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The impact of service quality on citizen engagement in e-government

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ABSTRACT

The purpose of this study is to examine how service quality affects citizens' participation in e-government. A descriptive approach was used, focusing on all citizens of the Hashemite Kingdom of Jordan. The study sample included 415 participants, chosen through random sampling. A questionnaire was developed to assess different aspects of service quality. The results showed that the impact of service quality on citizens' participation in e-government was moderate. The "ease of use" dimension received the highest score, while "responsiveness and communication" scored the lowest. There were no statistically significant differences in the ease of use dimension, but significant differences were found for the gender variable in the dimensions of efficiency, reliability, responsiveness, communication, and the overall tool, with women scoring higher. No statistically significant differences were found for age or educational qualifications across any of the dimensions studied.

1. Introduction

The process of digitization holds significant significance in our daily existence. Currently, 50% of the global population has access to the Internet, which has prompted governments to increase their presence in the digital realm. Governments worldwide are acknowledging the significance of E-Government (Ma and Wu, 2020). When government is designed and implemented effectively, it can enhance the efficiency of government service delivery, streamline compliance with regulations, foster citizen participation and trust in government, and generate cost savings for citizens, businesses, and the government (Faulkner et al., 2019).

The rapid integration of technology into daily life has transformed people's lifestyles, work practices, business operations, and government services. Citizens' perceptions of their government and their level of involvement in policy execution are typically influenced by factors such as the government's authority, reputation, performance, capacity, leadership motives, trust, and transparency (Malodia et al., 2021). Many governments worldwide are striving to incorporate ICT methods into their governance systems to effectively assist citizens and enhance their engagement in government activities and policies. The government's information exchange role has seen substantial changes through the adoption of e-government, which has great potential in the areas of big data, robotics, and artificial intelligence (Weigl et al., 2022).

The proliferation of the Internet is transforming how organizations provide services. E-government is distinguished by supporting the services to citizens by government websites (Pazmiño-Sarango et al., 2022). E-government services allow citizens to engage in transactions swiftly, easily, and effectively. In the past, citizens were required to engage directly with government agency staff in order to request services in the typical government context. Within the e-government framework, individuals can engage in transactions and interactions with government agencies' websites or information portals without the need for physical presence at the agencies' premises. This can be done by utilizing a personal computer or mobile device that is linked to the Internet (Hochstetter et al., 2021; Lindgren et al., 2021). Services of E-government provide advantages to citizens and government entities. Citizens can conveniently and effectively carry out transactions by using different smart (Lykidis et al., 2021). Moreover, e-government services facilitate time and cost savings for citizens. Citizens can avail themselves of a diverse array of online services offered by the government, obviating the need for telephonic or in-person communication with those entities. More precisely, online services such as

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vehicle registration, driving license issuance, tax preparation, passport application, business registration, insurance services, customs declaration, and election/voting services empower citizens to make informed choices and carry out necessary actions to fulfill their service requirements (Mensah et al., 2020). Services of e-government enable agencies to reduce expenditures related to investments in physical infrastructure and facilities, as citizens are not obligated to physically visit government offices to access requested services. Services of e-government enable government organizations to effectively engage with a wide range of individuals, regardless of their location, by leveraging smart devices (Zahid et al., 2022). This allows citizens to conveniently share information from any place and at any time (Pazmiño-Sarango et al., 2022).

This study aims to investigate how applying service quality dimensions influences citizens' participation in e-government and whether statistically significant differences exist in participant responses based on gender, educational level, and age at a 0.05 significance level. The paper is structured as follows: Section 2 reviews previous studies on the topic, Section 3 details the research methodology, Section 4 presents the experimental results, Section 5 discusses these findings, and Section 6 concludes with key insights and recommendations.

2. Literature review

This section reviews previous studies relevant to optimizing delivery services in e-government, focusing on quality management in different countries, such as Jordan. Alkraiji and Ameen (2022) examined how service quality, trust, and satisfaction influence citizen loyalty to e-government services. Their study surveyed 780 university students in Saudi Arabia (KSA) and found that service quality, government trust, e-government trust, and citizen satisfaction are key factors in encouraging citizen loyalty toward e-government services. Among these, trust in government had the strongest direct effect on citizen loyalty, while service quality most significantly influenced public loyalty. In contrast, citizen satisfaction had the least impact on loyalty to e-government services.

Zhu et al. (2022) examined the influence of the service on citizen involvement during a public emergency. Collected data originated from smart cities in China. Three significant and innovative findings are mentioned. Initially, the presence of top-notch information material, very dependable systems, and exceedingly responsive systems greatly enhance citizens' ongoing experiences but do not have a notable impact on citizens' immediate experiences. Furthermore, the immediate and ongoing experiences of individuals have a substantial and favorable impact on citizen participation. Furthermore, uninterrupted experiences have a complete mediation effect on the relationship between information content and citizen engagement, as well as between reliability and citizen engagement and between responsiveness and citizen engagement. Using this approach, smart city administrators may get insight into citizens' responses to public crises, ranging from initial stimulation to actual experience, as well as their behaviors in connection to smart city services.

Amosun et al. (2022) examined the influence of e-government utilization on citizen involvement during the COVID-19 pandemic in China with regard to the mediating effect of people's perception of the government. A model was suggested to elucidate the correlation between e-government utilization during the COVID-19 crisis and the mediating function that diverse views of government have in affecting citizens' degree of involvement. An online survey was undertaken to experimentally evaluate the study model, using 866 research participants consisting of Chinese residents from three major cities: Hefei, Shanghai, and Nanjing. The findings from the structural equation modeling analysis indicate that the utilization of e-government has a substantial and beneficial impact on people's impression of confidence in government, government transparency, and government reputation. However, it does not have a significant effect on citizens' involvement. However, a non-direct association was discovered in the mediation study. Furthermore, a notable correlation existed among the various perspectives on governance. Mediation research revealed that the various perspectives of government serve as mediators in the interaction between e-government use and citizens' involvement in the COVID-19 issue. The study revealed that the single mediation routes were the most effective mediators in determining individuals' feelings of confidence in government.

Owusu (2023) constructed a framework based on two models to investigate the influence of e-government systems on the provision of government services to the general public, which are revised Delone and Mclean (1992) IS success models. They used a quantitative approach to gather the data from 421 participants. The acquired data was then analyzed using the empirical technique of PLS-SEM. The results suggested that only e-government service quality and information quality did not have a substantial impact on system usage, whereas all other expected associations were confirmed. Thus, this research has provided us with empirical data that substantiates the notion that introducing e-government systems in a developing nation might really yield the desired advantages.

3. Proposed methodology

A descriptive approach was used because it aligns well with the study's objectives. The research population included all residents of the Irbid Governorate, with a study sample size of 415 individuals selected through random sampling. Table 1 provides details on the sample characteristics.

To develop the study's data collection tool, we consulted theoretical literature and relevant studies, such as Brown et al. (2020) on assessing service quality in educational contexts and Nilsson et al. (2003) on customer satisfaction in various service industries. The initial version of the tool contained 15 items across four dimensions of service quality, plus a section for demographic information like gender, age, and education level.

The tool, in its draft form, was presented to seven reviewers for feedback on the wording and relevance of each item. Based on their suggestions, three items were revised, as shown in Table 2. After establishing the face validity of the tool, construct validity was assessed to confirm the relevance of each item to its dimension. This involved applying the tool to an exploratory sample of 50 people outside the main study sample and calculating Pearson correlation coefficients for the items (Table 3). As shown in Table 3, no items were removed, with correlation coefficients ranging from 0.366 to 0.866 at a significance level of 0.000, indicating acceptable correlations for all items. Thus, the final tool comprised 15 items organized into four dimensions. To ensure reliability, the tool was applied to another exploratory sample of 50 individuals, again outside the main study sample, to calculate the Cronbach's alpha coefficient. The reliability score was 0.86, which is considered high and suitable for the study's objectives.

The study focused on analyzing how service quality impacts citizen participation in e-government, specifically within the Irbid Governorate, during March 2023. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize responses. Tests such as Cronbach's alpha, Pearson's correlation, the t-test for independent samples, and the three-way ANOVA were conducted. The necessary approvals for the study were obtained, and theoretical materials relevant to the research and variables were reviewed. The "Service Quality" tool was developed and tested for validity and reliability. Then, the tool was distributed to participants, data were entered into the Statistical Package for the Social Sciences (SPSS) software for analysis, and the study's questions were answered. Results were summarized, discussed, and used to inform recommendations.

A five-point Likert scale was used: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). Score ranges were defined as follows: low (1.00–2.33), moderate (2.34–3.67), and high (3.68–5.00).

Table 1: Frequencies and percentages of study individuals according to demographic variables

Variable	Category	Frequencies	Percentages
Sex	Male	159	38.3%
	Female	256	61.7%
Age	30 years and less	122	29.4%
	41-31	240	57.8%
	42 years and over	53	12.8%
Qualification	Secondary school or less	116	28.0%
	Diploma	88	21.2%
	Bachelor's	154	37.1%
	Postgraduate studies	57	13.7%
Total marks		415	100%

Table 2: Revisions suggested by arbitrators

Original wording	Revised wording
Access to services at all times	Easy access to services through the website
Use of the site by customers while inside or outside the company	Access available from both inside and outside government institutions
Ease of use of the site and clarity of its procedures	The site is characterized by ease of use and clarity of procedures

Table 3: Service quality correlation coefficients

Field	Paragraph number	Correlation coefficient with the field
Efficiency	1	0.825**
	2	0.448**
	3	0.500**
	4	0.681**
Dependability	5	0.866**
	6	0.366**
	7	0.512**
	8	0.858**
Ease of use	9	0.863**
	10	0.567**
	11	0.775**
Response and communication	1	0.788**
	2	0.660**
	4	0.815**

**: indicates statistically significant correlation ($p < 0.05$)

4. Experimental results

The first research question asked: What is the impact of applying service quality dimensions on citizens' participation in e-government? To answer this, the arithmetic means and standard deviations of the sample members' responses were calculated. As shown in Table 4, the overall arithmetic mean was 3.57. The means for individual dimensions ranged from 3.99 to 3.11, indicating high, medium, and low levels across dimensions. Specifically, the "ease of use" dimension had the highest mean, followed by

the "reliability" dimension, then "efficiency," with "responsiveness and communication" receiving the lowest score. For the "competency" dimension, arithmetic averages ranged from 4.09 to 3.32, indicating high and medium levels. Paragraph 4, which states, "Provides accurate and reliable information that can be trusted," received the highest average, while Paragraph 1, stating, "Provides access to the service via the Internet," had the lowest average.

Table 4: Means and deviations of the study tool items

No.	Item	Mean	Standard deviation	Rank	Level
	Efficiency				
1	Provides access to the service via the Internet	3.32	1.13	4	Medium
2	It provides comprehensive information about the services it contains and ways to obtain them	3.50	1.07	2	Medium
3	It provides the ability to obtain information at any time and with the least possible effort and costs	3.33	1.12	3	Medium
4	Provides accurate and reliable information that can be trusted	4.07	0.97	1	High
	Total marks	3.56	1.07		Medium
	Dependability				
5	Easy access to services through the website	3.83	1.16	1	High
6	Possibility of accessing the site from inside and outside government institutions	3.58	1.14	3	Medium
7	Ease of browsing the contents of the website	3.28	1.12	4	Medium
8	The government website adheres to the dates of service provision	3.79	1.03	2	High
	Total marks	3.62	1.11		Medium
	Ease of use				
9	It is easy to navigate through the data on the government website	3.84	1.02	3	High
10	It's easy to search and find information	3.93	0.96	2	High
11	The site is distinguished by ease of use and clarity of its procedures	4.22	0.89	1	High
	Total marks	3.99	0.96		High
	Response and communication				
12	The site provides the service of directly providing specialized solutions to the problems we face on the site	3.37	1.17	1	Medium
13	The government website provides quick responses	2.88	1.23	4	Low
14	Provides an automatic automated response service for various inquiries	3.15	1.19	2	Medium
15	The site provides active phone numbers for government institutions during official working hours	3.06	1.25	3	Medium
	Total marks	3.11	1.21		Medium
	The overall score for the instrument as a whole	3.57	1.09		Medium

Regarding the reliability of the "competence" dimension, averages ranged from 3.83 to 3.28, also reflecting high and medium levels. Paragraph 5, "Easy access to services through the website," achieved the highest average, while Paragraph 7, "Ease of browsing the contents of the website," had the lowest. For the stability of the "ease of use" dimension, averages ranged from 4.22 to 3.84, indicating high levels. Paragraph 11, "The site is distinguished by ease of use and clarity of its procedures," scored the highest, whereas Paragraph 9, "It is easy to navigate through the data on the government website," had the lowest score.

In the "responsiveness and communication" dimension, averages ranged from 3.37 to 2.88, showing high and medium levels. Paragraph 12, "The site provides the service of directly providing specialized solutions to the problems we face on the site," received the highest average, while Paragraph 13, "The government website provides quick responses," had the lowest. The second question was: Are there statistically significant differences at the 0.05 significance level between the responses of the study sample members according to variables like gender, educational qualification, and age?

First, for gender, an independent samples t-test was used. Table 5 indicates a difference in the averages of service quality dimensions and their domains. The t-test results in Table 6 show no statistically significant differences (p = 0.00) between gender and the "ease of use" dimension, with a t-value of -0.593. However, there were differences in the "competence," "reliability," and "responsiveness and communication" dimensions, all favoring females, who had the highest average scores in all tool dimensions.

Second, regarding educational qualification and age, a two-way analysis of variance (ANOVA) was applied, as shown in Table 7. Results indicate no statistically significant differences (p = 0.00) for educational qualification or age across all dimensions, including "efficiency," "dependability," "ease of use," and "responsiveness and communication."

Table 5: Arithmetic means and standard deviations for the variable (gender)

The dimension	Category	Mean	Standard deviation
Efficiency	Male	3.49	0.89
	Female	3.60	0.74
Dependability	Male	3.61	0.90
	Female	3.63	0.75
Ease of use	Male	3.96	0.84
	Female	4.02	0.79
Response and communication	Male	3.00	1.05
	Female	3.19	0.89
The tool as a whole	Male	13.07	2.91
	Female	13.43	2.41

Table 6: Results of applying the (Independent Sample T-test) test according to the gender variable

The dimension	T-value	Degrees of freedom	P-value
Efficiency	-1.385	413	0.010
Dependability	-0.226	413	0.000
Ease of use	-0.593	413	0.608
Response and communication	-1.938	413	0.000
The tool as a whole	-1.346	413	0.000

Table 7: Two-way analysis of variance according to educational qualification and age

Source of variance	Domains	Sum of squares	Degrees of freedom	Mean squares	F-statistic	P-value
Educational qualification	Efficiency	2.621	3	0.874	0.084	0.969
	Dependability	40.530	3	13.510	1.276	0.282
	Ease of use	17.957	3	5.986	1.022	0.382
	Response and communication	116.575	3	38.858	2.659	0.048
	The tool as a whole	396.736	3	132.242	1.212	0.305
Age	Efficiency	29.994	2	14.997	1.446	0.237
	Dependability	25.741	2	12.870	1.214	0.298
	Ease of use	27.413	2	13.706	2.356	0.096
	Response and communication	56.122	2	28.061	1.906	0.150
	The tool as a whole	424.447	2	212.224	1.951	0.144

5. Discussion

The study aimed to examine the impact of service quality on citizens' participation in e-government. The overall average score for the service quality tool across all dimensions was 3.57, with the "ease of use" dimension receiving the highest score, followed by "reliability," "efficiency," and lastly, "responsiveness and communication."

These findings suggest that e-government positively facilitates citizens' access to services, saving them time and effort. E-government enables individuals to complete transactions, book tickets, request specific information, or fulfill other governmental tasks at any time and from any location. This convenience may be attributed to the government's provision of user-friendly interfaces and clear procedures on its websites, allowing citizens to easily understand steps, procedures, and services. These findings align with Malodia et al. (2021), who highlighted the impact of service quality on citizen participation, as well as with Amosun et al. (2022), who showed a significant effect of e-government on citizen engagement.

The study also revealed no statistically significant differences in the "ease of use" dimension between genders, indicating that both men and women similarly recognize the ease of use of e-government services. However, statistically significant differences were found for gender in the dimensions of "efficiency," "reliability," and "responsiveness and communication," with scores favoring females. This may be due to women's higher awareness of and adherence to standards of competence and trust, along with a stronger emphasis on communication and responsiveness.

Additionally, no statistically significant differences were found for the variables of age and educational qualification across all dimensions. This outcome suggests that participants, regardless of their educational level or age, similarly recognize the impact of service quality on citizen participation, likely because they all receive the same level of service quality.

6. Conclusion and recommendations

The study explored how service quality affects citizens' participation in e-government based on a sample of 415 citizens from Jordan. Findings showed a moderate impact on service quality, with "ease of use" rated highest and "responsiveness and communication" lowest. Gender differences were significant in dimensions such as "efficiency," "reliability," and "responsiveness and communication," but not in "ease of use"; age and educational qualification showed no significant differences across any dimension. Recommendations include raising citizen awareness about service quality through brochures, improving quality dimensions, offering courses on e-government processes, developing AI-powered chat and robotic assistance, implementing single sign-on systems, and enhancing digital signature services.

Compliance with ethical standards

Ethical considerations

This study was conducted in compliance with ethical research standards. All participants provided informed consent before participating, and their responses were anonymized to protect confidentiality. The study did not involve any procedures that could pose risks to participants. Data collected were used exclusively for research purposes and handled in accordance with data protection regulations.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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