DIJEFA: Dinasti International Journal of Economics, Finance & Accounting
E-ISSN: 2721-303X
P-ISSN: 2721-3021
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455
DOI: https://doi.org/10.38035/dijefa.v7i2

A Systematic Review of How Usability and Accessibility Drive Satisfaction in Next-Gen E-Government

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Abstract: This study discusses user satisfaction in e-government service using the framework of communication theory, specifically the usability-accessibility standard and the Technology Acceptance Model (TAM). The primary aim is to analyze how usability and accessibility affect user satisfaction on various e-government platforms. This will be based on communications and information system theories. The study does not formulate a strict hypothesis but would be open to well-considered systems that are well-correlated with citizen satisfaction. A systematic literature review (SLR) was conducted, combining 54 peer-reviewed papers from 2008 to 2024. Utilizing PRISMA guidelines, articles were chosen and analyzed thematically within six research questions (RQ1–RQ6). Methods employed were qualitative and quantitative, including questionnaires, usability testing, and model-based measurement (e.g., TAM, DeLone & McLean IS Success Model) as the primary framework of analysis. Results show that usability (32 studies) and accessibility (in 32 combined cases) are standard drivers of satisfaction, particularly in Government-to-Citizen (G2C) services, which made up 85% of the articles. Technical limitations, poor interface design, and infrastructural deficiency were the most cited hindrances. The findings validate TAM's explanatory power and coincide with previous communication-oriented usability models, such as ISO 9241. Though user-centered design is cited most, it's not examined as a distinct variable for accessibility in this review. This review concludes that e-government user satisfaction is defined by a combination of technical, design, and communication variables. Future research must concentrate on accessibility as a standalone measure and broaden research on Government-to-Government (G2G) services to gain a comprehensive understanding.

Keywords: Accessibility, Digital government, Systematic Literature Review, Usability, User satisfaction.

INTRODUCTION

With the rise of digital transformation within this era, electronic government (e-government) takes a primary role in transforming public services for citizens. By using

digital technology, e- government projects aim to make public administration more efficient, transparent, and accessible (Alshira'H, 2020). They can access different services such as civil registration, tax payment, public complaints, and licensing without the need for physical visits via government websites and mobile applications (Faqih et al., 2020). It not only saves time and cost but also promotes the overall goals of good governance and inclusive development (Bournaris, 2020). However, despite the widespread use of online platforms, citizens' satisfaction with e-government services remains inconsistent. In most of the world, including Indonesia, digital infrastructure has been extensive, but citizens are dissatisfied with system usability, lousy interface design, lack of responsiveness, and accessibility (Firdaus & Zakiah, 2021). The government of Indonesia has made efforts in reforming digital government public services, including releasing Presidential Regulation No. 95 of 2018 on the Electronic-Based Government System (*Sistem Pemerintahan Berbasis Elektronik/SPBE*). The regulation states that digital services should be integrated, secure, user-centered, and uniform for all government institutions. But these policy measures have not always resulted in consistently high user satisfaction.

There are existing overviews limited to specific services or local portals, rather than providing an extended overview across various e-government contexts. While the topic of user satisfaction has been repeatedly mentioned in e-government studies, only a few review articles specifically focus on consolidating the findings across multiple contexts (Aleisa, 2024; Huda et al., 2022). Moreover, those review studies did not specifically focus on user usability and accessibility. Usability and accessibility have been consistent factors for satisfaction (Alshira'H, 2020; Fakrudeen, 2024). A comprehensive systematic literature review (SLR) is needed to map out the various dimensions, definitions, and indicators used in satisfaction studies, particularly those that include usability and accessibility as key variables. Furthermore, the most recent SLR that centrally focused on satisfaction in e-government services was published in 2021, creating a gap in more updated syntheses that reflect ongoing trends and methodological developments.

This study examines several of the most significant aspects of user satisfaction with e- government services. Six research questions need to be addressed in this research:

1. RQ1: What factors affect user satisfaction within the e-government services?
2. RQ2: How do usability and accessibility influence user satisfaction?
3. RQ3: What theoretical models are used to measure satisfaction?
4. RQ4: What methods are used in evaluating e-government satisfaction?
5. RQ5: What are the main challenges in achieving user satisfaction?
6. RQ6: What types of e-government services are evaluated?

METHOD

To better understand how user satisfaction is defined and measured in e-government services, it is important to look at the main theories used in information systems research. These theories help explain key factors like the usability and ease of use of a system, the quality of the information provided, and the system's reliability—factors that are strongly connected to user satisfaction. Theoretical models such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Expectation Confirmation Theory (ECT), and DeLone and McLean Information System Success Model have been widely used in existing research on technology adoption and implementation, system performance, and service satisfaction. The models quoted identify variables such as perceived usefulness, perceived ease of use, information quality, and system reliability as measurement tools of user satisfaction. These models are essential for this study because many of the articles reviewed use them either directly or with some changes when measuring user satisfaction with e-government services. This research aims to find out

which models are used most often and how they include usability and accessibility, which are the two main focus areas of this study.

Satisfaction in e-government is usually two factors: usability and accessibility. Usability is defined by ISO 9241-11 as the extent to which a system enables users to achieve their goals effectively, efficiently, and feel satisfied while doing it. Accessibility means the extent to which a web service is accessible to users with varying abilities and is usually measured in terms of standards like the Web Content Accessibility Guidelines (WCAG). While these concepts are well-represented in the literature, existing studies are still fragmented in their conceptualization and measurement of user satisfaction. Other analyses talk about system performance or service quality without defining satisfaction as an immediate outcome, or they deal with usability and accessibility without studying their actual impact on satisfaction. Previous works by Alshira'H (2020) also experimented with usability and accessibility effects on Jordanian e-government satisfaction without experimenting in international contexts. Similarly, Rahayu et al. (2022) applied the Service Quality (SERVQUAL) model to measure satisfaction with domestic complaint-processing services, with few applications. These studies, as remarkable as they are, show a need for broader, larger research. Other studies, like those of Firdaus and Zakiah (2021), emphasize usability by direct testing but are limited to Indonesian institutional case studies. Bournaris (2020) highlights user satisfaction by multicriteria analysis, but only for Greek agricultural portals. Likewise, Lorenzo and Lago (2012) provide a sectoral model of usability for Spanish health portals, but not on satisfaction by sectors or nations. By looking into these theoretical models, this study can better understand how each model connects to user satisfaction in various types of e-government services.

Material and Methodology

The review method has been widely used to map current literature. Two options of review methods are bibliometric analysis (Arviansyah et al., 2024) and systematic literature review (Harsanto et al., 2025; Lestari et al., 2025). This study uses a Systematic Literature Review (SLR) method to explore user satisfaction in e-government services, with a particular focus on usability. SLR was chosen to help identify patterns, themes, and findings from past studies in a structured and transparent way. The review process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach, which includes three main steps: setting the search strategy, applying inclusion and exclusion criteria, and reviewing the final set of articles. The literature search was done using the Scopus database because of its broad coverage and reliable academic sources. The keywords used in the search were: “user” AND “satisfaction” AND “usability” AND “e-government”. This search returned 73 documents. Filters were applied to include only English-language articles that were already published in their final version, which reduced the results to 69 articles. These articles were then screened manually based on titles and abstracts using an inclusion/exclusion matrix.

Here’s how the screening was done:

1. 1 article was removed because it was a duplicate (the same study was published in a journal and a conference).
2. 8 articles were excluded because they couldn’t be found or didn’t have a clear title, abstract, or author information.
3. 3 articles were excluded because they didn’t match the topic.

After this step, 57 articles were left. Then, during the matrix review process, 3 more articles were removed because the full texts were not accessible. In the end, 54 articles were selected and analyzed. These papers are the main source of data for this study. They were

reviewed and categorized based on the six research questions to understand the current state of user satisfaction studies in e-government.

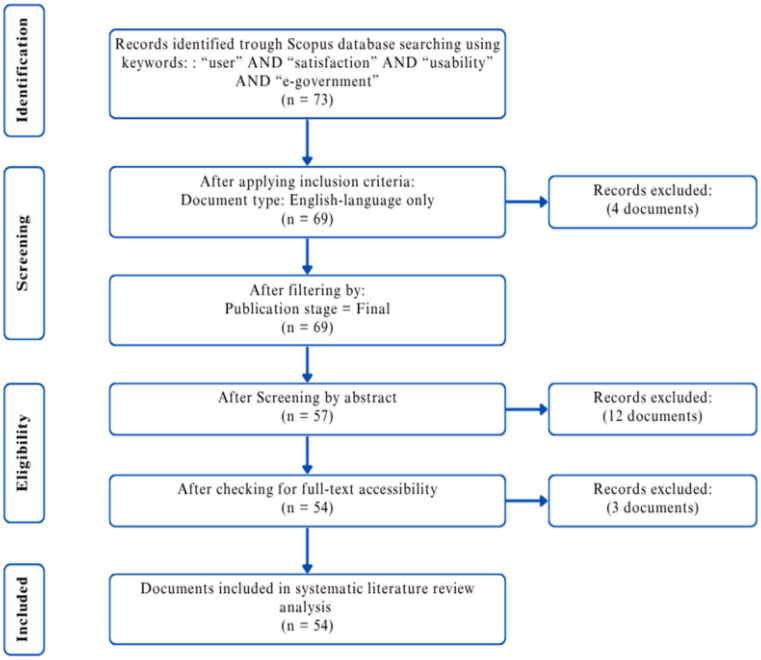

Figure 1. Prisma Diagram

RESULTS AND DISCUSSION

This section presents the general conclusions of the systematic literature review (SLR), thematically organized based on the six research questions (RQ1–RQ6). In total, 54 peer-reviewed articles were considered, published between 2008 and 2024. Patterns are explained in accordance with thematic trends, frequency of occurrence, and methodological focus, with table summaries for reference convenience. Before presenting thematic observations, it is necessary to discuss the geographical scope of the research. Being aware of where the e-government satisfaction studies have been conducted puts the findings into context, especially for those that have infrastructure, policy environments, and digital adoption levels.

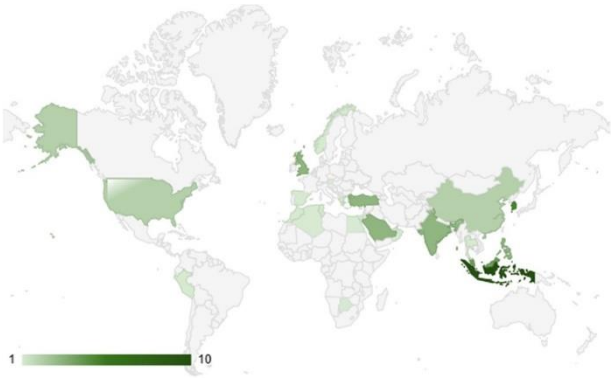

Figure 2. Heatmap of frequency of studies by country

Figure 2 shows the heatmap of countries with the highest research focus, which are shaded darker. Indonesia, South Korea, and Malaysia are leading contributors and reflect an active interest in measuring and improving digital government services for these nations.

Table 1. Country Distribution of Reviewed Articles (Top 5 Highlighted)

Country	Number of Articles	Example References
Indonesia	10	(Nindito et al., 2019), (Lestari et al., 2017), (Kencono et al., 2025)
South Korea	5	(Cho et al., 2021), (Lee et al., 2008), (Cho et al., 2019)
Malaysia	4	(Marzoughi et al., 2010), (Mior Ibrahim et al., 2023), (Hussain et al., 2019)
United Kingdom	3	(Benaida, 2023), (Rigas & Almutairi, 2013), (Waller et al., 2014)
Saudi Arabia	3	(Abanumy, 2009), (Eidaroos & Alkraiji, 2015), (Aldabbas et al., 2013)
Others (19 countries)	29	India, Philippines, USA, Türkiye, Egypt, etc

Data presented in Table 1 indicates that the most common place of the studied articles was Indonesia (10 articles), followed by South Korea (5 articles), Malaysia (4 articles), and three nations, each with three articles. The remaining 19 nations contributed only one or two studies and are included under "Others". This distribution highlights a research intensity in Southeast and East Asia, particularly in Indonesia, where national and regional e-government portals have been exposed to considerable academic review.

RQ1: What Factors Affect User Satisfaction with E-Government Services?

User satisfaction in e-government applications depends on a combination of technical effectiveness, system usability, and user-centric design. Based on the review of 54 papers, several critical determinants were most important: usability, ease of use, website aesthetics, effectiveness, and perceived usefulness. These variables were present across various service domains and user situations and therefore imply generalizability beyond country or system type.

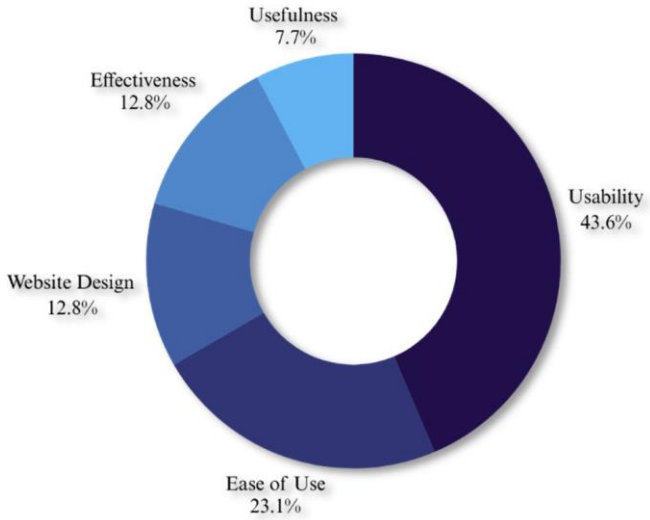

Figure 3. Pie Chart of Studies per Core Factor

Figure 3 shows the frequency of important determinants of user satisfaction with e-government services. Usability (43.6%) is cited most frequently, followed by ease of use (23.1%), which is a critical element of usability. Other key determinants are website design (12.8%), effectiveness (12.8%), and usefulness (7.7%). All of these factors emphasize that user satisfaction is not just a matter of how well the system performs but also how simple and enjoyable it is to use.

Table 2. Core Determinants of User Satisfaction

Factor	Number of Studies	Example References
Usability	17	Lee et al. (2008), Pyarelal dan Das (2017), Aldabbas et al. (2013)
Ease of Use	9	(Kontogiannatou et al., 2019), (Firdaus & Zakiah, 2021), (Hashim et al., 2022)
Website Design	5	(Marzoughi et al., 2010), (Pang et al., 2015), (Bournaris, 2020)
Effectiveness	5	(Bataineh et al., 2018), (Liu & Kim, 2023), (Waller et al., 2014)
Usefulness	3	(Pyarelal & Das, 2017), (Sørum, 2019), (Akpinar & Ondin, 2008)

Table 2 cited Usability the most, including these attributes: ease of use, logical interface flow, error minimization, and simplicity in doing tasks. Usability refers to how effectively, efficiently, and satisfactorily a user can interact with a system to achieve their goals. Ease of use, which is one component of usability, reflects how simple and straightforward the system is to operate without requiring extensive learning or technical knowledge (Anggraeni, 2025). Ease of use emerged as an independent topic in nine of the studies, supporting the idea that users will favor those services with minimal learning effort and mental load. Design factors like visual composition, responsiveness, and consistency were likewise most often linked with satisfaction outcomes. Site design affects first impressions and also builds up over time, especially among less technology-literate users. Effectiveness, while more outcome-oriented, addresses the degree to which users can achieve their intended objective without much frustration. Usefulness sums up the perceived value of the system to solve real-world necessities or reduce bureaucratic hassles. Combined, the findings suggest that satisfaction is not solely a function of the technical quality of an e-government platform but of how effectively it aligns with user expectations, behaviors, and actual life service needs. This supports the case for more complete and citizen-centric design and evaluation approaches in future e-government development.

RQ2: How Do Usability and Accessibility Influence User Satisfaction?

Usability and accessibility are two of the most important factors in determining levels of user satisfaction with e-government services (Bewinda et al., 2024; Rakhmani & Sugihartati, 2023). Of the 54 papers examined, 32 studies considered usability and accessibility together, while 22 studies only considered usability as a stand-alone construct. Interestingly, not one article reviewed considered accessibility as a standalone factor, suggesting perhaps that accessibility is typically included within broader usability

debates rather than separately considered.

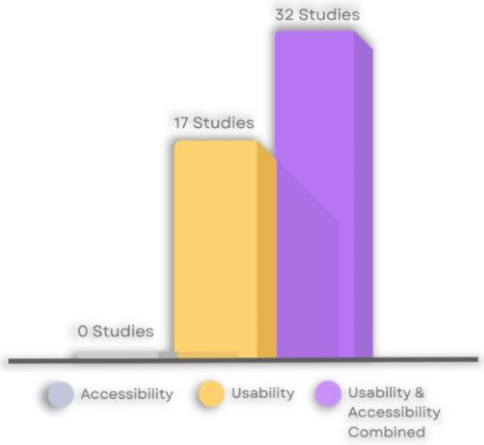

Figure 4. Bar Chart of Studies Distribution on Usability and Accessibility

Figure 4 above illustrates how many research papers concentrate on usability alone, accessibility alone, and usability and accessibility combined, in the user satisfaction with the e-government services environment. It highlights that while usability is often considered on its own or together with accessibility, none of the research delved into accessibility on its own. This shows accessibility is typically bound within broad usability discussion rather than being treated separately.

Table 3. Influence of Usability and Accessibility on Satisfaction

Category	Number of Studies	Example References
Usability	17	(Prastya et al., 2023), (Cho et al., 2019), (Akpinar & Ondin, 2008)
Accessibility	0	-
Usability & Accessibility Combined	32	(Bouzas-Lorenzo & Lago, 2012), (Byun & Finnie, 2011), (Kureerung & Ramingwong, 2019)

Table 3 shows usability, which includes the following variables such as ease of use, information clarity, intuitive usability, and productivity in tasks, always ranks among the important elements of user satisfaction for e-government applications. In 17 studies, usability was measured using a range of frameworks, including ISO 9241-11 standards and Nielsen's usability heuristics. For example, studies such as Cho et al. (2021), Adinda and Suzianti (2018), and Firdaus and Zakiah (2021) have demonstrated that structures with clear structure, reasonable navigation paths, and effective feedback mechanisms significantly improved satisfaction levels. These types of systems enabled users to accomplish tasks with less effort and fewer errors, highlighting the importance of designing in line with the user journey. Above all else, the widespread usability applicability across various types of services from mobile prison apps (Firdaus & Zakiah, 2021) to purchasing systems (Mior Ibrahim et al., 2023) indicates its widespread usability applicability in the provision of public digital services.

The large number of studies focusing on usability and accessibility shows how closely these two factors are linked in shaping user experiences. As many as 32 studies

examined usability and accessibility together, strongly considering their joint significance. Studies such as Pyarelal and Das (2017), Marzoughi et al. (2010), Liu and Kim (2023), and Alshira'H (2020) tested for responsiveness on mobile devices, size and color of text, fluid layouts, and multiple language support. These conditions are most important to users with physical, cognitive, or technological disabilities. For instance, the study by Cuarez et al. (2024) illustrated the necessity for digital systems to adapt towards older persons who are not accustomed to mobile technology, and the study by Bouzas-Lorenzo and Lago (2012) suggested computerized access testing conducted with WAT tools was capable of detecting widespread visual and functional barriers that deter participation.

Although accessibility is important for practical reasons, it has not yet been given enough attention as a main theory in current research. This gap offers a great chance for future studies to explore accessibility more deeply, especially in terms of inclusive digital governance. Overall, the research confirms that making e-government services both accessible and usable is key not only for achieving high citizen satisfaction but also for ensuring everyone has equal access to public services.

RQ3: What Theoretical Models Are Used to Measure Satisfaction?

A broad range of theoretical models was applied across the reviewed studies. These frameworks serve as systematic lenses that scholars apply to identify how various facets of digital systems, such as usability, perceived ease of use, quality of service, or user expectations, influence satisfaction and subsequent use. The standards are not only methodology tools but also conceptual foundations that shape how satisfaction is conceptualized, measured, and understood within contexts.

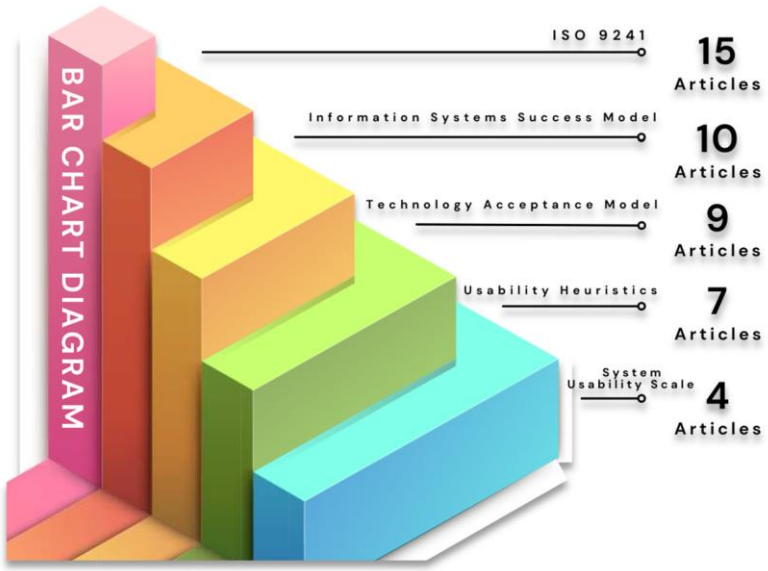

Figure 5. Bar Chart of Studies Using Different Theoretical Models

Figure 5 shows how frequently each theoretical model or framework was applied. The ISO 9241 usability standard (15 articles) was the most commonly used model, followed by the Information Systems Success Model (10 articles) and the Technology Acceptance Model (9 articles). Nielsen's Usability Heuristics (7 articles) and the System Usability Scale (4 articles) were also used but less frequently.

Table 4. Theoretical Models in Use

Model / Framework	Number of Articles	Sample References
ISO 9241 Standard for Usability by International Organization for Standardization (1998)	15	(Bataineh et al., 2018), (Ro et al., 2024), (Kureerung & Ramingwong, 2019)
Information Systems Success Model by William H. DeLone & Ephraim R. McLean (1992, updated in 2003)	10	(Bhattacharya et al., 2012), (Okike & Small, 2023), (Ramantoko & Irawan, 2017)
Technology Acceptance Model (TAM) by Fred D. Davis (1986)	9	(Albayrak & Çağiltay, 2013), (Anthopoulos & Sirakoulis, 2015), (Akpinar & Ondin, 2008)
Usability Heuristics by Jakob Nielsen (1994)	7	(Byun & Finnie, 2011), (Abdel-Fattah & Galal-Edeen, 2008), (Eidaroos & Alkraiji, 2015)
System Usability Scale (SUS) by John Brooke (1986)	4	(Pang et al., 2015), (Horan et al., 2006), (Ro et al., 2024)

Table 4 and Figure 5 show that the ISO 9241 usability standard was the most frequently cited framework in 15 of the studies. It was predominantly utilized in evaluating the ergonomic and user- centered design principles of government sites and apps with particular emphasis on learnability, efficiency, and user satisfaction. Studies that used this model (e.g., Albayrak & Çağiltay, 2013; Benaida, 2024; Sørum, 2019; Hussain et al., 2019) often used heuristic checklists or lab-based usability testing to determine whether systems met minimal usability demands, mainly in task accomplishment and error rate by users. The DeLone & McLean Information Systems Success Model (1992; updated 2003) emerged as yet another dominant framework, cited in 10 studies. This model integrates ideas such as information quality, system quality, and service quality, all of which influence user satisfaction and intention to use. Studies such as Prastya et al. (2023) and Okike and Small (2023) applied this model to measure government web portals and procurement systems. They determined that information and service quality correlated with satisfaction higher than technical system quality alone, especially in environments where there is uneven infrastructure or content delivery.

The Technology Acceptance Model (TAM) was also cited in nine articles. TAM focuses on perceived ease of use and perceived usefulness as the two primary determinants of user acceptance. TAM proved particularly useful when studying mobile apps and citizen services where adoption matters (e.g., Nindito et al., 2019; Anthopoulos & Sirakoulis, 2015; Cho et al., 2019). Researchers employed TAM alone and in combination with others like IS Success to add more explanatory power to studies on new digital functionalities or new technologies. Jakob Nielsen's Usability Heuristics (cited in seven papers) were primarily used in interface testing and design critique. Such studies (e.g., Bouzas-Lorenzo & Lago, 2012; Schmidt et al., 2010; Eidaroos & Alkraiji, 2015) applied heuristic evaluation to identify navigation, visual design, and consistency errors that would decrease satisfaction. Similarly, the System Usability Scale (SUS) administered in four studies provided a methodical method to measure satisfaction through a Likert-scale questionnaire. It was helpful to employ in the comparison of redesigns and the validation of interface improvement across time.

In summary, the literature shows that no single model works well in every situation. Instead, researchers often combine several frameworks to balance strong theoretical ideas with practical usability insights. Models like TAM and IS Success are reliable for

predicting satisfaction and user behavior, while usability standards like ISO 9241 and SUS provide detailed ways to assess user experience. Future research can be improved by using hybrid models that include both perception-based and performance-based measures, providing a more comprehensive understanding of satisfaction in e- governance settings.

RQ4: What Methods Are Used in Evaluating E-Government Satisfaction?

User satisfaction measurement in the e-government service relies on a wide variety of methodological strategies that correspond to the technical complexity and human-centered subject matter of the field. From the review of 54 peer-reviewed articles, three general categories of methods were identified: quantitative (28), qualitative (8), and mixed methods (18). Quantitative methods were applied most often and were found in more than half of the studies reviewed. Under the quantitative methods, questionnaire surveys were found to be the most common approach, being found in at least

19 studies (e.g., Kontogiannatou et al., 2019; Prastya et al., 2023; Alshira'H, 2020). These questionnaires often employed highly established measurement instruments like the System Usability Scale (SUS), WebQual 4.0, USE Questionnaire (Dela Cruz et al., 2023), or ad-hoc Likert-scale questionnaires to measure user satisfaction on dimensions such as usefulness, ease of use, effectiveness, and system quality.

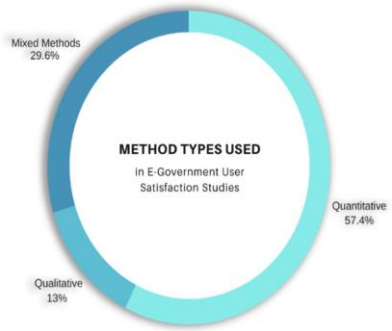

Figure 6. Pie Chart of Research Methods Used

Figure 6 presents the distribution of methodological approaches used in the reviewed studies. Quantitative methods were the most common with 57.4% (31 studies), often involving surveys, statistical analysis, and usability testing. Other quantitative methods were also used, such as expert statistical analysis (Benaida, 2023), heuristic usability evaluation by experts (Eidaroos & Alkraiji, 2015), sentiment analysis (Kencono et al., 2025), and soft computing techniques (Lestari et al., 2017). Some studies used lab-based usability tests with real-time user monitoring, including eye-tracking (Albayrak & Çağiltay, 2013; Bataineh et al., 2018), task-based performance measurement focusing on accuracy (Schmidt et al., 2010), and statistical methods like regression and structural equation modeling (Byun & Finnie, 2011)

Mixed methods were used in 29.6% (16 studies), combining quantitative tools with qualitative feedback techniques. For example, Kurnia et al. (2024) used the User Experience Questionnaire (UEQ) alongside qualitative usability testing of a prototype system created using Figma. Qualitative methods, such as interviews (Mior Ibrahim et al., 2023) and theoretical modeling (Abdel-Fattah & Galal-Edeen, 2008), were applied in 7 studies (13%) to capture user experiences and contextual insights.

Lastly, the findings indicate that e-government satisfaction measurement increasingly requires methodological diversity. Whereas quantitative methods provide scalability and statistical validity, qualitative and mixed approaches provide richer insights by capturing user expectations, frustrations, and situational barriers. The shift towards the use of

multiple methods indicates more recognition that user satisfaction with e-government service is context-dependent and complex, requiring both behavioral measures and experiential accounts to be properly measured.

RQ5: What Are the Main Challenges in Achieving User Satisfaction?

Some typical challenges were encountered that hinder effective provision and perceived quality of e-government service. These barriers traverse technical, design, infrastructural, organizational, and evaluation areas. The following table captures the top five most frequently reported challenge categories, representative descriptions, frequency, and illustrative studies.

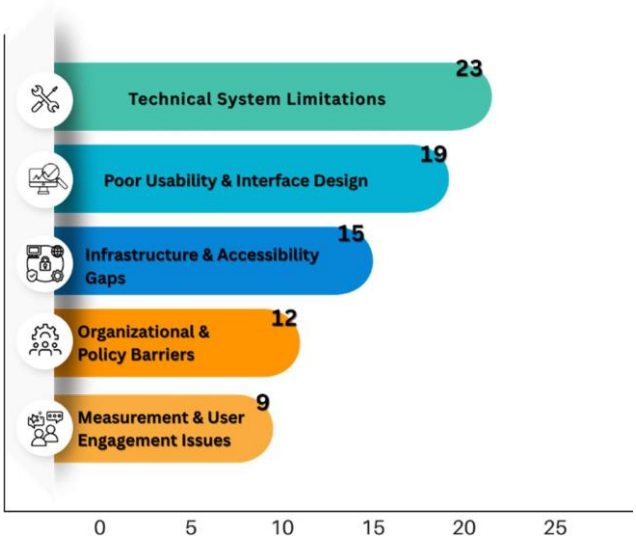

Figure 7. Row Chart of Frequently Reported Challenges

Figure 7 shows the most common challenges found in studies about e-Government user satisfaction. The biggest issue was technical problems, such as slow-loading pages or apps that crashed. This was followed by poor user experience and design, limited infrastructure and access, organizational and policy obstacles, and a lack of user responsibility or oversight. These issues reflect the wide range of factors that can reduce user satisfaction with digital government services.

Table 5. Most Frequently Reported Challenges in E-Government Satisfaction Studies

Challenge Category	Description	No. of Studies	Example Sources
Technical System Limitations	Errors, crashes, poor responsiveness, slow load times	23	Kencono et al. (2025), Pang et al. (2015), Ibrahim et al. (2023)
Poor Usability & Interface Design	Complex navigation, layout issues, lack of feedback, cluttered pages	19	Benaida (2023), Cruz et al. (2023), Eidaroos & Alkraiji (2015)
Infrastructure & Accessibility Gaps	Poor connectivity, limited mobile/device access, digital divide	15	Kulkarni et al. (2024), Cuarez et al. (2024), Sørum (2019)
Organizational & Policy Barriers	Lack of coordination, limited stakeholder input, outdated content	12	Abanumy (2009), Abdel-Fattah & Galal-Edeen (2008)

Measurement & User Engagement Issues	Low use of satisfaction metrics, poor feedback mechanisms, no citizen-centered evaluation	9	Horan et al. (2006), Al Balushi & Ali (2020), Anthopoulos & Sirakoulis (2015)

Table 5 shows that we can see among them, technical system constraints were the prevalent problem. Over 20 studies listed such issues as high system error rates, stuck pages, maintenance downtime, and unstable performance as the main sources of user frustration. For instance, Kencono et al. (2025) referred to network unreliability and slow loading speeds in mobile apps like Sapawarga and JAKI. Similarly, Ibrahim et al. (2023) found performance failure in the e-procurement system of Malaysia, including fluctuations in functionality during peak usage. Inadequate usability and interface design were the second most frequent challenge. In 18 or more studies, users complained about navigating government websites and applications with difficulty because of different layouts, unclear menus, lengthy or complicated forms, and inadequate visual feedback. Benaida (2023) contrasted Algerian and UK e-government websites and documented Algerian website design inefficiencies such as broken links and poor mobile responsiveness. Cruz et al. (2023) and Eidaroos & Alkraiji (2015) also documented deep usability deficiencies on local websites, particularly in terms of information exposure and user accessibility for users with disabilities and mobile users.

Infrastructural and accessibility issues were prevalent in 15 studies, particularly when mentioning developing countries. Limited internet availability, poor mobile network connection, and low digital literacy rates were commonly attributed as obstacles to equitable service provision. Kulkarni et al. (2024) emphasized the uneven quality of ICT infrastructure, while Sørum (2019) presented the uneven evolution of municipal websites across Norway due to a lack of resources and provisions for accessibility. Organizational and policy-level concerns were referenced in at least 12 studies. These were concerns of a lack of interdepartmental cooperation, stale or redundant content, and poor internal procedures for constant improvement. Abanumy (2009) and Abdel-Fattah & Galal-Edeen (2008) highlighted the absence of citizen-centered planning in e-government development, noting that websites were sometimes created without thorough need assessments.

Finally, 9 studies pointed out insufficient measurement of satisfaction and user involvement. For example, Horan et al. (2006) argued that traditional performance indicators often overlook user input. Al Balushi & Ali (2020) proved that Oman's measures of satisfaction were not contextualized and were not specific, hence less effective in policy development. Anthopoulos and Sirakoulis (2015) reiterated this by demonstrating that even when portals were renovated, modifications were not evaluated systematically on the basis of end-user performance. In conclusion, enhancing e-government satisfaction goes beyond enhancing technical performance. It entails resolving design defects, providing stable infrastructure, involving users substantively, and harmonizing organizational processes with ongoing service assessment.

RQ6: What Types of E-Government Services Are Evaluated?

This study reviewed 54 articles and grouped them based on the type of e-government services discussed. The services are categorized into four types: G2C, G2B, G2E, and G2G (Layne & Lee, 2001). The table below shows how many articles focused on each type.

Table 6. Types of E-Government Services Found in the Reviewed Articles

Type of E-Government	Number of Articles	References
G2C (Government to Citizen)	46	(Bouzas-Lorenzo & Lago, 2012), (Okike & Small, 2023), (Aldabbas et al., 2013)
G2B (Government to Business)	3	(Mior Ibrahim et al., 2023), (Ramantoko & Irawan, 2017), (Hashim et al., 2022)
G2E (Government to Employee)	4	(Cuarez et al., 2024), (Kontogiannatou et al., 2019), (Del Pilar et al., 2024), (Okike & Small, 2023)
G2G (Government to Government)	0	0

Table 6 shows that 46 articles focused on G2C services, which indicate direct interaction between governments and citizens via digital platforms. Citizens now use websites and mobile apps for services such as ID card appointments, passport issuance, driver's license renewal, and complaints. G2C platforms aim to improve access and responsiveness. Digital transformation in this area reduces bureaucracy, saves time, and enhances transparency. Benaida (2023) found that mobile websites in North Africa faced usability issues like slow loading and limited feedback, affecting satisfaction. This reflects the importance of optimizing mobile platforms as smartphone use increases. Prastya et al. (2023) evaluated a local government website using the DeLone and McLean model and found that information and service quality positively influenced satisfaction more than system quality. This suggests users value clear, useful information and fast service over technical complexity. Anthopoulos and Sirakoulis (2015) conducted a cross-country comparison of portals like USA.gov and Gov.uk. They concluded that good layouts, simple navigation, and frequent content updates led to better user feedback. Personalized services and multilingual support also boosted public trust. Overall, citizen satisfaction depends not only on technical performance but also on how well services match daily needs. Only three papers studied G2B services, which facilitate government interaction with the private sector, such as licensing and procurement. Though less researched, G2B sites are vital for economic processes. Hashim et al. (2022) found that Malaysia's e-Perolehan system benefited from good design and training support. Ibrahim et al. (2023) noted the need for simple, functional interfaces. Ramantoko and Irawan (2017) found satisfaction was shaped by trust, responsiveness, and reliability. These studies show that business users have distinct needs, requiring systems tailored to their context.

Four studies addressed G2E services that assist government staff in tasks like reporting, leave requests, and accessing internal systems. Firdaus and Zakiah (2021) studied a mobile app used in Indonesian prisons and found it useful, though needing improvements. Kontogiannatou et al. (2019) found that systems aligned with employee routines improved satisfaction. Del Pilar et al. (2024) showed Philippine officials were satisfied if the system was easy to use and effective. G2E systems must be reliable, process-integrated, and institution-specific. None of the 54 studies discussed G2G services, which support inter-agency communication and coordination. Examples include the U.S. National Data Exchange (NDX), the EU's IMI system, or Indonesia's SPBE platform. The absence of G2G-focused research is notable, given the importance of such systems to operational government efficiency. While G2C, G2B, and G2E platforms serve external or internal users, G2G systems work in the background to ensure integration. Satisfaction here may depend on cooperation levels, compatibility, and data sharing ease. As complex

and less visible tools, future studies should explore how to assess satisfaction in G2G settings to improve their effectiveness in digital governance.

CONCLUSION

This systematic literature review covered 54 articles from 2008 to 2024 to explore key determinants of user satisfaction in e-government services. The findings were organized into six research questions that provided a comprehensive overview of how satisfaction is formed, measured, and determined in digital governance. For RQ1, the most cited determinants were usability, information quality, service quality, ease of use, and effectiveness highlighting the need for user-centered design alongside technical performance. RQ2 confirmed that while accessibility was rarely studied independently, it was often evaluated through broader usability testing. A total of 32 studies assessed both usability and accessibility, showing that mobile responsiveness and interface simplicity greatly impact user experience. RQ3 found that the ISO 9241 usability standard was the most used model, followed by the Information Systems Success Model and the Technology Acceptance Model, all offering strong analytical frameworks. RQ4 indicated that quantitative surveys were the most common method, followed by mixed-methods approaches that combined statistical analysis with user-focused insights. RQ5 identified recurring challenges such as technical limitations, poor interface design, infrastructure gaps, weak organizational coordination, and lack of user feedback mechanisms—issues especially prevalent in developing countries.

RQ6 showed that most papers (46 out of 54) focused on Government-to-Citizen (G2C) services, with far fewer exploring Government-to-Business (G2B) or Government-to-Employee (G2E), and none covering Government-to-Government (G2G) systems. This gap opens opportunities for future studies to address underexplored but critical areas of digital governance. Policy implications from this review suggest that governments should emphasize accessibility, digital literacy, and user-friendly design. Establishing citizen-centered guidelines, encouraging inter-agency collaboration, and collecting regular user feedback would help enhance satisfaction. This study has limitations. It relied on peer-reviewed articles in English, possibly excluding relevant local or grey literature. The studies varied in sample size, quality, and context, which may affect generalizability. Additionally, the review focused on end- user perspectives and did not incorporate the views of developers, government staff, or policymakers. Political, cultural, and legal influences on digital service use were also not examined. Lastly, the review is descriptive and thematic but lacks meta-analysis or statistical validation to confirm the patterns observed.

Table 7. Future Research Directions on User Satisfaction in E-Government Services

Area of Research	Description
Accessibility as a Standalone Construct	Investigate the independent effect of accessibility (e.g., WCAG compliance, inclusive design) on user satisfaction.
G2G Service Environment	Satisfaction in Government-to-Government (G2G) contexts remains underexplored and should be examined with appropriate frameworks.
Longitudinal Trends	Future work should examine how user satisfaction evolves over time across digital policy cycles and infrastructure updates.
Cross-Cultural Comparative Studies	More research is needed to understand how cultural and contextual differences shape digital service expectations, trust, and satisfaction.
New and Emerging Technologies	The role of AI-based personalization, chatbots, and conversational interfaces in influencing satisfaction must be explored using new evaluation models.

Policy and Design Implications	Studies should link empirical satisfaction outcomes with policy feedback loops and interface design strategies to ensure relevance and usability.

Table 7 suggests several directions for future research. It is essential to more thoroughly investigate the role of accessibility as a separate factor, study user satisfaction specifically in government-to-government (G2G) service settings, and explore how satisfaction changes over time throughout policy cycles. Additionally, comparative studies across different cultures are needed to understand better how local contexts influence people's expectations and experiences with digital services. Moreover, new technologies like conversational interfaces and AI-driven personalization offer fresh opportunities to measure satisfaction in next-generation e-government systems. Overall, this review provides a solid, evidence-based reason for researchers, designers, and policy-makers to improve e-government services so they better meet the needs and expectations of citizens.

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