



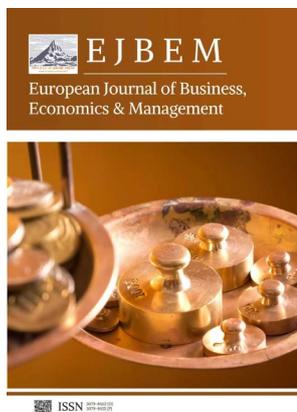
Article **Open Access**

Optimization Suggestions for Shandong Province's Digital Government Public Service Platform

Hehang Yin ^{1,*}

¹ Emilio Aguinaldo College, Manila, Philippines

* Correspondence: Hehang Yin, Emilio Aguinaldo College, Manila, Philippines



Abstract: This study examines the performance of Shandong Province's Digital Government Public Service Platform and proposes targeted optimization strategies based on survey data from 300 users. The findings indicate moderate satisfaction, with process efficiency and system stability performing better than data sharing and personalization. No significant differences were observed across demographic variables, demonstrating a consistent and inclusive user experience. Correlation analysis shows that improved usability, stability, and cross-department integration are associated with fewer reported issues. Overall, the platform is functional and widely accessible but still requires enhancements in intelligent service response, unified data sharing, interface usability, and feedback mechanisms. Strengthening interoperability and user-centered design will support the development of a more efficient, responsive, and citizen-oriented digital governance model in Shandong Province.

Keywords: optimization digital government; public service platform; optimization strategies; service efficiency

Received: 02 November 2025

Revised: 11 November 2025

Accepted: 24 November 2025

Published: 01 December 2025



Copyright: © 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

In the era of global digital transformation, digital government plays a crucial role in enhancing governance capacity and modernizing public services. Shandong Province, a key economic and populous region in China, has made notable progress through platforms such as "Love Shandong," which serves millions of users. Despite these advances, challenges remain in areas like data sharing, cross-department collaboration, and inclusiveness, especially as public demands become more diverse and personalized. This study aims to optimize Shandong's digital government public service platform to improve service quality and user experience by integrating theories of new public service, holistic governance, and service science [1]. These provide a comprehensive framework to analyze current performance and propose targeted strategies for transformation from a functional system to an excellent platform, offering valuable insights for digital governance nationwide [2,3].

China's emphasis on digital government, reinforced by national policies and directives, underpins Shandong's efforts to modernize governance systems and enhance public services. With over 116 million registered users and millions of daily active users, platforms like "Love Shandong" have significantly improved convenience but still require enhancements to meet evolving user expectations [4]. The study's research framework (Figure 1) examines respondent demographics, platform performance across five constructs-functional design, process efficiency, data sharing, usability, and technical

stability-and explores existing problems and user needs. It also analyzes demographic differences and their relationship to platform evaluations, ultimately guiding practical optimization strategies.

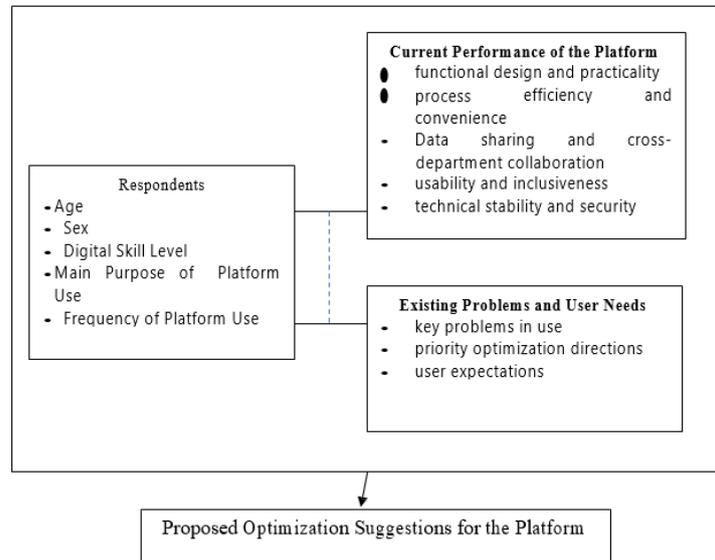


Figure 1. Research Paradigm.

2. Methodology

This study utilized a mixed research design, combining literature research, case analysis, and surveys. J. W. Creswell and J. D. Creswell explain that mixed research integrates both quantitative and qualitative methods, which is suitable for exploring complex social phenomena like platform optimization [5]. The goal is to assess Shandong Province's Digital Government Public Service Platform's performance, existing problems, and user needs, and propose optimization strategies.

The study was conducted in Shandong Province, focusing on the "Love Shandong" APP and relevant government departments.

A self-designed questionnaire, developed with the researcher's adviser, was used to assess platform performance in areas such as functional design, efficiency, data sharing, usability, and security, as well as to identify user issues and needs.

A total of 300 users and purposively selected government and technical personnel participated. The survey consisted of three parts: demographics, platform performance assessment, and feedback on issues, optimization priorities, and user expectations. Departmental approval was required for data collection.

The following rating scales were used by respondents, as shown in Table 1:

Table 1. Rating Scales for Respondent Assessments.

Scale	Range	Degree
4	3.51-4.00	Strongly Agree (Highly Evident)
3	2.51-3.50	Agree (Evident)
2	1.51-2.50	Disagree (Slightly Evident)
1	1.00-1.50	Strongly Disagree (Not Evident)

Statistical Methods:

- 1) Weighted Mean: To calculate the average score of respondents' assessments, as shown in Table 1.
- 2) ANOVA: To test for demographic differences in assessments.

- 3) Pearson's r: To examine correlations between platform performance and user feedback.

Ethical Considerations:

Informed consent was obtained, anonymity was ensured, and data were securely stored. Participants could withdraw at any time without consequence, ensuring the integrity of the research.

3. Results and Analysis

The demographic profile of respondents was assessed in terms of age, sex, digital skill level (Basic, Intermediate, Advanced), main purpose of platform use, and frequency of platform use. These variables are shown in Table 2.

Table 2. Respondents' Demographic Profile.

Indicators	Frequency (N)	Percentage (%)
Age		
1 - 18-30 years old	71	23.7%
2 - 31-45 years old	82	27.3%
3 - 46-60 years old	70	23.3%
4 - 60 years old or older	77	25.7%
Total	300	100%
Sex		
1 - Male	169	56.3%
2 - Female	131	43.7%
Total	300	100%
Digital Skill Level		
1 - Basic	100	33.3%
2 - Intermediate	109	36.3%
3 - Advanced	91	30.3%
Total	300	100%
Main Purpose of Platform Use		
1 - Administrative procedures	82	27.3%
2 - Information inquiry	68	22.7%
3 - Public services	65	21.7%
4 - Other	85	28.3%
Total	300	100%
Frequency of Platform Use		
1 - Rarely	73	24.3%
2 - Occasionally	72	24.0%
3 - Frequently	78	26.0%
4 - Very frequently	77	25.7%
Total	300	100%

This study surveyed 300 respondents, offering a balanced demographic profile of users. Age groups were fairly evenly represented-18-30 (23.7%), 31-45 (27.3%), 46-60 (23.3%), and 60+ (25.7%)-indicating strong engagement across generations, including older adults. Gender distribution was slightly male-dominant (56.3% men, 43.7% women), possibly reflecting user base characteristics or occupational factors. Digital skill levels spanned from basic (33.3%) to intermediate (36.3%) and advanced (30.3%), suggesting the platform attracts users with varied competencies and emphasizing the need for interfaces that accommodate different skill levels through tailored guidance and support.

Regarding platform usage, respondents reported diverse purposes: "Other" (28.3%) was most common, followed by administrative procedures (27.3%), information inquiry

(22.7%), and public services like medical registration or transportation (21.7%). The prominence of the "Other" category highlights the need for refined service classifications to better capture actual user activities. Frequency of use was nearly evenly split, with frequent and very frequent users combined accounting for 51.7%, and rare and occasional users making up 48.3%, indicating that the platform must effectively serve both heavy and light users.

The evaluation of the platform's current performance focused on five aspects: functional design and practicality, process efficiency and convenience, data sharing and cross-department collaboration, usability and inclusiveness, and technical stability and security, as detailed in Table 3.

Table 3. Assessment of the Respondents on the Current Performance of the Platform in Terms of Functional Design and Practicality.

Indicator	WM	SD	QD	VI	Rank
The platform provides access to most essential public services I need.	2.99	0.84	Agree	Evident	3
The service categories are logically organized and easy to understand.	3.03	0.83	Agree	Evident	1
High-frequency services are clearly accessible from the homepage.	2.98	0.82	Agree	Evident	4
The interface design allows me to quickly locate the service I want.	2.98	0.85	Agree	Evident	4
The information displayed on each page is relevant and easy to comprehend.	2.99	0.81	Agree	Evident	2
The layout design promotes an efficient and practical user experience.	2.93	0.85	Agree	Evident	6
Overall Mean	2.98	0.34	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

Table 3 shows that respondents rated the platform's functional design and practicality as "Evident," with a mean score of 2.98 (SD = 0.34). Users generally find the platform logically structured and visually clear, though improvements are possible. The statement "The service categories are logically organized and easy to understand" received the highest mean (M = 3.03), indicating users appreciate the clear grouping and labeling of services, which helps reduce confusion and facilitates task completion. "The information displayed on each page is relevant and easy to comprehend" also scored well (M = 2.99), highlighting the importance of clear communication in preventing errors. However, "The layout design promotes an efficient and practical user experience" had the lowest mean (M = 2.93), suggesting some users find the layout text-heavy or visually cluttered, which can hinder natural interaction.

The narrow range of scores (2.93 to 3.03) suggests the platform's design is consistent but lacks distinctiveness or strong appeal. While predictability benefits usability, enhancements in aesthetics, navigation feedback, and visual ergonomics could improve user confidence and satisfaction. Personalizing dashboard layouts or refining interface elements may elevate the user experience beyond basic functionality.

Table 4 reveals that process efficiency and convenience received the highest overall mean (3.02, SD = 0.34), reflecting moderate user satisfaction. Respondents agree that the platform reduces bureaucratic delays, accelerates feedback, and saves time compared to traditional paper-based procedures.

Table 4. Assessment of the Respondents on the Current Performance of the Platform in Terms of Process Efficiency and Convenience.

Indicator	WM	SD	QD	VI	Rank
The online service process minimizes unnecessary steps.	3.02	0.82	Agree	Evident	3
I rarely need to re-upload or resubmit the same documents.	2.90	0.81	Agree	Evident	6
The transition between online and offline procedures is smooth.	3.11	0.80	Agree	Evident	1
Service approval and feedback are delivered promptly.	3.02	0.79	Agree	Evident	3
The system provides clear instructions during each process stage.	3.07	0.83	Agree	Evident	2
The overall workflow saves time and effort compared to traditional methods.	3.01	0.82	Agree	Evident	5
Overall Mean	3.02	0.34	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

The statement "The transition between online and offline procedures is smooth" received the highest mean ($M = 3.11$), indicating relatively good integration between digital systems and in-person services. This suggests effective coordination between government agencies and local offices where physical verification or document collection is required. The next highest rating, "The system provides clear instructions during each process stage" ($M = 3.07$), highlights the value of step-by-step guidance in reducing user confusion, especially for less tech-savvy individuals.

However, the lowest score, "I rarely need to re-upload or resubmit the same documents" ($M = 2.90$), points to ongoing backend issues. Despite improvements in front-end usability, internal data synchronization between departments remains problematic, causing redundant requests that frustrate users.

These results indicate that while the platform offers functional speed and some integration, full procedural fluidity is not yet achieved. Users appreciate the time-saving benefits but still encounter minor disruptions likely due to inconsistent database integration and uneven adoption of digital standards. Process efficiency is a relative strength but not fully optimized.

Table 5 shows that data sharing and cross-department collaboration scored the lowest overall mean among the five dimensions at 2.97 ($SD = 0.36$). Though users acknowledge some interdepartmental coordination, they also perceive notable inconsistencies and room for improvement in this area.

Table 5. Assessment of the Respondents on the Current Performance of the Platform in Terms of Data Sharing and Cross-Department Collaboration.

Indicator	WM	SD	QD	VI	Rank
My personal data is shared accurately among relevant departments.	2.92	0.81	Agree	Evident	5
The system avoids repeated requests for the same information.	3.03	0.82	Agree	Evident	1
Data integration among departments ensures faster approval times.	2.99	0.83	Agree	Evident	3
Shared information is updated promptly and accurately.	3.04	0.82	Agree	Evident	2
There are few inconsistencies when dealing with different departments.	2.90	0.80	Agree	Evident	6

The cross-department coordination helps improve the quality of services.	2.95	0.80	Agree	Evident	4
Overall Mean	2.97	0.36	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

Table 5 shows moderate success in reducing redundant data requests (M = 3.03), indicating some data sharing across departments. However, inconsistencies remain (M = 2.90), reflecting delays and fragmentation typical of multi-agency systems. Users also feel that shared information is not always updated promptly (M = 3.04), highlighting coordination challenges beyond interface issues. Overall, the platform's data integration is functional but limited by bureaucratic barriers, requiring stronger interoperability and centralized data management.

Table 6 rates usability and inclusiveness highly (M = 3.01). The visual design supports accessibility well (M = 3.07), with clear, consistent layouts aiding user understanding. This simplicity benefits engagement, addressing common issues of cluttered public platforms.

Table 6. Assessment of the Respondents on the Current Performance of the Platform in Terms of Usability and Inclusiveness.

Indicator	WM	SD	QD	VI	Rank
The platform can be used effectively by people with limited technical skills.	3.00	0.82	Agree	Evident	4
Access channels (mobile, web, app) are diverse and stable.	3.05	0.80	Agree	Evident	2
The interface is friendly to users with disabilities or special needs.	2.97	0.81	Agree	Evident	5
Troubleshooting instructions are easy to follow when problems occur.	3.01	0.82	Agree	Evident	3
The visual design (font, color, layout) supports accessibility.	3.07	0.83	Agree	Evident	1
The overall usability meets the needs of a wide range of citizens.	2.94	0.82	Agree	Evident	6
Overall Mean	3.01	0.32	Agree	Evident	

"Access channels (mobile, web, app) are diverse and stable" scored high (M = 3.05), showing the platform supports various devices well. However, "The interface is friendly to users with disabilities or special needs" rated lower (M = 2.97), indicating room for improvement in accessibility features like screen readers or high-contrast modes.

"Troubleshooting instructions are easy to follow" (M = 3.01) suggests basic help is available but lacks more intuitive, user-friendly guidance. Overall, usability is solid but not exceptional, with a narrow score range (2.94-3.07). The platform meets general needs but falls short on full inclusiveness, especially for users with disabilities or older adults. Enhancing accessibility and targeted testing could improve this.

Table 7 shows reliability and data protection rated at 3.00 (SD = 0.33), reflecting user trust in system stability, though occasional technical issues still exist.

Table 7. Assessment of the Respondents on the Current Performance of the Platform in Terms of Technical Stability and Security.

Indicator	WM	SD	QD	VI	Rank
The platform operates smoothly without frequent crashes.	2.93	0.79	Agree	Evident	5
System downtime or errors occur rarely.	2.98	0.80	Agree	Evident	3
The platform effectively protects users' personal and confidential data.	3.05	0.81	Agree	Evident	2

Security measures (e.g., verification codes, encryption) are clear and reliable.	3.07	0.81	Agree Evident	1
Technical updates are regularly implemented to maintain performance.	3.02	0.81	Agree Evident	4
I feel confident in the system's ability to protect my digital transactions.	2.95	0.81	Agree Evident	6
Overall Mean	3.00	0.33	Agree Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

The statement "Security measures (e.g., verification codes, encryption) are clear and reliable" scored highest (M = 3.07), indicating users recognize strong security compliance, including visible two-factor authentication and encryption protocols. "The platform effectively protects users' personal and confidential data" followed closely (M = 3.05), showing general reassurance about data handling. However, "The platform operates smoothly without frequent crashes" received a lower score (M = 2.93), suggesting occasional interruptions that may affect trust, especially during critical transactions.

"Technical updates are regularly implemented" (M = 3.02) indicates user awareness of maintenance, but lack of clear communication may cause updates to be seen as disruptions rather than improvements. Overall, Table 7 depicts a secure yet sometimes unstable platform. Enhancing transparency through update notifications or reports could build greater user confidence, emphasizing dependability beyond technical glitches.

Table 8 summarizes all five performance dimensions with an overall mean of 2.99 (SD = 0.14), reflecting general satisfaction. Process Efficiency and Convenience leads (3.02), followed by Usability and Inclusiveness (3.01) and Technical Stability and Security (3.00), indicating efficiency, usability, and security are strengths, though further refinement is needed to achieve excellence.

Table 8. Summary Assessment of the Respondents on the Current Performance of the Platform.

Construct	WM	SD	QD	VI	Rank
Functional Design and Practicality	2.98	0.34	Agree	Evident	4
Process Efficiency and Convenience	3.02	0.34	Agree	Evident	2
Data Sharing and Cross-Department Collaboration	2.97	0.36	Agree	Evident	5
Usability and Inclusiveness	3.01	0.32	Agree	Evident	3
Technical Stability and Security	3.00	0.33	Agree	Evident	1
Overall Mean	2.99	0.14	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

Data Sharing and Cross-Department Collaboration recorded the lowest mean score (2.97), indicating that while users recognize some integration efforts, departmental fragmentation remains. The small range between the highest and lowest means (0.05) and narrow standard deviations (0.32-0.36) suggest consistent user perceptions, reflecting a platform that is reliable for routine tasks but not yet optimized for complex, cross-departmental functions.

These results show cautious approval of Shandong's Digital Government Public Service Platform. Users appreciate its logical design, efficiency, and security but remain aware of coordination and accessibility gaps. To progress from "evident" to "highly evident," future improvements should target real-time data integration, greater inclusivity, and clearer communication about updates.

Table 9 compares male and female respondents' platform performance assessments, revealing no significant differences across all constructs (p > 0.05). Mean scores between 2.96 and 3.02 confirm a shared, uniform user experience regardless of gender.

Table 9. Test of Difference in the Assessment of the Respondents on the Current Performance of the Platform in terms of Sex.

Indicator	Sex	Mean	F	Sig.	Decision on Ho	Interpretation
Functional Design and Practicality	Male	3.00	0.64	0.43	Fail to Reject	Not Significant
	Female	2.96				
Process Efficiency and Convenience	Male	3.02	0.01	0.91	Fail to Reject	Not Significant
	Female	3.01				
Data Sharing and Cross-Department Collaboration	Male	2.97	0.65	0.42	Fail to Reject	Not Significant
	Female	2.98				
Usability and Inclusiveness	Male	3.01	0.39	0.53	Fail to Reject	Not Significant
	Female	3.01				
Technical Stability and Security	Male	2.99	0.44	0.51	Fail to Reject	Not Significant
	Female	3.01				
Overall Performance	Male	3.00	0.67	0.42	Fail to Reject	Not Significant

Male respondents reported slightly higher means in Process Efficiency ($M = 3.02$) and Overall Performance ($M = 3.00$), while females rated Technical Stability and Security slightly higher ($M = 3.01$). However, these differences are statistically insignificant, indicating the platform offers a gender-neutral experience. Both male and female users encounter similar usability, reliability, and security levels, reflecting an inclusive design that does not favor one gender.

The data suggest gender does not affect user satisfaction or perception of platform functionality, highlighting an equitable digital environment with comparable technical and procedural conditions for all users.

Table 10 compares four age groups, revealing a significant difference only in Functional Design and Practicality ($F = 4.30$, $p = 0.01$). Respondents aged 31-45 rated this highest ($M = 3.09$), while the youngest group (18-30) gave the lowest rating ($M = 2.91$). This may reflect varied familiarity with digital platforms, as middle-aged users-often managing both work and personal administrative tasks-appreciate the organized structure more than younger users, who might prefer faster, more interactive interfaces.

Table 10. Test of Difference in the Assessment of the Respondents on the Current Performance of the Platform in terms of Age.

Indicator	Age	Mean	F	Sig.	Decision on Ho	Interpretation
Functional Design and Practicality	18-30	2.91	4.30	0.01	Reject Ho	Significant
	31-45	3.09				
	46-60	2.94				
	60+	2.98				
Process Efficiency and Convenience	18-30	3.05	1.34	0.26	Fail to Reject	Not Significant
	31-45	2.96				
	46-60	3.01				
Data Sharing and Cross-Department Collaboration	18-30	3.02	0.95	0.42	Fail to Reject	Not Significant
	31-45	2.93				
	46-60	2.99				
	60+	2.96				
Usability and Inclusiveness	18-30	3.06	1.52	0.21	Fail to Reject	Not Significant
	31-45	3.03				
	46-60	2.96				

	60+	2.98				
Technical Stability and Security	18-30	2.99	0.24	0.87	Fail to Reject	Not Significant
	31-45	2.98				
	46-60	3.00				
	60+	3.02				
Overall Performance	18-30	3.00	0.36	0.79	Fail to Reject	Not Significant
	31-45	3.00				
	46-60	2.98				
	60+	3.00				

Other constructs—Process Efficiency, Data Sharing, Usability, and Technical Stability—showed no significant differences ($p > 0.05$), with mean scores hovering around 3.00. This suggests that aside from minor design preferences, age has little impact on perceptions of efficiency or reliability. Notably, respondents aged 60 and above rated constructs like Technical Stability and Usability near the average, indicating successful adaptation by older users, likely due to effective efforts to simplify digital access for less tech-savvy individuals.

Overall, while visual and structural design preferences vary slightly by age, the general user experience is consistent across generations. The platform is broadly user-friendly, though more intuitive visual layouts could further enhance engagement for younger users.

Table 11 compares respondents by self-assessed digital skill levels, revealing significant differences in Data Sharing and Cross-Department Collaboration ($F = 5.22, p = 0.01$) and Technical Stability and Security ($F = 3.53, p = 0.03$). Those with intermediate skills rated these constructs higher ($M = 3.05$ and $M = 3.02$, respectively), suggesting greater comfort and recognition of the platform's technical strengths within this group.

Table 11. Test of Difference in the Assessment of the Respondents on the Current Performance of the Platform in Terms of Digital Skill Level.

Indicator	Digital Skill Level	Mean	F	Sig.	Decision on Ho	Interpretation
Functional Design and Practicality	Basic	3.03	1.41	0.25		
	Intermediate	2.95			Fail to Reject	Not Significant
	Advanced	2.97				
Process Efficiency and Convenience	Basic	2.99	0.86	0.43	Fail to Reject	Not Significant
	Intermediate	3.05				
	Advanced	3.01				
Data Sharing and Cross-Department Collaboration	Basic	2.89	5.22	0.01	Reject Ho	Significant
	Intermediate	3.05				
	Advanced	2.97				
Usability and Inclusiveness	Basic	2.99	0.55	0.58		
	Intermediate	3.00			Fail to Reject	Not Significant
	Advanced	3.03				
Technical Stability and Security	Basic	3.05	3.53	0.03	Reject Ho	Significant
	Intermediate	3.02				
	Advanced	2.92				
Overall Performance	Basic	2.99	1.54	0.22	Fail to Reject	Not Significant

Respondents with basic digital skills rated Data Sharing the lowest ($M = 2.89$), likely reflecting challenges in understanding how the platform integrates information across departments. Conversely, advanced users gave a lower rating for Technical Stability ($M = 2.92$), possibly due to higher expectations and greater awareness of issues like latency, interface glitches, or downtime.

For other constructs-Functional Design, Process Efficiency, Usability, and Overall Performance-differences were not statistically significant ($p > 0.05$), with all user groups rating the platform positively, averaging around 3.00.

These results suggest that while digital literacy affects perceptions of certain technical and collaborative aspects, it does not significantly impact overall satisfaction. Enhancing user education and tutorials could help users with basic skills better navigate the platform's features.

Table 12 shows no significant differences in platform assessments based on the primary purpose of use (Administrative Procedures, Information Inquiry, Public Services, Other), with all p-values above 0.05 and consistent decisions to "Fail to Reject H_0 ." This indicates a largely uniform user experience regardless of the reason for accessing the platform.

Table 12. Test of Difference in the Assessment of the Respondents on the Current Performance of the Platform in Terms of Main Purpose of Platform Use.

Indicator	Main Purpose	Mean	F	Sig.	Decision on H_0	Interpretation
Functional Design and Practicality	Administrative procedures	2.91	2.08	0.10	Fail to Reject	Not Significant
	Information inquiry	2.99				
	Public services	3.02				
	Other	3.02				
Process Efficiency and Convenience	Administrative procedures	3.04	1.25	0.29	Fail to Reject	Not Significant
	Information inquiry	2.98				
	Public services	3.08				
	Other	2.99				
Data Sharing and Cross-Department Collaboration	Administrative procedures	2.99	0.51	0.68	Fail to Reject	Not Significant
	Information inquiry	3.01				
	Public services	2.96				
	Other	2.94				
Usability and Inclusiveness	Administrative procedures	3.00	0.65	0.58	Fail to Reject	Not Significant
	Information inquiry	3.05				
	Public services	3.01				
	Other	2.97				
Technical Stability and Security	Administrative procedures	3.04	1.43	0.23	Fail to Reject	Not Significant
	Information inquiry	3.00				
	Public services	2.93				
	Other	3.01				
Overall Performance	Administrative procedures	3.00	0.22	0.88	Fail to Reject	Not Significant
	Information inquiry	3.00				

Public services	3.00
Other	2.99

Users accessing the platform for Public Services rated Process Efficiency highest (M = 3.08), reflecting satisfaction with streamlined citizen transactions, while those using it for Administrative Procedures gave slightly lower ratings in Functional Design (M = 2.91), possibly due to the complexity of document-heavy processes requiring backend coordination. Overall, mean scores cluster around 3.00 across constructs, indicating consistent perceptions of usability regardless of use purpose. This suggests that the platform's interface and navigation are standardized, delivering a uniform experience for different user types. These findings highlight the platform's versatility in supporting diverse user needs without compromising usability; however, tailoring interface features—such as more intuitive menus for administrative tasks or simplified workflows for service access—could further enhance efficiency and user satisfaction.

Table 13 examines usage frequency's impact on assessments, revealing no significant differences across all constructs ($p > 0.05$). Mean scores range narrowly from 2.94 to 3.05, indicating that both occasional and frequent users perceive the platform similarly in terms of design, efficiency, and stability.

Table 13. Test of Difference in the Assessment of the Respondents on the Platform in Terms of Frequency of Use.

Indicator	Frequency of Platform Use	Mean	F	Sig.	Decision on Ho	Interpretation
Functional Design and Practicality	Rarely	3.04	1.21	0.31	Fail to Reject	Not Significant
	Occasionally	2.97				
	Frequently	2.99				
	Very Frequently	2.94				
Process Efficiency and Convenience	Rarely	2.98	0.44	0.73	Fail to Reject	Not Significant
	Occasionally	3.02				
	Frequently	3.04				
	Very Frequently	3.03				
Data Sharing and Cross-Department Collaboration	Rarely	3.01	1.87	0.14	Fail to Reject	Not Significant
	Occasionally	2.95				
	Frequently	3.02				
	Very Frequently	2.91				
Usability and Inclusiveness	Rarely	2.99	0.55	0.65	Fail to Reject	Not Significant
	Occasionally	2.99				
	Frequently	3.00				
	Very Frequently	3.05				
Technical Stability and Security	Rarely	3.02	0.13	0.94	Fail to Reject	Not Significant
	Occasionally	2.99				
	Frequently	3.00				
	Very Frequently	2.99				
Overall Performance	Rarely	3.01	0.98	0.40	Fail to Reject	Not Significant
	Occasionally	2.98				
	Frequently	3.01				
	Very Frequently	2.98				

Notably, very frequent users rated Functional Design and Practicality slightly lower (M = 2.94) than rare users (M = 3.04), indicating that frequent exposure increases sensitivity to interface issues that casual users might overlook. Conversely, infrequent users tend to base evaluations more on initial impressions. Among frequent users, Usability and Inclusiveness received the highest average rating (M = 3.05), reflecting that regular use fosters familiarity and digital confidence despite only incremental system improvements.

The lack of significant differences across usage frequencies demonstrates consistent platform performance and accessibility regardless of engagement level. However, the slight dip in satisfaction among very frequent users underscores the need for ongoing technical responsiveness and design updates to maintain long-term user retention.

Table 14 shows respondents' evaluation of existing platform issues, with an overall mean of 2.96 (SD = 0.33), indicating general agreement that operational challenges remain. The top concern, "The platform lacks personalization features suited to my needs" (M = 3.01), suggests the interface is perceived as somewhat generic, offering uniform services that insufficiently adapt to individual preferences or usage patterns.

Table 14. Assessment of the Respondents on the Existing Problems and User Needs in Terms of Key Problems in Use.

Indicator	WM	SD	QD	VI	Rank
I often find it difficult to locate the services I need.	2.95	0.81	Agree	Evident	3
Some procedures still require manual or offline verification.	2.93	0.83	Agree	Evident	5
The feedback or approval process sometimes takes too long.	2.99	0.81	Agree	Evident	2
The platform lacks personalization features suited to my needs.	3.01	0.80	Agree	Evident	1
The information from different departments is sometimes inconsistent.	2.91	0.79	Agree	Evident	6
I experience difficulty in tracking the progress of my requests.	2.95	0.83	Agree	Evident	4
Overall Mean	2.96	0.33	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

This suggests a growing demand for user-centered design, where the platform adapts intelligently to user profiles or past transactions. Another key concern is the feedback or approval process, which sometimes takes too long (M = 2.99), indicating persistent administrative delays despite efforts to streamline procedures. Coordination issues among departments also surfaced, with inconsistent information from different units receiving the lowest rating (M = 2.91). Such inconsistencies can confuse users and erode trust when conflicting updates occur on the same request.

The close clustering of means (2.91-3.01) shows that no single issue dominates dissatisfaction; rather, moderate problems collectively affect usability. These challenges relate more to procedural inefficiencies and limited customization than to interface design flaws. Users acknowledge progress in digital public service delivery but expect more responsive, intelligent governance tools that anticipate individual needs.

Table 15 highlights user priorities for optimization, with an overall mean of 2.98 (SD = 0.36), reflecting general agreement on necessary improvements. The top item, "The platform interface needs to be more intuitive and friendly" (M = 3.07), underscores the importance of enhancing user experience by reducing navigation friction and clarifying interactions to ease cognitive load.

Table 15. Assessment of the Respondents on the Existing Problems and User Needs in Terms of Priority Optimization Directions.

Indicator	WM	SD	QD	VI	Rank
Simplifying procedures should be the top priority for improvement.	3.00	0.80	Agree	Evident	3
Cross-department data sharing should be strengthened.	2.97	0.84	Agree	Evident	5

The platform interface needs to be more intuitive and friendly.	3.07	0.84	Agree	Evident	1
Personalized services based on user profiles should be developed.	3.00	0.84	Agree	Evident	3
Feedback mechanisms should be faster and more interactive.	2.91	0.83	Agree	Evident	6
Training and tutorials should be provided to guide first-time users.	2.96	0.83	Agree	Evident	4
Overall Mean	2.98	0.36	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

Other priorities include simplifying procedures and developing personalized services based on user profiles (both M = 3.00), reflecting a focus on procedural efficiency and user-centered innovation. Frustrations with redundant steps and multi-page verifications likely drive the demand for simplification, while personalization responds to the earlier identified lack of tailored functionality.

"Feedback mechanisms should be faster and more interactive" received the lowest rating (M = 2.91), indicating users notice some communication improvements but still expect more real-time interaction such as chatbots or notifications. Similarly, "Cross-department data sharing should be strengthened" (M = 2.97) reveals awareness of ongoing integration challenges.

Overall, respondents envision optimization rooted in human-centered design and procedural clarity. The narrow range of means suggests broad consensus that the platform's foundation is solid but needs refinement, guiding future enhancements toward making the system not only functional but also intuitive and engaging.

Table 16 presents users' expectations for future development, with an overall mean of 3.00 (SD = 0.31). The leading expectation, "The system should provide intelligent, AI-based problem-solving assistance" (M = 3.07), highlights growing demand for automation and smart guidance. This reflects users' desire for predictive, responsive support akin to private-sector digital services, emphasizing efficiency and user empowerment.

Table 16. Assessment of the Respondents on the Existing Problems and User Needs in Terms of User Expectations for the Platform.

Indicator	WM	SD	QD	VI	Rank
I expect the platform to integrate all major government services in one place.	3.05	0.81	Agree	Evident	2
The system should provide intelligent, AI-based problem-solving assistance.	3.07	0.78	Agree	Evident	1
Real-time tracking of application progress should be available.	2.90	0.77	Agree	Evident	6
The platform should automatically recommend services based on my profile.	2.96	0.81	Agree	Evident	4
I expect a transparent disclosure of processing times and results.	2.99	0.82	Agree	Evident	3
Future updates should continuously enhance convenience and inclusivity.	3.01	0.84	Agree	Evident	5
Overall Mean	3.00	0.31	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

Following closely is the expectation that "The platform should integrate all major government services in one place" (M = 3.05), reflecting a desire for a truly unified public service ecosystem. This aligns with broader digital governance goals, especially

developing one-stop service portals that minimize switching between departmental systems. In contrast, "Real-time tracking of application progress" scored the lowest ($M = 2.90$), indicating that while users value transparency, this feature is not yet consistently available. Similarly, "I expect transparent disclosure of processing times and results" ($M = 2.99$) highlights demand for greater visibility of bureaucratic timelines.

Overall, these findings reveal evolving citizen expectations—from basic functionality to digital sophistication. Users desire platforms that are not only fast but also intelligent, predictive, and transparent. Although satisfaction with the current system remains evident, users increasingly benchmark government services against the interactivity and responsiveness of private-sector digital platforms.

Table 17 summarizes the overall assessment across the three constructs—Key Problems in Use, Priority Optimization Directions, and User Expectations for the Platform—with a composite mean of 2.98 ($SD = 0.20$). This reflects consistent agreement that the platform functions adequately but has clear areas for improvement. Among the constructs, Priority Optimization Directions ranked highest ($M = 3.00$), indicating users' focus on potential enhancements rather than existing issues.

Table 17. Summary on the Assessment of the Respondents on the Existing Problems and User Needs of the Platform.

Construct	WM	SD	QD	VI	Rank
Key Problems in Use	2.96	0.33	Agree	Evident	2
Priority Optimization Directions	2.98	0.36	Agree	Evident	1
User Expectations for the Platform	3.00	0.31	Agree	Evident	3
Overall Mean	2.98	0.20	Agree	Evident	

Legend: 3.51-4.00 - Strongly Agree (Highly Evident); 2.51-3.50 - Agree (Evident); 1.51-2.50 - Disagree (Slightly Evident); 1.00-1.50 - Strongly Disagree (Not Evident).

User Expectations followed closely ($M = 3.00$), indicating that citizens' desires for smarter, more integrated digital services significantly influence their perceptions. Meanwhile, Key Problems in Use scored slightly lower ($M = 2.96$), suggesting that although users encounter challenges, these do not greatly hinder overall engagement. The narrow differences among the three dimensions reveal a balanced sentiment—users recognize both strengths and shortcomings of the platform but maintain confidence in its growth potential. This cautious optimism reflects a mature user base that understands the complexities of digital governance while expecting greater responsiveness and personalization.

The findings depict a digitally aware public valuing efficiency, transparency, and intelligent design. While the platform has established functional trust, it now faces a more nuanced challenge: meeting rising expectations for adaptive, AI-enhanced, and user-tailored public service delivery.

Regarding demographic differences, Table 18 compares male and female respondents' assessments of existing problems and user needs, showing no significant difference across all constructs ($p > 0.05$) with decisions to "Fail to Reject H_0 ." Overall mean values for both sexes are nearly identical ($M = 2.98$), suggesting similar satisfaction levels and challenges. Minor variations, such as females rating Priority Optimization Directions slightly higher ($M = 3.00$) than males ($M = 2.97$), imply marginally greater attention to usability improvements among women, though these differences are statistically insignificant. This uniformity indicates that the platform's design, accessibility, and performance are gender-neutral, aligning with inclusive digital governance goals emphasizing equal access. Both male and female users share a balanced view of the platform's limitations and improvement priorities, reinforcing equitable digital opportunities regardless of sex.

Table 18. Differences in the Assessment of the Respondents on the Existing Problems and User Needs in Terms of Sex.

Indicator	Sex	Mean	F	Sig.	Decision on Ho	Interpretation
Key Problems in Use	Female	2.94				
	Male	2.98	0.17	0.68	Fail to Reject	Not Significant
Priority Optimization Directions	Female	3.00				
	Male	2.97	0.79	0.37	Fail to Reject	Not Significant
User Expectations for the Platform	Female	2.99				
	Male	3.00	0.27	0.60	Fail to Reject	Not Significant
Overall Existing Problems and User Needs	Female	2.98				
	Male	2.98	0.00	0.97	Fail to Reject	Not Significant

Table 19 compares user assessments across four age brackets: 18-30, 31-45, 46-60, and 60 years and above.

Table 19. Differences in the Assessment of the Respondents on the Existing Problems and User Needs in Terms of Age.

Indicator	Age	Mean	F	Sig.	Decision on Ho	Interpretation
Key Problems in Use	18-30	2.97	0.10	0.96	Fail to Reject	Not Significant
	31-45	2.94				
	46-60	2.96				
	60+	2.97				
Priority Optimization Directions	18-30	2.91	1.58	0.19	Fail to Reject	Not Significant
	31-45	3.02				
	46-60	3.01				
	60+	2.98				
User Expectations for the Platform	18-30	3.05	1.01	0.39	Fail to Reject	Not Significant
	31-45	2.99				
	46-60	2.97				
	60+	2.98				
Overall Existing Problems and User Needs	18-30	2.97	0.03	0.99	Fail to Reject	Not Significant
	31-45	2.98				
	46-60	2.98				
	60+	2.98				

Across all constructs, no significant differences were found ($p > 0.05$), indicating age has little impact on perceptions of the platform's issues and improvement needs. Mean scores cluster around 2.97-3.00, showing consistent views across generations. Respondents aged 31-45 rated optimization priorities slightly higher ($M = 3.02$), possibly due to frequent platform use, while younger users (18-30) were somewhat more critical, likely reflecting higher expectations from commercial digital services. Older users (60+) rated similarly to other groups, suggesting effective accessibility. Overall, the platform demonstrates functional inclusiveness across ages, though future improvements could focus on enhancing intuitiveness for younger, digitally savvy users.

Table 20 shows no significant differences ($p > 0.05$) in perceptions of problems and improvement priorities across digital skill levels. Users with basic, intermediate, or advanced skills share similar experiences, with mean scores between 2.95 and 3.03. Intermediate users rated optimization priorities highest ($M = 3.03$), possibly due to

balanced familiarity, while basic users rated slightly lower, likely reflecting limited experience with advanced features. Advanced users may have higher expectations, leading to more critical assessments. Overall, the platform is accessible to all skill levels, but guided tutorials and contextual help could better support less experienced users.

Table 20. Test of Differences in the Assessment of the Respondents on the Existing Problems and User Needs in Terms of Digital Skill Level.

Indicator	Digital Skill Level	Mean	F	Sig.	Decision on Ho	Interpretation
Key Problems in Use	Intermediate	3.01	0.07	0.93	Accept	Not Significant
	Advanced	2.98				
	Basic	2.97				
	Intermediate	2.95				
Priority Optimization Directions	Advanced	2.96	1.57	0.21	Fail to Reject	Not Significant
	Basic	2.95				
	Intermediate	3.03				
	Advanced	2.96				
User Expectations for the Platform	Basic	2.96	1.31	0.27	Fail to Reject	Not Significant
	Intermediate	3.00				
	Advanced	3.03				
Overall Existing Problems and User Needs	Basic	2.96	0.82	0.44	Fail to Reject	Not Significant
	Intermediate	2.99				
	Advanced	2.98				

Table 21 examines whether users' main purpose for using the platform affects their views on existing issues and future priorities. No significant differences were found across all dimensions ($p > 0.05$), indicating that users-whether accessing administrative procedures, information inquiry, public services, or other functions-share similar experiences.

Table 21. Test of Differences in the Assessment of the Respondents on the Existing Problems and User Needs in Terms of Main Purpose of Platform Use.

Indicator	Main Purpose of Platform Use	Mean	F	Sig.	Decision on Ho	Interpretation
Key Problems in Use	Administrative procedures	2.90	1.63	0.18	Fail to Reject	Not Significant
	Information inquiry	3.01				
	Public services	2.94				
	Other	2.98				
Priority Optimization Directions	Administrative procedures	2.93	1.37	0.25	Fail to Reject	Not Significant
	Information inquiry	2.96				
	Public services	3.05				
	Other	2.99				
User Expectations for the Platform	Administrative procedures	2.99	1.22	0.30	Fail to Reject	Not Significant
	Information inquiry	2.96				
	Public services	2.97				
	Other	3.05				
Overall Existing Problems and User Needs	Administrative procedures	2.94	1.53	0.21	Fail to Reject	Not Significant
	Information inquiry	2.98				

Public services	2.99
Other	3.01

Notably, users of Public Services rated Priority Optimization Directions highest (M = 3.05), likely due to their frequent interaction with procedural tasks, making them more aware of areas needing improvement. Conversely, those using the platform for administrative procedures gave slightly lower scores, possibly reflecting the complexity of document and verification processes.

Overall, mean scores cluster around 3.00, showing general satisfaction but a common recognition of the need for further refinement. This consistency suggests the platform provides a stable user experience across different purposes, though optimizing workflows for administrative users could further boost efficiency and satisfaction.

Table 22 analyzes whether respondents' frequency of platform use affects their perceptions of existing problems and user needs. The results show no significant differences across all constructs ($p > 0.05$), with mean scores ranging from 2.93 to 3.04, indicating consistent evaluations regardless of how often users interact with the platform.

Table 22. Test of Differences in the Assessment of the Respondents on the Existing Problems and User Needs in Terms of Frequency of Platform Use.

Indicator	Frequency of Platform Use	Mean	F	Sig.	Decision on Ho	Interpretation
Key Problems in Use	Rarely	2.95	0.36	0.78	Fail to Reject	Not Significant
	Occasionally	2.93				
	Frequently	2.98				
	Very Frequently	2.97				
Priority Optimization Directions	Rarely	2.93	1.09	0.36	Fail to Reject	Not Significant
	Occasionally	3.03				
	Frequently	2.98				
	Very Frequently	2.99				
User Expectations for the Platform	Rarely	2.95	1.14	0.33	Fail to Reject	Not Significant
	Occasionally	3.04				
	Frequently	2.98				
	Very Frequently	3.01				
Overall Existing Problems and User Needs	Rarely	2.94	1.13	0.34	Fail to Reject	Not Significant
	Occasionally	3.00				
	Frequently	2.98				
	Very Frequently	2.99				

Occasional users gave slightly higher ratings for Priority Optimization Directions (M = 3.03) and User Expectations (M = 3.04), suggesting a more balanced perspective. Rare users rated these aspects slightly lower, possibly due to less familiarity with recent features or updates. Frequent and very frequent users had similar views, implying that usage intensity does not markedly influence satisfaction.

Overall, the stable responses indicate reliable platform performance across different usage levels. This consistency also highlights an opportunity: frequent users, with their deeper experience, could be engaged to provide valuable feedback and help drive ongoing improvements, potentially becoming "platform ambassadors."

Table 23 explores the relationship between respondents' assessments of the platform's current performance and their views on existing problems and user needs. Most correlations were not significant; however, three negative correlations and one

overall inverse correlation were observed. These findings suggest that as users perceive better platform performance, they tend to report fewer problems and unmet needs.

Table 23. Correlation in the Assessment Between the Current Performance of the Platform and the Existing Problems and User Needs.

Current Performance of the Platform	Existing Problems and User Needs	Computed r	Sig. (2-tailed)	Decision on Ho	Interpretation
Functional Design and Practicality	Key Problems in Use	0.02	0.77	Fail to Reject	Not Significant
	Priority Optimization Directions	-0.03	0.58	Fail to Reject	Not Significant
	User Expectations for the Platform	-0.02	0.75	Fail to Reject	Not Significant
Process Efficiency and Convenience	Key Problems in Use	0.01	0.87	Fail to Reject	Not Significant
	Priority Optimization Directions	-0.04	0.54	Fail to Reject	Not Significant
	User Expectations for the Platform	-0.04	0.46	Fail to Reject	Not Significant
Data Sharing and Cross-Department Collaboration	Key Problems in Use	-0.00	0.95	Fail to Reject	Not Significant
	Priority Optimization Directions	-0.15*	0.01	Reject Ho	Significant (Negative Correlation)
	User Expectations for the Platform	-0.04	0.46	Fail to Reject	Not Significant
Usability and Inclusiveness	Key Problems in Use	-0.04	0.45	Fail to Reject	Not Significant
	Priority Optimization Directions	-0.12*	0.04	Reject Ho	Significant (Negative Correlation)
	User Expectations for the Platform	-0.01	0.91	Fail to Reject	Not Significant
Technical Stability and Security	Key Problems in Use	0.09	0.12	Fail to Reject	Not Significant
	Priority Optimization Directions	0.04	0.52	Fail to Reject	Not Significant
	User Expectations for the Platform	-0.12*	0.03	Reject Ho	Significant (Negative Correlation)
Overall Performance of the Platform	Overall Existing Problems and User Needs	-0.13*	0.03	Reject Ho	Significant (Inverse Correlation)

Significant negative correlations were found between several platform performance aspects and user concerns. Data Sharing and Cross-Department Collaboration negatively correlated with Priority Optimization Directions ($r = -0.15, p = 0.01$), indicating that better interdepartmental integration reduces the perceived need for process improvements. Usability and Inclusiveness also showed a negative correlation with Priority Optimization

Directions ($r = -0.12$, $p = 0.04$), suggesting that a more user-friendly interface lowers demands for redesign. Technical Stability and Security is negatively correlated with User Expectations ($r = -0.12$, $p = 0.03$), meaning that increased system reliability dampens the demand for innovation.

Overall Platform Performance had a significant inverse relationship with Existing Problems and User Needs ($r = -0.13$, $p = 0.03$), indicating that better perceived functionality corresponds with fewer reported issues. Though correlations are weak, the consistent pattern highlights that as the platform becomes more integrated, inclusive, and stable, users tend to perceive fewer problems and lower demands for change.

4. Discussions

The study collected responses from 300 users representing a balanced demographic profile, with the largest age group being 31-45 years old and a substantial portion of users aged 60 and above. Male respondents slightly outnumbered females, and most participants reported intermediate digital skills. The primary reasons for platform use included administrative tasks, information inquiry, and other service-related activities, with usage frequency evenly distributed between frequent and very frequent users, indicating an engaged and diverse user base.

Overall, the platform received a positive evaluation with a mean score of 2.99, suggesting general user satisfaction with its functionality and reliability. Process Efficiency and Convenience were rated highest, reflecting appreciation for streamlined procedures and time-saving features, followed closely by Technical Stability and Security. However, Data Sharing and Cross-Department Collaboration scored the lowest, highlighting areas for improvement in interdepartmental integration.

When assessing existing problems and user needs, respondents demonstrated moderate satisfaction but expressed growing expectations for enhanced features such as AI-driven assistance and a fully integrated service ecosystem. Users prioritized improvements in interface intuitiveness and procedural simplification while noting challenges like limited personalization and continued reliance on offline verification.

Demographic analyses revealed no significant differences in perceptions across gender, age, digital skill level, usage purpose, or frequency, underscoring the platform's inclusive design and equitable user experience. Notably, middle-aged users and those with intermediate digital skills showed slightly more positive assessments of certain features, reflecting their familiarity and engagement levels.

Correlation analyses indicated that better platform performance-especially in data sharing, usability, and technical stability-was associated with reduced user demands for optimization and fewer reported problems. These findings suggest a direct link between operational quality and user satisfaction, affirming that improvements in functionality can effectively address user concerns.

5. Conclusion

This study concludes that the Shandong Province Digital Government Public Service Platform effectively serves a demographically diverse user base, with active participation across different ages, genders, and levels of digital literacy, demonstrating its broad accessibility. Users generally acknowledge the platform's efficiency and reliability but highlight the need for improved interdepartmental data sharing, clearer service categorization, and more timely feedback. While some moderate issues persist-such as redundant verification processes, delays in responses, and limited personalization-these reflect minor inefficiencies rather than fundamental system failures. The public's capacity to identify these areas indicates a growing digital maturity and a rising demand for smarter, more adaptive government services. Furthermore, no significant differences were observed in user assessments across demographic groups, reinforcing the platform's inclusive design. Importantly, the findings confirm that enhancements in system

functionality, stability, and usability are key to boosting user satisfaction and trust, emphasizing the need for continued focus on interoperability and user-friendly interfaces in digital governance.

References

1. J. Spohrer, P. P. Maglio, J. Bailey, and D. Gruhl, "Steps toward a science of service systems," *Computer*, vol. 40, no. 1, pp. 71-77, 2007. doi: 10.1109/MC.2007.33.
2. R. B. Denhardt, and J. V. Denhardt, "The new public service: Serving rather than steering," *Public administration review*, vol. 60, no. 6, pp. 549-559, 2000. doi: 10.1111/0033-3352.00117.
3. Perri 6, "Joined-up government in the western world in comparative perspective: A preliminary literature review and exploration," *Journal of Public Administration Research and Theory: J-PART*, pp. 103-138, 2004. doi: 10.1093/jopart/muh006.
4. Sun, J., Fan, J. P., Xu, et al., "Design and application of 'Internet +' government big data intelligent service platform," *Integration Technology*, vol. 12, no. 1, pp. 4-16, 2023. doi: 10.12146/j.issn.2095-3135.20220826001.
5. J. W. Creswell, and J. D. Creswell, "Research design: Qualitative, quantitative, and mixed methods approaches," Sage publications, 2017. ISBN: 9781506386706.

Disclaimer/Publisher's Note: The views, opinions, and data expressed in all publications are solely those of the individual author(s) and contributor(s) and do not necessarily reflect the views of PAP and/or the editor(s). PAP and/or the editor(s) disclaim any responsibility for any injury to individuals or damage to property arising from the ideas, methods, instructions, or products mentioned in the content.