transparency.

Star	Score range (%)	Level of transparency
5-star	80-100	Very high
4-star	60-69	High
3-star	40-59	Moderate
2-star	20-39	Low
1-star	1-19	Very low

**Table 2.** Overall results of transparency level for each category.

No	Category	No. of ministry	Total score	Average score	(%)
1	Ownership	39	79	2.03/3	67.52
2	Contact information	39	138	3.54/6	58.97
3	Organizational information	39	254	6.51/9	72.36
4	Citizen consequences	39	83	2.13/4	53.21
5	Freshness	39	39	1.00/1	100.00
Overall				15.21/23	66.11

Sources: authors’ own creation.

Table 3 presents the transparency scores for each ministry within the e-government system, highlighting variations in disclosure levels. The Ministry of Industries achieved the highest transparency score, with 20 out of 23 attributes disclosed, corresponding to an 86.96% transparency level. Following closely, the Ministry of Fisheries and Livestock, Ministry of Primary and Mass

Education, and Ministry of Public Administration each attained a score of 19/23 (82.61%), ranking second in transparency. Conversely, lower transparency scores were observed in ministries such as the Ministry of Local Government, Rural Development and Co-operatives and the Ministry of Law, Justice and Parliamentary Affairs, both scoring 10/23 (43.48%). The Ministry of Textiles and Jute and the Ministry of Social Welfare also ranked low, each with a transparency score of 11/23 (47.83%).

Overall, the findings indicate significant discrepancies in transparency levels across ministries. While some ministries have demonstrated a strong commitment to information disclosure, others require further improvements to enhance accessibility and accountability within the e-government systems.

**Table 3.** Overall results of transparency level for each ministry.

SL	Name of the ministry	Total Score	(%)	Rank
1	Ministry of Education	16/23	69.57	16
2	Ministry of Youth and Sports	15/23	65.22	19
3	Ministry of Women and Children Affairs	13/23	56.52	30
4	Ministry of Water Resources	17/23	73.91	10
5	Ministry of Textiles and Jute	11/23	47.83	36
6	Ministry of Social Welfare	11/23	47.83	36
7	Ministry of Shipping	14/23	60.87	25
8	Ministry of Science and Technology	12/23	52.17	32
9	Ministry of Road Transport and Bridges	18/23	78.26	5
10	Ministry of Religious Affairs	15/23	65.22	19
11	Ministry of Railways	16/23	69.57	16
12	Ministry of Power, Energy and Mineral Resources	16/23	69.57	16
13	Ministry of Posts, Telecommunications and Information Technology	18/23	78.26	5
14	Ministry of Planning	14/23	60.87	25
15	Ministry of Local Government, Rural Development and Co-operatives	10/23	43.48	38
16	Ministry of Law, Justice and Parliamentary Affairs	10/23	43.48	38
17	Ministry of Land	18/23	78.26	5
18	Ministry of Labour and Employment	15/23	65.22	19
19	Ministry of Liberation War Affairs	15/23	65.22	19
20	Ministry of Housing and Public Works	12/23	52.17	32
21	Ministry of Home Affairs	17/23	73.91	10
22	Ministry of Health and Family Welfare	14/23	60.87	25
23	Ministry of Foreign Affairs	12/23	52.17	32
24	Ministry of Food	17/23	73.91	10
25	Ministry of Fisheries and Livestock	19/23	82.61	2
26	Ministry of Finance	18/23	78.26	5
27	Ministry of Primary and Mass Education	19/23	82.61	2

28	Ministry of Information and Broadcasting	14/23	60.87	25
29	Ministry of Expatriates' Welfare and Overseas Employment	14/23	60.87	25
30	Ministry of Environment, Forest and Climate Change	18/23	78.26	5
31	Ministry of Public Administration	19/23	82.61	2
32	Ministry of Industries	20/23	86.96	1
33	Ministry of Disaster Management and Relief	17/23	73.91	10
34	Ministry of Defence	12/23	52.17	32
35	Ministry of Cultural Affairs	13/23	56.52	30
36	Ministry of Agriculture	15/23	65.22	19
37	Ministry of Chittagong Hill Tracts Affairs	17/23	73.91	10
38	Ministry of Civil Aviation and Tourism	17/23	73.91	10
39	Ministry of Commerce	15/23	65.22	19

Sources: authors' own creation.

### 5.2. Level of transparency Under Ownership Category

The transparency level under the ownership category is assessed based on three key indicators: agency involvement with the website, the presence of a different webmaster from the main government page, and clear indications that the agency itself owns the site content. As shown in Table 4, two out of the three indicators are present on the government websites, resulting in an overall transparency score of 2.03 out of 3, which equates to a transparency level of 67.52%. This result is aligned with the prior study of Malaysia [20]. The results indicate a high level of transparency in terms of agency involvement and content ownership. All 39 ministries demonstrate clear agency involvement with their respective websites, and all provide explicit tailoring that signifies their ownership of the site's content. However, only one ministry out of 39 offers a different webmaster from the main government page, contributing to the lower score in this specific criterion. This suggests that most government websites are centrally managed rather than independently maintained by individual agencies. The absence of a distinct webmaster could indicate a lack of decentralized control over content updates, which may impact transparency in terms of accountability and direct agency responsibility.

These findings highlight the importance of improving webmaster differentiation to enhance transparency further. Providing separate webmasters for each agency would strengthen content accountability and allow for more agency-specific oversight of website management. Despite this limitation, the overall transparency level for the ownership category remains relatively high, reflecting significant agency involvement in managing and maintaining their respective websites.

### 5.3. Level of Transparency Under Contact Information Category

The availability of different kinds of contact information on official websites was used to assess the degree of transparency for contact information. With a total score of 3.54 out of 6, this category has an average degree of transparency (58.97%). This result is slightly higher than the prior study of Malaysia [20]. "Provides central agency regular mailing addresses" and "provides addresses for sub-components within the agency," both of which had an average score of 0.85, were the highest-scoring

items. According to these results, the majority of government websites offer official addresses so that people can get in touch with them by regular mail.

On the other hand, things pertaining to direct communication are less transparent. The score of 0.82 for "Provides telephone numbers or any other mailing data of the office" suggests that although phone numbers are frequently provided, they might not always be complete. "Provides an email address to someone inside the agency in addition to the webmaster" along with "provides some kind of addresses for employees within the agency beyond top level" scored 0.41 and 0.51 respectively, indicating that government officials' direct contact information is not readily available. The item that received the lowest average score, "provides an email address to webmaster within the agency," with an average of just 0.10. This implies that not many organizations provide a specific webmaster contact, which could make it more difficult to ask questions about website upkeep and make it harder for consumers to get technical support. Overall, while most government websites provide basic mailing addresses, there is room for improvement in terms of direct and digital communication channels, such as email addresses and comprehensive employee contact details.

#### 5.4. Level of Transparency Under Organizational Information Category

**Table 4.** Level of transparency under ownership category.

No.	Item	Total score	Average score
1	Agency involvement with the site	39	1
2	Provides different webmaster from the main government page	1	0.03
3	Provides obvious tailoring indicating agency itself has ownership of the site content	39	1
	Total score		2.03

Sources: authors' own creation.

**Table 5.** Level of transparency under the contact information category.

No.	Item	Total score	Average score
1	Provides the central agency with regular mailing addresses	33	0.85
2	Provides telephone numbers or any other mailing data of the office	32	0.82
3	Provides an email address to the webmaster within the agency	4	0.10
4	Provides an e-mail address to someone inside the agency in addition to the webmaster	16	0.41
5	Provides some kind of addresses for employees within the agency beyond top level (e.g. shows a phonebook with position)	20	0.51
6	Provides addresses for sub-elements within the agency (can you write them a snail mail letter with this address?)	33	0.85
	Total score		3.54

Sources: authors' own creation.

The transparency level for organizational information was assessed based on nine key items related to agency details, activities, and structural transparency. Table 6 illustrates that this category's overall score is 6.51, which denotes a high degree of transparency (72.33%). This result is slightly lower than the prior study of Malaysia [20]. "Provides various activities of the agency" (0.97) and "downloadable publications are available" (0.92) are the items with the highest scores, indicating that the majority of government websites actively disseminate pertinent organizational information and make resources accessible to the general public.

Other high-scoring components that demonstrate the broad availability of high-level agency aims and leadership background include "provides details on senior officials' experience" (0.85) and "provides vision or mission statement of the agency" (0.90). The score of 0.82 for "Provides reports, research, laws, and regulations in an easily readable format on the screen" suggests that government websites generally preserve legal and procedural transparency.

However, there is potential for improvement in a few areas. The score of 0.77 for "Provides organizational structure in the graphic form" indicates that although organizational charts are provided, they might be made more easily accessible or clearer. The score of 0.62 for "Provides other issue-related government addresses" indicates that interagency contact information is somewhat available. "Provides Archives" (0.54) and "provides non-issue-related to other agency addresses" (0.13) are lower-scoring criteria that highlight gaps in interagency transparency and historical record accessibility.

Overall, the organizational information category demonstrates a relatively strong level of transparency, particularly in publishing agency activities, leadership details, and legal documents. However, improvements in archiving and inter-agency communication could further enhance transparency and public accessibility of government information.

**Table 6.** Level of transparency under the organizational information category.

No.	Item	Total score	Average score
1	Provides details on senior officials' experience	33	0.85
2	Provides vision or mission statement of the agency	35	0.90
3	Provides various activities of the agency	38	0.97
4	Provides other issue-related government addresses	24	0.62
5	Provides non-issue-related to other agency addresses	5	0.13
6	Provides organizational structure in the graphic form	30	0.77
7	Provides reports, research, laws, and regulations in an easily readable format on the screen	32	0.82
8	Provides Archives (is there a possibility of searching in the archives for bulletins, regulations, etc.)	21	0.54
9	Downloadable publications are available (such as internal publications of the office, such as protocols)	36	0.92
	Total score		6.51

Sources: authors' own creation.

**Table 7.** Level of transparency under Citizen consequences category

No.	Item	Total score	Average score
1	Provides the text of regulation/laws/agency research or in-depth explanations of requirements imposed on citizen resulting from agency activities	31	0.79
2	Provides instruction on how to complete these actions	27	0.69
3	Provides a form in graphics for screen capture or copy	0	0.00
4	Provides an appeal process for decisions or address of an ombudsman (complaint investigation)	25	0.64
Total			2.13

Sources: authors' own creation.

**Table 8.** Level of transparency under Freshness category.

No.	Item	Total score	Average score
1	Latest published "last updated" date (YYYY-MM-DD) on the main page, or if none, a key subordinate page, or 0 if no date listed on any of these pages	39	1
Total score			1

Sources: authors' own creation.

### 5.5. Level of Transparency Under the Citizen Consequences Category

Four important factors pertaining to regulatory clarity and citizen participation were used to evaluate the degree of transparency for citizen consequences. According to Table 7, this category's overall score is 2.13 out of 4, which denotes a moderate degree of transparency (53.25%). This result is contrasting with the prior study of Malaysia, where the study disclosing 100% of transparency in this category [20]. With a score of 0.79, "provides the text of regulation/laws/agency research or in-depth explanations of requirements imposed on citizens resulting from agency activities" was the item with the highest average score. This implies that the majority of government websites offer explanations and regulatory texts to assist citizens in understanding their responsibilities.

The score of 0.69 for "Provides instruction on how to complete these actions" suggests that, although some procedural information is accessible, it might not be all-inclusive across all agencies. With a score of 0.64, "Provides an appeal process for decisions or address of an ombudsman (complaint investigation)" indicates that while some grievance procedures exist, they are not always used. With a score of 0.00, the item that scored the lowest was "provides a form in graphics for screen capture or copy," indicating that there aren't any easily accessible graphical forms. Overall, while regulatory and procedural transparency is moderately maintained, the absence of downloadable or graphical forms limits ease of access for citizens. Enhancing the availability of these resources could improve transparency and user engagement.

### 5.6. Level of Transparency Under Freshness Category

The transparency level for freshness was assessed based on a single criterion: the presence of a "last updated" date on the main page or a key subordinate page. As shown in Table 8, the total score

for this category is 1.00, indicating full transparency (100%). This result is consistent with the prior study of Malaysia [20]. The availability of an updated timestamp ensures that users can determine the recency of the website's content. This is a crucial factor in maintaining trust and reliability in e-government services, as it provides assurance that the provided information is current and relevant. Ensuring that this practice is consistently maintained across all government websites will help sustain a high level of transparency in Bangladesh's e-government systems.

## **6. Implications of the Study and Conclusion**

### *6.1. Theoretical Implications*

This study makes a substantial contribution to the field of research on e-government transparency. It expands on the use of content analysis methods in evaluating government websites by utilizing the WAES to assess transparency in Bangladesh's e-government systems. The results demonstrate how useful WAES is for determining important transparency metrics, particularly in areas like organizational information, citizen consequences, and freshness. These findings align with prior research, who emphasize that structured and categorical assessment frameworks significantly enhance transparency evaluations across digital government platforms [75].

Additionally, this study reveals the nuanced nature of transparency by isolating specific deficiencies in areas such as ownership and contact information. This granular analysis helps extend theoretical models of e-government transparency by offering evidence that not all transparency dimensions evolve uniformly. These findings align with prior research, which emphasizes that transparency is multi-dimensional and must be assessed through both systemic indicators and citizen-perceived accessibility [76].

By refining these models, this research lays the groundwork for further cross-country comparisons using standardized frameworks like WAES, thus enhancing the comparability and generalizability of transparency findings globally.

### *6.2. Practical Implications*

The findings of this study have practical applications for improving transparency in Bangladesh's e-government systems. The overall transparency score of 66.11% reveals moderate progress but also indicates room for development in categories such as organizational information, contact information, and citizen consequences. Ministries like the Ministry of Local Government and the Ministry of Law, Justice, and Parliamentary Affairs scored lower than others and would benefit from targeted transparency reforms.

Consistent with recommendations made in prior research, this study highlights the importance of differentiated webmaster roles across ministries to improve accountability and update consistency. A decentralized content management structure could improve responsiveness and content quality [77]. Additionally, ensuring that email addresses, telephone numbers, and contact forms for key officials are prominently featured would increase public trust and accessibility. This approach aligns with previous research, which suggests that visible contact pathways enhance citizen satisfaction with digital services [78].

Improving citizen participation by simplifying access to downloadable forms, guidelines, and appeal procedures would further close the transparency gap. This reflects the "service transparency"

dimension, which links improved digital availability of documents to increased civic engagement and administrative efficiency [75].

### 6.3. Limitations and Future Scope

It is crucial to understand a number of limitations even if this study offers insightful information about the transparency of Bangladesh's e-government systems. First, the study ignores the usefulness or efficacy of the information offered on the websites in favor of concentrating only on transparency features. Future studies could examine the relationship between systems' trust or customer satisfaction and transparency.

Furthermore, this study is restricted to evaluating websites; it does not include other e-government service delivery methods like mobile applications or in-person encounters with the government. This analysis could be expanded to other platforms in future studies to offer a more comprehensive view of e-government transparency.

Finally, although this study provides information about the present level of e-government transparency in Bangladesh, it does not investigate the causes of the disparities between ministries that have been noted. It may be possible to create more specialized suggestions for enhancing transparency by looking into the institutional, political, and technical difficulties that each ministry faces.

**Funding:** This research received no external funding.

**Conflicts of Interest:** The authors declare no conflict of interest.

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(Executive Editor: Jin-mo Li)