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Impact of government digital transformation on citizen trust and participation: evidence from Gowa Regency, Indonesia

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This study examines the relationship between digital transformation, trust in government, and citizen participation in Gowa Regency, Indonesia, a region marked by urban–rural disparities. Drawing on a survey of 394 respondents across urban, semi-urban, and rural districts, the research employs descriptive and inferential statistical analysis, including ordinary least squares regression, to investigate how perceptions of digital public services influence trust and participatory behaviors. Findings reveal that digital transformation significantly enhances both trust in government and participation, while trust itself emerges as a strong predictor of citizen participation. However, participation levels remain modest, highlighting a persistent gap between positive perceptions of digital services and actual civic involvement. Spatial differences further complicate the picture: urban areas report higher digital transformation and trust scores, yet participation peaks in transitional zones, suggesting complex socio-structural dynamics. These results underscore that while digital transformation can foster institutional trust, its participatory potential requires complementary strategies addressing inclusivity, literacy, and feedback mechanisms. The study contributes to debates on digital governance by demonstrating that technology alone does not guarantee democratic responsiveness, but its impact is contingent on local contexts and the mediating role of trust.

KEYWORDS

digital transformation, trust in government, citizen participation, digital governance, urban–rural disparities, Indonesia

1 Introduction

The 21st century has been marked by profound transformations in governance, with digital technology emerging as a central driver of administrative reform, transparency, and participatory practices (Greve, 2015). Governments worldwide are increasingly deploying digital platforms to enhance efficiency, accountability, and public engagement (Agostino et al., 2022; Balaji, 2025). In Indonesia, momentum toward digital governance accelerated in the early 2000s, notably following Presidential Instruction No. 3 of 2003 on e-government development, which formally embedded information and communication technology (ICT) in governance strategies. Since then, both national and local governments have experimented with digital platforms such as *Satu Data Indonesia*, SP4N-LAPOR!, and integrated service applications, signaling an institutional commitment to modernizing public service delivery (Latupeirissa et al., 2024; Setiawan et al., 2023). At the local level, Gowa Regency in South Sulawesi represents a significant site of digital experimentation, introducing Public Service

Malls (*Mal Pelayanan Publik*) and digitalized population administration systems.

The promise of digital transformation in public service delivery rests on its ability to expand access, reduce bureaucratic layers, and increase transparency. Scholars argue that digital platforms can streamline administrative procedures, minimize face-to-face interactions that often enable inefficiency or corruption, and foster more responsive governance (Latupeirissa et al., 2024). Yet, the outcomes of these technologies are highly contingent on local contexts. While urban centers often benefit from better infrastructure and digital literacy, semi-urban areas straddle between traditional and modern practices, and rural regions frequently lag due to structural limitations. This uneven geography of digital transformation raises questions about inclusivity, equity, and the differentiated citizen experiences across regions such as those found in Gowa.

Digital transformation is frequently associated with expanding opportunities for citizen participation. Digital platforms enable governments to collect feedback, crowdsource ideas, and engage citizens through mechanisms broadly captured under the term e-participation (Aichholzer and Rose, 2020; Kassen, 2021). In practice, these tools allow communities to voice grievances, evaluate services, or join consultations via online portals, mobile applications, and interactive forums. However, participation through digital means is unevenly distributed and often shaped by socio-demographic and institutional factors, including digital literacy, access to infrastructure, and perceived responsiveness of government (Adni et al., 2024). In Indonesia, urban residents tend to use online systems more actively, while semi-urban and rural populations continue to rely on manual processes or intermediaries, producing disparities in participatory outcomes (Onitsuka et al., 2018).

Equally critical is the relationship between digital transformation and trust in government. Trust represents a cornerstone of democratic legitimacy and effective governance, influenced by perceptions of transparency, efficiency, and fairness (Ramadhani et al., 2025). Digital systems, by documenting transactions and reducing discretionary decision-making, can help reduce corruption and foster a perception of fairness. Cross-national evidence suggests that effective e-government systems are positively correlated with higher citizen trust (Virnandes et al., 2024). Yet, in Indonesia, this linkage remains underexplored at the subnational level, where governments face uneven capacity, infrastructure, and citizen readiness.

Trust in government also functions as a mediating factor that links digital transformation to citizen participation. Participation is not merely a matter of access or availability of digital tools, but also of willingness, which is strongly shaped by whether citizens believe their government is responsive and trustworthy (Kassen, 2021; Latupeirissa et al., 2024). In contexts where trust is low, citizens may perceive digital mechanisms as symbolic rather than substantive, reducing their likelihood to engage meaningfully. Conversely, when trust is strengthened by transparent and efficient digital services, citizens are more likely to participate, thereby reinforcing democratic responsiveness. Understanding this triangular relationship—digital transformation, trust, and participation—provides a more holistic view of governance in the digital era.

Gowa Regency offers a compelling empirical setting to analyze these dynamics. With its territorial diversity spanning urban, semi-urban, and rural areas, Gowa mirrors the infrastructural and socio-economic disparities found across Indonesia. Its proximity to Makassar, a hub of digital innovation, further situates Gowa at the intersection of central and peripheral digitalization processes. Yet, despite its ambitious digital initiatives, research on how these reforms affect both citizen trust and participation at the local level remains limited. Existing studies have largely emphasized technical efficiency or policy integration, without fully addressing the relational and democratic implications (Setiawan et al., 2023). Although the empirical site is local, the Indonesian context offers globally significant insights. Indonesia is the world's third-largest democracy and one of the most decentralized governance systems, facing the universal challenge of translating digital transformation into trust and participation across unequal territories. Studying Gowa thus provides an analytical vantage point for understanding how digital governance evolves in contexts characterized by institutional diversity, infrastructural asymmetry, and socio-cultural pluralism.

This study addresses that gap by investigating the impact of digital transformation in public services on both citizen trust and participation in Gowa Regency. Specifically, it examines how experiences differ across urban, semi-urban, and rural contexts, and how trust mediates the relationship between digital service use and participatory engagement. The study contributes to the broader literature on digital governance and provides policy-relevant insights for strengthening inclusiveness, legitimacy, and democratic responsiveness in Indonesia's decentralized governance system.

2 Literature review and theoretical framework

2.1 Digital transformation in public services

Referred to interchangeably as e-government, digital government, or digital transformation, this evolution extends beyond digitizing existing processes; it encompasses strategic adoption of digital technologies to reorganize internal operations, enhance service delivery, and strengthen institutional engagement with the public (OECD, 2020, 2024). The OECD's Digital Government Policy Framework conceptualizes this transformation through six dimensions: digital by design—rethinking services from end-to-end; data-driven public sector—embedding evidence-based decision-making; government as a platform—building interoperable and reusable infrastructure; open by default—ensuring transparency; user-driven—prioritizing citizen needs; and proactiveness—anticipating needs (OECD, 2020, 2021). The World Bank similarly defines digital government as the strategic use of ICT to transform how governments relate to citizens, businesses, and other government entities, aiming to boost access, participation, and democratic legitimacy (World Bank, 2016). This evolution reframes digitalization not merely as a technical enhancement but as a holistic re-engineering of governance practices at all levels (Yang et al., 2024).

The terminology surrounding this field reflects the historical and conceptual broadening of how technology interacts with governance. E-government generally refers to the first generation of ICT integration in the public sector, focusing on efficiency, automation, and online service delivery (Heeks and Bailur, 2007). It emphasizes the electronic interface between governments and users—citizens (G2C), businesses (G2B), or other government agencies (G2G)—primarily as a means to improve service efficiency and reduce administrative costs.

By contrast, digital government represents a second generation that goes beyond service delivery to include data-driven decision-making, interoperability, and open governance. It focuses on the systemic use of digital infrastructures to promote transparency, collaboration, and innovation in policymaking (OECD, 2021). Digital government thus integrates technological and institutional change, aligning digital tools with broader principles of public value creation and accountability (Cordella and Paletti, 2019).

Digital transformation denotes the third and most comprehensive stage of this evolution. It captures not only technological or institutional adaptation but also a paradigm shift in governance logic—from hierarchical and bureaucratic management toward networked, participatory, and co-creative governance models (Mergel et al., 2019). In this sense, digital transformation embodies the convergence of technology, culture, and organizational reform that reshapes state–citizen relations. This broader framing is particularly relevant to emerging democracies like Indonesia, where digital reforms must negotiate diverse institutional capacities, infrastructural gaps, and socio-cultural heterogeneity.

Digital transformation in public services has emerged as a defining feature of contemporary governance, reshaping the relationship between governments, citizens, and institutions. Early studies framed this development under the umbrella of e-government, emphasizing the use of information and communication technologies (ICTs) to enhance service delivery, transparency, and citizen engagement (Seo and Bernsen, 2016; West, 2004). These works highlight how digital technologies promise to streamline bureaucratic processes, reduce transaction costs, and increase efficiency. Yet, they also underline challenges of uneven adoption, digital divides, and institutional resistance that often limit the full realization of e-government's transformative potential.

Recent scholarship emphasizes that digital transformation is not simply a matter of adopting ICTs but represents a deeper institutional and organizational shift in how public services are designed and delivered (Filgueiras et al., 2019; Pinheiro et al., 2025). For example, in Brazil, the transition from e-government to digital governance is framed as a process of institutional change, in which public agencies recalibrate roles, preferences, and coordination mechanisms in order to deliver citizen-centered services. Similarly, research in developing countries demonstrates that success factors for public sector information system projects go beyond technical capacity and include managerial leadership, social participation, and institutional readiness, underscoring the socio-technical complexity of digital reforms.

A growing body of evidence shows that digital transformation contributes significantly to public service outcomes such as quality, equality, and inclusivity. In Ghana, e-government initiatives improved efficiency, cost-effectiveness, and citizen satisfaction, although infrastructural challenges such as weak ICT systems and low digital literacy remain serious barriers (Osei-Kojo, 2017). In China, integrated e-government has been shown to enhance both the quality and equity of public services across provinces by promoting administrative efficiency, technological innovation, and resource sharing (Mao and Zhu, 2025). Complementary studies on mobile government apps (MGApps) further illustrate how digital platforms narrow urban–rural income gaps by increasing accessibility to services for marginalized communities (Chen and Ye, 2025). Digital transformation is closely linked with democratic responsiveness and political communication. Research across 35 countries shows that higher e-government capacity can reduce ideological polarization by fostering more transparent and participatory governance environments (Danowski, 2025). This aligns with broader findings that digitization not only improves efficiency and citizen experience but also reshapes trust, accountability, and civic engagement in governance (Latupeirissa et al., 2024).

2.2 Trust in government and public institutions

Trust in government is widely recognized as a cornerstone of democratic legitimacy and effective governance, particularly in the era of digital transformation. In the Indonesian context, initiatives such as *Satu Data Indonesia*, *SP4N-LAPOR!*, and local service platforms like the *Mal Pelayanan Publik (MPP)* in Gowa Regency illustrate government efforts to strengthen accountability and transparency. These digital platforms not only streamline service delivery but also introduce feedback loops where citizens can submit complaints, track requests, and evaluate services, fostering perceptions of government openness and competence (Setiawan et al., 2023).

At its core, trust in government refers to citizens' confidence that public institutions will act fairly, effectively, and in alignment with the public interest (Mahmud, 2024). In the digital domain, e-government has been heralded as a mechanism for enhancing trust through improved transparency, efficiency, and citizen engagement. Evidence from Thailand shows that trust is the most decisive factor influencing citizens' adoption of e-government, mediating the link between concerns about privacy/security and willingness to engage with digital services (Nookhao and Kiattisin, 2023). Conversely, studies in China highlight that the relationship is complex: while e-government can enhance trust indirectly via improved perceptions of government integrity and responsiveness, unmet expectations may erode it (Li and Shang, 2023).

Research further underscores the mediating role of transparency. A study in Jordan found that dimensions of e-government—such as information quality, automation, and digital service delivery—strengthen transparency, which in turn fosters institutional trust (Aldiabat et al., 2025). Similarly, classic findings by Welch (2004) emphasized that citizen satisfaction with online services—particularly their interactivity and openness—strongly correlates with higher levels of trust. Beyond transparency and service quality, data security and privacy remain fundamental. In the Netherlands, Beldad et al. (2012) found that institutional reputation and secure handling of citizen data directly influence public trust in government organizations. Without robust safeguards, even advanced digital systems risk undermining legitimacy. Several broader strands of literature complement this picture. Studies on citizen participation show that while citizens express high willingness to engage digitally, actual participation remains low in Indonesia and Malaysia (<40%), revealing a gap between institutional design and public involvement (Napitupulu et al., 2019). Axelsson et al. (2010) argue that e-government projects often treat citizens as passive recipients rather than active co-creators, undermining participatory legitimacy. A recent systematic review confirms that most e-participation research still privileges technical and political dimensions, overlooking psychological and social factors critical to sustaining trust and engagement (Benlahcene et al., 2024).

From a governance innovation perspective, scholars stress that the value co-creation model—grounded in dialog, access, transparency, and risk assessment (the DART framework)—offers a pathway for governments to build reciprocal trust and shared legitimacy with citizens (Guo and Zhang, 2024). Comparative studies reinforce this: global evidence indicates that e-participation improves voice and accountability, particularly in least-developed countries where digital engagement directly enhances citizens' political rights and oversight capacity (Mao et al., 2025). At the local level, municipal e-government platforms provide critical spaces for information dissemination and interaction. Portuguese municipalities, for instance, have increasingly adopted online tools such as complaint offices, forums, and social media to promote transparency and foster participation, though larger municipalities tend to lead such innovations (Tejedo-Romero et al., 2023). Similarly, Conroy and Evans-Cowley (2005) note that ICT tools in urban planning enhance participation but must be designed to overcome barriers of access and timing.

2.3 Citizen participation in the digital era

The advent of digital transformation has reshaped the contours of citizen participation, altering conventional mechanisms of engagement into more dynamic, interactive, and decentralized practices. Digital participation—or e-participation—entails the use of information and communication technologies (ICTs) to enhance public involvement in decision-making and governance processes (Macintosh, 2004; Medaglia, 2012). This shift has broadened opportunities for inclusivity, yet it simultaneously presents significant challenges related to access, equity, and institutional design.

In practice, e-participation manifests in various modalities, including e-voting, online consultations, and digital participatory budgeting, which have been increasingly adopted worldwide (Falco and Kleinhans, 2018; OECD, 2020). Beyond these institutionalized mechanisms, civic technology tools—such as open data portals, complaint applications, and interactive mapping systems—play a central role in enabling transparency and accountability (Mao et al., 2025; Schrock, 2016). In Indonesia, the LAPOR! platform exemplifies how governments integrate civic tech into national governance frameworks to channel grievances and strengthen responsiveness (Febriani et al., 2024). Recent literature, however, emphasizes that successful e-participation requires moving beyond technological provision toward value co-creation between governments and citizens. As Guo and Zhang (2024) argue, the transformation into "digital government" demands dialogical interaction, access, transparency, and risk assessment (the DART model) to foster sustained citizen involvement and co-construction of governance. Similarly, Benlahcene et al. (2024) note that while technical and political dimensions dominate existing studies, psychological and social factors—such as trust, sense of efficacy, and inclusiveness—remain equally critical to sustaining engagement.

E-participation contributes positively to voice and accountability, especially in least-developed countries where digital mechanisms may offer citizens new avenues for political expression and oversight (Mao et al., 2025). Nonetheless, challenges persist: unequal access to technology, low digital literacy, and technocratic platform design often limit meaningful engagement (Peixoto and Fox, 2016; van Deursen and Helsper, 2015). For instance, Napitupulu et al. (2019) found that although interest in digital participation in Indonesia and Malaysia exceeds 90%, actual involvement remains below 40%, underscoring the gap between potential and practice. Moreover, studies at the local government level highlight that institutional size and resources significantly influence the scope of e-participation. Larger municipalities tend to adopt more advanced participatory tools compared to smaller ones (Rusli et al., 2024; Tejedo-Romero et al., 2022). Sustaining long-term participation also depends on fostering a sense of virtual community, where citizens feel affective attachment to digital participatory spaces (Naranjo-Zolotov et al., 2019). Without such social anchoring, e-participation risks becoming episodic rather than transformative.

Citizen participation in the digital era cannot be reduced to merely providing online platforms. It must be understood as a socio-technical process shaped by digital access, literacy, trust, and institutional design. While digital transformation expands the participatory landscape, it may simultaneously reproduce or intensify inequalities if structural and psychological barriers are left unaddressed. Thus, effective e-participation requires integrative strategies that combine technological innovation, inclusive governance, and the co-creation of value between governments and citizens.

2.4 Theoretical frameworks and models

Digital transformation in public services provides the entry point for understanding new patterns of citizen–state interaction. At the individual level, technology adoption models such as the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) explain how perceived usefulness, ease of use, social influence, and institutional support shape citizens' willingness to engage with e-government platforms. Studies show that when services are user-friendly, well-supported, and embedded in enabling infrastructures, citizens are more likely to adopt them (Aleisa, 2024; Sabani et al., 2023). These models highlight how digital transformation can facilitate the initial connection between governments and citizens by lowering barriers to access.

The implications of digital transformation, however, extend beyond adoption to the domain of trust in government. Trust theory conceptualizes confidence in institutions as grounded in perceptions of competence, fairness, and ethical conduct (Bustos, 2021; Choudhury, 2008). In digital governance, the design and performance of online platforms—particularly in terms of transparency, data security, and responsiveness—play an important role in shaping this trust. When citizens believe that digital systems are secure, their feedback is taken seriously, and government actors act upon their input, trust in government is strengthened (Wirtz and Birkmeyer, 2018). Conversely, poorly designed platforms or unresponsive institutions can erode trust, regardless of technological sophistication.

Trust also connects to broader social dynamics through the lens of social capital. As Putnam (1994) argues, networks of reciprocity and norms of trust facilitate collective engagement, including in digital spaces. Communities with strong interpersonal and institutional trust are more inclined to use digital tools for civic purposes, whereas limited networks or unequal access may reinforce exclusion (Helsper, 2021; Mandarano et al., 2010; van Deursen and Helsper, 2015). Thus,

digital transformation does not automatically generate trust; rather, it interacts with existing social structures that either enhance or constrain citizen confidence in government.

Finally, the link between trust and participation is captured by frameworks of participatory governance and digital democracy. These approaches emphasize that digital tools can expand deliberative opportunities, reduce participation costs, and strengthen accountability when institutions are responsive and inclusive (Bhanye and Shayamunda, 2024). In contexts such as Indonesia's Musrenbang, digital platforms have been introduced to broaden participation, though their effectiveness depends on whether governments genuinely act on citizen input (Nurmandi et al., 2015). At the same time, scholars warn against techno-solutionism, stressing that digital democracy requires not just technical innovation but also institutional reform to address inequality and exclusion (Jonsson and Mósesdóttir, 2023). In this sense, digital transformation influences democratic governance indirectly: it shapes trust in government, which in turn conditions citizens' willingness to participate.

3 Methods

3.1 Study setting

This study was conducted in Gowa Regency, South Sulawesi, a district that forms part of the Makassar metropolitan area. The regency presents a diverse socio-economic and spatial landscape that ranges from dense urban centers to transitional peri-urban zones and rural hinterlands. Such heterogeneity makes Gowa a relevant case for analyzing how digital public services operate under different infrastructural and demographic conditions, especially in relation to access, participation, and institutional responsiveness. Administratively, Gowa comprises 18 districts with varying levels of internet penetration, service delivery mechanisms, and citizen engagement, reflecting both the opportunities and challenges of uneven urban expansion driven by its proximity to Makassar City.

To capture this variation, the study focuses on three representative districts (Figure 1): Somba Opu (urban), Pallangga (semi-urban/transition), and Bajeng (rural). Somba Opu, located adjacent to Makassar, functions as the regency's administrative and economic hub. With higher levels of infrastructure, commercial activity, and digital literacy, it has become the leading site for adopting innovations such as one-stop service centers, licensing applications, and digital complaint mechanisms (Setiawan et al., 2023). In contrast, Pallangga represents a semi-urban transition zone characterized by mixed residential and agricultural land use, where ongoing infrastructure development coexists with persistent gaps in digital access and literacy. Bajeng, a rural district further from the urban core, is dominated by agricultural livelihoods and limited broadband infrastructure, where digital innovations have been introduced more slowly, mainly through programs like village information systems, mobile service units, and electronic ID campaigns (Anas et al., 2024).

The selection of these districts allows for a comparative analysis across urban, semi-urban, and rural contexts. This tripartite approach highlights how geographical and socio-economic variation mediates the relationship between digital transformation, trust in government, and citizen participation. Differences in infrastructure, service delivery capacity, and community networks not only shape digital adoption but also influence perceptions of fairness, responsiveness, and inclusivity in governance. In this sense, Gowa reflects the importance of spatial justice and differentiated governance capacity in

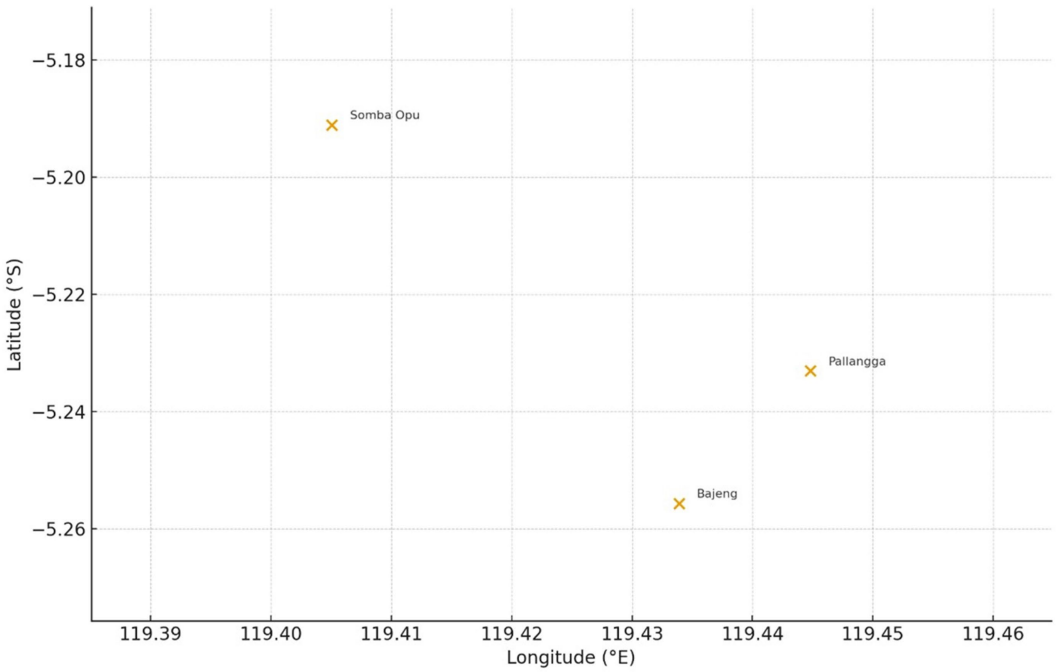

FIGURE 1
Study area locator map Somba Opu, Pallangga, and Bajeng (Gowa regency, South Sulawesi).

understanding the uneven impacts of digital transformation (Gil-Garcia et al., 2018; Setiawan et al., 2023; Surya et al., 2020).

Gowa's position within Indonesia's national push for e-government—through programs such as SPBE (*Sistem Pemerintahan Berbasis Elektronik*) and MPP (*Mal Pelayanan Publik*)—adds to its significance as a research site. While the regency has actively experimented with platforms for licensing, population administration, complaint handling, and participatory planning, the reach and effectiveness of these initiatives remain uneven.

3.2 Data collection

This study employed a quantitative design using a structured survey to capture citizen experiences with digital public services in Gowa Regency (*Somba Opu, Pallangga, Bajeng*). The questionnaire items were adapted from validated instruments in prior studies on e-government service experience, digital trust, and e-participation (Aichholzer and Rose, 2020; Kassen, 2021). Three main constructs were measured (Table 2): digital transformation (10 items), trust in government (7 items), and citizen participation (7 items). All items were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Digital transformation captured citizens' experiences with accessibility, usability, responsiveness, and inclusiveness of government digital services. Trust in government reflected perceived integrity, competence, and fairness of government in providing digital services, while citizen participation represented citizens' engagement and expression through digital platforms. Each construct was modeled as a reflective latent variable. Given the conceptual scope of digital transformation and trust, they were treated as second-order constructs with theoretically grounded dimensions (accessibility–responsiveness–inclusiveness for digital transformation; integrity–competence–fairness for trust). Although exploratory factor analysis (EFA) was not performed due to the limited sample size and the use of previously validated instruments, the constructs have been theoretically and empirically supported in prior studies (e.g., Aichholzer and Rose, 2020; Kassen, 2021). Internal consistency reliability was confirmed through Cronbach's alpha, with all values exceeding 0.70, which supports construct coherence.

The selected districts reflected the urban–rural continuum in terms of administrative classification, infrastructure, population density, and digital service penetration. Within each district, sub-districts (*kelurahan*) or villages (*desa*) were randomly selected from official administrative records, and households were systematically sampled with proportional allocation to population size (Sedgwick, 2015). The final sample comprised 394 respondents: 154 from Somba Opu, 156 from Pallangga, and 83 from Bajeng, ensuring variation in socio-demographic profiles such as age, gender, education, and occupation.

Data were collected through face-to-face structured interviews conducted over 4 weeks by trained enumerators (Rutledge and Hogg, 2020). While online surveys are common in urban contexts, in-person administration was deemed more appropriate given uneven digital literacy and internet access across semi-urban and rural areas. The questionnaire drew on validated instruments and measured key constructs including digital service use (frequency, ease, satisfaction), civic participation (e.g., complaint platforms, public consultations), and trust in local government (integrity, competence, fairness, transparency), along with demographic characteristics.

Anonymity and confidentiality were strictly maintained, with respondents given the right to withdraw at any time. By combining multi-stage random sampling, proportional representation, and face-to-face interviews, the study generated a robust dataset that reflects the varied realities of digital service access and governance experiences across urban, transitional, and rural communities in Gowa Regency.

TABLE 1 Profile of respondents.

Variables	Indicators	*X*	Me	SD	Min.	Max.
Age	Years	34.45	30.00	11.77	17.00	63.00
Education	Years of schooling	13.12	12.00	2.16	6.00	20.00
Income	Income per month (USD)	222.75	217.37	117.55	60.38	905.69
Internet use	Internet use per day	3.10	3.00	1.02	1.00	5.00

Variables	Indicators	*f*	%
Areas	Urban	154	39.18
	Transition	156	39.69
	Rural	83	21.13
Gender	Female	164	41.75
	Male	230	58.25
Occupation	Public servant	63	15.98
	Private employees	118	29.9
	Self-employed	138	35.05
	Farmers/fishermen/laborers	22	5.67
	Homemaker	53	13.4

3.3 Data analysis

The analysis of this study was conducted in three main stages to examine how digital transformation in public services influences citizen trust in government and participation across the urban–rural spectrum of Gowa Regency. First, descriptive statistics were used to summarize key demographic variables and indicators of digital service use, trust, and participation, while cross-tabulations highlighted spatial variations among Somba Opu (urban), Pallangga (semi-urban), and Bajeng (rural). This step not only provided a baseline profile of the respondents but also revealed contextual differences in access and attitudes that are essential for interpreting empirical results.

The inferential phase employed multivariate regression modeling to examine the strength and direction of the relationships among the constructs. Ordinary least squares (OLS) regression was applied in two steps. In the first step, the model estimated the effect of digital transformation on participation while controlling for rural and transition residence (urban as the reference category), gender, age, education, income, and internet use (see Equation 1). In the second step, the model incorporated trust in government as a moderating variable, testing both its direct effect on participation and its interaction with digital transformation (see Equation 2). Multicollinearity was assessed using variance inflation factor (VIF) scores (all < 5), ensuring sufficient independence among predictors, while additional diagnostic tests confirmed that the key assumptions of OLS regression were met (Thompson et al., 2017).

$$y_1 = \beta_{1,0} + \beta_{1,1}\chi_1 + \beta_{1,2}\chi_3 + \ldots + \beta_{1,8}\chi_8 + \varepsilon_1 \quad (1)$$

$$y_1 = \beta_{2,0} + \beta_{2,1}\chi_1 + \beta_{2,2}\chi_2 + \beta_{2,3}\left(\chi_1 \text{ x } \chi_2\right) + \ldots + \beta_{2,10}\chi_{10} + \varepsilon_2 \quad (2)$$

where y_1 is participation, χ_1 is an indicator of digital transformation, χ_2 is trust in government. $\beta_{1,0}$ and $\beta_{2,0}$ are the intercept terms, $\beta_{1,1}, \beta_{1,2}, \beta_{1,n}$ and $\beta_{2,1}, \beta_{2,2}, \beta_{2,n}$ are the slope coefficients for participation, χ_3 to χ_{10} are the covariates, and ε is the random error term. This layered strategy—descriptive analysis, inferential regression with robustness checks, and mediation modeling—allowed for a rigorous and context-sensitive understanding of how digital transformation reshapes citizen–state relations in Indonesia.

4 Results and discussion

This result aligns with existing theoretical expectations in digital governance and public trust literature. As emphasized by Mergel et al. (2019) and Tolbert and Mossberger (2006), the integration of digital tools can strengthen institutional legitimacy when they enhance transparency and usability. Similarly, Lember et al. (2019) argue that digital transformation is not merely a technological process but also a relational mechanism that reshapes citizen–state interaction. This theoretical lens situates the Indonesian local context—particularly semi-urban and rural areas—as a fertile ground to observe how digital initiatives interact with social structures and governance capacity.

4.1 Profile of respondents

The respondents in this study represent a diverse demographic, socioeconomic, and occupational composition, which provides an important basis for analyzing patterns of digital engagement and public service interaction (Table 1). The average age of respondents was 34.45 years (median = 30, SD = 11.77), with a wide distribution ranging from 17 to 63 years. This indicates the inclusion of both younger and older cohorts, an important aspect given that age is consistently reported as a moderating factor in technology adoption and e-government use (Mensah and Mi, 2019; Schaupp and Carter, 2005). Younger respondents are generally more open to new technologies, whereas older individuals may display more selective or cautious use of digital platforms, highlighting generational differences in adoption dynamics.

In terms of educational attainment, the sample recorded an average of 13.12 years of schooling (median = 12, SD = 2.16), equivalent to the completion of secondary school and extending up to university-level education. This relatively high average level of education is significant, as previous research has shown education to be a strong determinant of digital literacy, internet skills, and the ability to extract meaningful benefits from online services (van Deursen and Helsper, 2015). Consequently, the sample reflects a population that is generally well-equipped to engage with complex online government platforms, including functions such as complaint submission, document uploads, and service tracking.

The respondents' monthly income (USD) averaged 222.75 (median = 217.37; SD = 117.55), with reported earnings ranging from 60.38 to approximately 905.69. Income variation is notable, as economic capacity influences the affordability of devices and internet subscriptions, as well as the time and resources available for developing digital skills (van Dijk, 2019). Literature on the "third-level digital divide" further stresses that differences in income not only affect access but also shape the extent to which individuals can convert internet use into tangible social, economic, and political benefits (van Deursen and Helsper, 2015; Wei et al., 2011). Thus, the income spread in this study suggests potential inequality in the outcomes of e-government usage across socioeconomic groups.

The pattern of internet use per day among respondents reflects a moderate to high level of engagement, with a mean score of 3.10 (median = 3.00; SD = 1.02) on a five-point scale, and a range between 1 and 5. Frequent and routinized internet use has been found to predict more complex forms of engagement, including information-seeking, civic participation, and transactional interactions with government (Bataineh and Abu-Shanab, 2016; Lean et al., 2009). While frequency alone does not guarantee effective engagement, it suggests a baseline of digital familiarity across the sample, which is a critical precondition for fostering more sophisticated forms of e-service interaction.

Geographically, respondents were drawn from urban (39.18%), transitional/peri-urban (39.69%), and rural (21.13%) areas. This distribution ensures a balanced perspective on infrastructural and contextual differences in digital adoption. The literature on digital divides emphasizes that urban residents typically benefit from superior internet infrastructure, while rural communities face both access-related and skills-related barriers (Chen and Ye, 2025; Onitsuka et al., 2018; Seo and Bernsen, 2016). Transitional zones often exhibit hybrid patterns: infrastructure conditions closer to urban standards

TABLE 2 Descriptive analysis of digital transformation, trust in government, and participation.

Variables	*X*	Me	SD	Min.	Max.
Digital transformation	*3.93*	*4.00*	*0.68*	*1.40*	*5.00*
I find digital public services easy to access.	4.27	5.00	0.94	1.00	5.00
I can use digital public services without any assistance.	4.10	4.00	1.06	1.00	5.00
The homepage or display of digital services is easy to understand.	4.09	4.00	0.95	1.00	5.00
The time required to complete tasks through digital services is relatively short.	4.07	4.00	0.94	1.00	5.00
Digital public services have largely replaced the need for physical visits to government offices.	4.16	4.00	0.82	2.00	5.00
Government digital services are responsive to my concerns or complaints.	3.70	4.00	0.88	1.00	5.00
I trust that government digital services keep my personal data secure.	4.05	4.00	0.93	1.00	5.00
Government digital services operate transparently and without making things difficult.	4.01	4.00	0.81	1.00	5.00
I feel that all groups in society have equal opportunities to access digital services.	3.72	4.00	1.09	1.00	5.00
The government provides sufficient information and education on how to use digital services.	3.13	3.00	1.26	1.00	5.00
Trust in government	*3.91*	*4.00*	*0.70*	*1.00*	*5.00*
I believe the government is serious about developing digital-based public services.	3.81	4.00	1.05	1.00	5.00
I feel the government is responsible for the quality of the digital services it provides.	4.05	4.00	0.87	1.00	5.00
Digital public services increase my trust in government institutions.	3.86	4.00	0.88	1.00	5.00
I believe my personal data will not be misused by the government.	3.98	4.00	0.97	1.00	5.00
I feel that government digital services are fair to everyone.	3.73	4.00	0.94	1.00	5.00
I have more trust in government agencies that actively innovate digitally.	3.99	4.00	0.87	1.00	5.00
My positive experiences with digital services have increased my trust in government in general.	3.94	4.00	0.92	1.00	5.00
Participation	*2.75*	*2.64*	*1.01*	*1.00*	*5.00*
I regularly use government digital services in my daily life.	2.94	3.00	1.16	1.00	5.00
I have submitted complaints, criticisms, or input through government applications or digital channels.	2.36	2.00	1.28	1.00	5.00
I follow public policy information through official government digital platforms.	2.95	3.00	1.29	1.00	5.00
I feel I have a space to participate in the public decision-making process through digital media.	2.79	3.00	1.26	1.00	5.00
I feel heard and cared for when I express my opinion on government digital platforms.	2.74	3.00	1.20	1.00	5.00
I feel that digital services encourage me to be more actively involved in public affairs.	3.02	3.00	1.19	1.00	5.00
I have participated in online discussion forums, polls, or public consultations.	2.41	2.00	1.35	1.00	5.00

Source: survey data.

but usage habits more reflective of rural constraints. By including these three categories, the study captures the heterogeneity of digital readiness and engagement across spatial contexts in Indonesia.

The gender distribution of the sample was fairly balanced, with women representing 41.75% and men 58.25% of respondents. Previous studies have found that gender differences in internet adoption and e-government use have narrowed considerably, particularly once education and income are controlled for Taipale (2013). Nevertheless, certain service domains may still reveal gendered patterns of use, especially where cultural expectations or caregiving responsibilities shape the relevance and accessibility of services. Finally, the sample demonstrates substantial occupational diversity, with the largest groups being self-employed individuals (35.05%) and private-sector employees (29.90%). Public servants accounted for 15.98%, while homemakers comprised 13.40% and farmers, fishermen, and laborers 5.67%. Prior studies suggest that occupational status influences the nature of online engagement: self-employed and private-sector workers often use digital platforms for economic and administrative purposes, public servants may be more familiar with bureaucratic systems, while primary-sector workers and homemakers are more vulnerable to access and skills-related barriers (Zhang, 2022). This occupational distribution thus enriches the analysis by reflecting multiple pathways through which digital technology intersects with livelihood, capacity, and governance participation.

This demographic pattern confirms earlier findings that digital readiness tends to be higher among younger, well-educated groups (van Deursen and Helsper, 2015; Mensah and Mi, 2019). However, the persistence of lower engagement in rural and lower-income settings illustrates what van Dijk (2019) describes as the "third-level digital divide," where access does not necessarily translate into participatory empowerment. Such findings underscore the contextual dimension of digital governance outcomes, reinforcing that trust and engagement are socially embedded. The respondent profile underscores a population with substantial digital potential due to relatively high education levels and moderate internet usage, but also reveals potential divides along age, income, and geographical lines. These findings align with broader evidence that e-government initiatives such as SP4N-LAPOR! in Indonesia must address not only the availability of platforms but also the institutional capacity to respond

effectively and equitably across different demographic groups (Saud and Margono, 2021).

4.2 Descriptive analysis

Table 2 shows a paradoxical situation: citizens express positive perceptions of digital transformation and relatively high trust in digital government, but participation remains limited. This pattern reflects broader debates in digital governance literature, where improvements in service delivery do not necessarily guarantee greater civic engagement (Mergel et al., 2019). The findings underscore the need for governments to not only enhance usability and trust but also actively foster participatory cultures and inclusive mechanisms to ensure that digital transformation contributes to democratic governance.

In detail, respondents generally rated digital transformation positively, with a mean score of 3.93 (SD = 0.68). Most indicators under this construct scored above 4.00, suggesting that citizens perceive government digital platforms as accessible, user-friendly, and efficient. For example, the statement "I find digital public services easy to access" received the highest mean of 4.27 (SD = 0.94), while "I can use digital public services without any assistance" also scored highly at 4.10 (SD = 1.06). These findings are consistent with prior studies emphasizing the importance of usability and accessibility in driving successful digital transformation in the public sector (Gil-Garcia et al., 2020; Lember et al., 2019). However, lower scores were observed for "The government provides sufficient information and education on how to use digital services" (M = 3.13, SD = 1.26), indicating gaps in digital literacy outreach, which may hinder inclusive adoption (Adni et al., 2024; Bertot et al., 2012; Latupeirissa et al., 2024).

In contrast, levels of participation through digital platforms were relatively low, with an average mean of 2.75 (SD = 1.01). The majority of indicators, such as "I have submitted complaints, criticisms, or input through government applications or digital channels" (M = 2.36, SD = 1.28) and "I have participated in online discussion forums, polls, or public consultations" (M = 2.41, SD = 1.35), suggest limited citizen engagement in interactive governance processes. While respondents acknowledge the availability of platforms, they rarely utilize them for active participation. This aligns with existing literature, which argues that digital participation often remains symbolic unless accompanied by institutional reforms and stronger feedback mechanisms (Pauluzzo et al., 2024; Peixoto and Fox, 2016). Interestingly, the indicator "I feel that digital services encourage me to be more actively involved in public affairs" had a relatively higher mean (M = 3.02, SD = 1.19), suggesting some potential for fostering civic engagement if barriers to participation are addressed.

Meanwhile, public trust in digital government services received a moderately high mean score of 3.91 (SD = 0.70). Respondents expressed confidence in government responsibility for service quality (M = 4.05, SD = 0.87) and in the fairness of digital services (M = 3.73, SD = 0.94). Similarly, the belief that personal data is protected scored relatively high (M = 3.98, SD = 0.97). These findings resonate with prior research showing that transparency, responsiveness, and data protection are critical drivers of digital trust (Aldiabat et al., 2025; Bhanye and Shayamunda, 2024; Tejedo-Romero et al., 2023). However, while trust levels are fairly robust, they may not automatically translate into higher digital participation, as seen in the gap between trust and actual engagement.

Figure 2 and Table 3 highlight notable variations in digital transformation, trust in government, and participation across rural, transition, and urban areas. In rural settings, the mean score for digital transformation is 3.71 (SD = 0.74), with values ranging between 1.40 and 5.00. Trust in government in rural areas shows a similar pattern, with a mean of 3.61 (SD = 0.74), while citizen participation records a considerably lower mean of 2.49 (SD = 0.92). These findings suggest that although rural residents perceive moderate levels of digital service implementation and government trust, their engagement in participatory practices remains relatively limited. Such trends are consistent with prior studies showing that infrastructural limitations, digital literacy barriers, and socioeconomic conditions often restrict rural communities' ability to translate trust and access into active civic involvement (Salemink et al., 2017).

In transition areas, both digital transformation (M = 3.97, SD = 0.65) and trust in government (M = 3.98, SD = 0.51) are reported at slightly higher levels compared to rural areas, with narrower variability. Participation, however, increases modestly to a mean of 2.83 (SD = 1.02). This pattern warrants deeper analysis. Transitional areas in Gowa—characterized by ongoing urbanization, expanding internet infrastructure, and persistent community-based social networks—tend to exhibit what Evans (1995) calls "embedded autonomy," where state

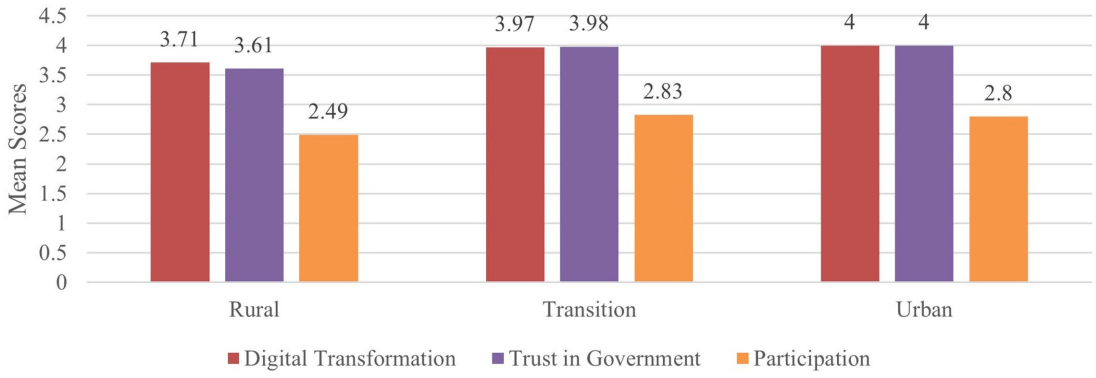

FIGURE 2
Descriptive analysis of digital transformation, trust in government, and participation by areas.

TABLE 3 Descriptive analysis of digital transformation, trust in government, and participation by areas.

Areas and variables	*X*	Me	SD	Min.	Max.
Rural					
Digital transformation	3.71	3.80	0.74	1.40	5.00
Trust in government	3.61	3.85	0.74	1.00	5.00
Participation	2.49	2.60	0.92	1.00	5.00
Transition					
Digital transformation	3.97	4.20	0.65	2.20	5.00
Trust in government	3.98	4.00	0.51	2.71	5.00
Participation	2.83	2.71	1.02	1.14	5.00
Urban					
Digital transformation	4.00	4.01	0.66	2.00	5.00
Trust in government	4.00	4.28	0.80	1.71	5.00
Participation	2.80	2.71	1.01	1.14	5.00

Source: survey data.

capacity and local engagement mutually reinforce each other. In these zones, digital initiatives introduced by local government are often supported by pre-existing social capital, neighborhood associations, and informal governance intermediaries (Michels and De Graaf, 2017). Such community structures serve as bridging mechanisms between traditional forms of participation and emerging digital channels. Moreover, residents in transitional zones often combine face-to-face interactions with online engagement—a phenomenon consistent with the concept of hybrid civic spaces (Sæbø et al., 2008). Unlike fully urbanized settings, where digital communication tends to be more individualized, semi-urban areas retain stronger collective orientations, making citizens more responsive to participatory invitations disseminated through digital media. This hybrid participation mode enables local governments to leverage both technological access and social trust to stimulate civic involvement.

In contrast, rural residents may face infrastructural and literacy barriers that inhibit digital engagement (van Dijk, 2019), while urban citizens—despite having better connectivity—may experience participation fatigue or perceive digital engagement as symbolic rather than consequential (Peixoto and Fox, 2016). The combination of improving infrastructure and cohesive local networks thus positions transitional areas as "sweet spots" for participatory innovation.

The higher levels of digital transformation and trust observed in transition zones can be explained by their intermediary position between rural and urban areas, where expanding infrastructure and exposure to government programs often enhance both service quality and citizen perceptions (van Dijk, 2019). Research on peri-urban and semi-rural regions also demonstrates that improvements in connectivity and governance accessibility foster a more positive citizen-state relationship, which in turn encourages civic participation (Sæbø et al., 2008).

In urban areas, digital transformation (M = 4.00, SD = 0.66) and trust in government (M = 4.00, SD = 0.80) reach their highest levels across the three groups. Interestingly, citizen participation in urban areas records a mean of 2.80 (SD = 1.01), only marginally higher than rural participation and slightly lower than that observed in transition areas. This finding suggests a paradox in which greater access to digital services and higher levels of trust do not necessarily translate into higher participation. Earlier studies have observed similar dynamics in urban contexts, where structural inequalities, political disillusionment, or the perception of limited individual influence may weaken the impact of digital governance initiatives on active engagement (Kim and Lee, 2012; Tolbert and Mossberger, 2006). Moreover, the relative abundance of digital services in urban areas may normalize government responsiveness, reducing the perceived need for active civic participation (Peixoto and Fox, 2016; Shen et al., 2024).

Comparatively, the descriptive results indicate that digital transformation and trust in government increase progressively from rural to urban settings, reflecting broader developmental disparities. Participation, however, does not follow the same linear trend, instead peaking in transition areas. This highlights the complex nature of civic engagement, which is influenced not only by technological access and trust but also by contextual and structural conditions such as community networks, socioeconomic diversity, and the perceived efficacy of political action (Christensen and Lægreid, 2020). The relatively higher participation in transition areas may suggest that citizens situated between rural and urban spheres are more motivated to engage, possibly due to their unique position in negotiating both traditional and modern governance practices.

This pattern reflects what Peixoto and Fox (2016) termed the "participation paradox," where satisfaction and trust do not automatically lead to active engagement. The high perception of accessibility and fairness suggests progress in procedural trust (Christensen and Lægreid, 2020), but the limited digital literacy outreach (M = 3.13) constrains inclusivity—echoing Bertot et al.'s (2012) warning that technological access alone cannot ensure social equity. Furthermore, the higher digital transformation scores in urban and transitional areas support Onitsuka et al. (2018), showing how uneven infrastructural diffusion shapes governance participation patterns.

4.3 Regression analysis

Table 4 and Figure 3 report two OLS models that test (1) the direct effect of perceived digital transformation on trust in government, and (2) the effect of both digital transformation and trust in government on citizen participation. The results reveal three central findings that have coherent antecedents in contemporary scholarship on digital government.

First, perceived digital transformation is a strong, positive, and highly significant predictor of trust in government ($\beta = 0.571$, $p < 0.001$), and it likewise has a strong direct effect on participation ($\beta = 0.581$, $p < 0.001$). These coefficients indicate that respondents who perceive government digital services as more accessible, usable, and efficient report higher institutional trust and greater willingness to engage online. This pattern is consistent with research showing that well-implemented e-government and broader digital transformation initiatives strengthen process-basfed trust by improving responsiveness, service quality, and

perceived administrative competence. In particular, the empirical literature emphasizes that improvements in service usability, transparency, and transactional reliability are core channels through which digital transformation increases citizens' trust and their propensity to use online services (Mergel et al., 2019; Tolbert and Mossberger, 2006).

Second, trust in government itself is a very strong predictor of participation ($\beta = 0.695$, $p < 0.001$). This result supports theoretical accounts that treat trust as a necessary precondition for citizens to convert access to digital channels into meaningful civic action: when citizens trust institutions, they are more willing to submit complaints, contribute feedback, participate in consultations, and invest effort in digital engagement because they expect their input to be heard and to produce outcomes. Several studies of e-participation and e-government find comparable mediation or sequential relationships in which digital services raise trust and trust in turn increases participatory behaviors (Porumbescu, 2016; Tolbert and Mossberger, 2006).

Third, sociodemographic controls reveal important heterogeneity. Residence in rural areas is negatively associated with trust ($\beta = -0.233$, $p < 0.05$), while the rural effect on participation is not significant. This divergence suggests that spatial inequalities—rooted in unequal infrastructure, service reliability, and localized administrative capacity—undermine trust even where citizens may nominally have access to digital interfaces. The broader digital-divide literature stresses that access alone does not eliminate disparities: rural residents frequently face lower quality connections, less reliable service performance, and weaker local support structures, all of which depress institutional confidence (Latupeirissa et al., 2024; van Dijk, 2019).

The age and education covariates display contrasting associations across outcomes. Age has a small positive association with trust (marginally significant at conventional thresholds: $\beta = 0.006$, p ≈ 0.075) but a statistically significant negative effect on participation ($\beta = -0.015$, $p < 0.01$). In other words, older respondents in this case tend to report slightly higher trust in government but are less likely to engage in digital participation—an outcome that matches prior work showing that age may increase generalized institutional confidence while reducing proclivity for online civic activity because of differences in digital habits and ease of use. Education, by contrast, does not significantly predict trust in Model 1 but has a small positive and significant effect on participation in Model 2 ($\beta = 0.0134$, $p < 0.01$), consistent with the literature that regards education as a key enabler of second-level digital skills and of translating online access into participatory behaviors (Onitsuka et al., 2018; Taipale, 2013; Zhang, 2022).

Other predictors in the models—gender, income, and routine internet use—do not show significant direct effects on either trust or participation. Recent studies find that raw usage frequency can have ambiguous associations with political attitudes and trust because of the informational environment, the quality of attention, and the types of online activities (transactional vs. political vs. entertainment) condition whether internet exposure yields positive or negative civic

TABLE 4 The relationship between digital transformation, trust in government, and participation.

Variables	Trust in government		Participation	
	Coeff.	*p*-value	Coeff.	*p*-value
Digital transformation	0.571***	0.001	0.581***	0.001
Trust in government	–	–	0.695***	0.001
Rural (urban as reference)	−0.233**	0.042	0.110	0.528
Transition (urban as reference)	−0.026	0.774	0.099	0.472
Gender	−0.125	0.130	0.077	0.541
Age	0.006*	0.075	−0.015***	0.008
Education	−0.020	0.303	0.0134***	0.001
Income	0.001	0.111	0.001	0.658
Internet use	−0.041	0.342	0.019	0.764
Constant	1.963***	0.001	1.401**	0.027
F-statistic	15.38 (8,185)		11.52 (8,185)	
p-value	0.001		0.001	
R^2	0.373		0.303	

***, **, and * indicate $p < 0.01$, 0.05, and 0.10, respectively.
OLS, ordinary least squares. $n = 394$. Source: survey data.

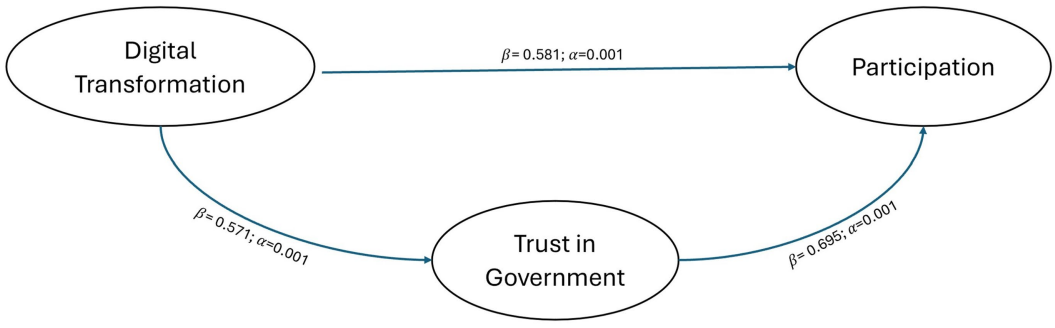

FIGURE 3
The relationship between digital transformation, trust in government, and participation based on coefficients and *p*-value.

outcomes. For instance, some large-scale analyses show that higher internet exposure can even depress trust under conditions of pervasive misinformation or when online information amplifies perceived social risk. This helps explain why your models point to perceived service quality (digital transformation) and institutional trust as stronger and more robust predictors of participation than raw internet usage metrics.

Digital transformation enhances trust, and trust in turn amplifies participation, while digital transformation also exerts a direct effect on participation. Practically, this implies a two-track logic for policymakers: (a) invest in service usability, reliability, and transparent processes to strengthen trust, and (b) complement these investments with inclusive outreach and skill-building (especially targeted at rural areas and older cohorts) to convert trust and access into sustained participatory engagement. The R^2 values (0.373 for trust; 0.303 for participation) indicate that the models explain a substantial share of variance but that other institutional, cultural, and contextual variables would further improve explanatory power in future work (for example, measures of perceived responsiveness, service completion rates, or prior experience with administrative outcomes). The evidence indicates that technical deployment (platforms and interfaces) must be coupled with governance reforms—clear SLAs for complaint handling, mobile-first design, community-based digital assistance, and transparency mechanisms—to ensure that digital transformation translates into both trust and active civic participation. Special attention to rural service quality and to educational outreach will be required if participation is an explicit policy objective rather than just service digitization.

These results strengthen Porumbescu's (2016) model that positions trust as a psychological bridge linking administrative experience with participatory intent. The findings further support the theoretical argument that digital transformation contributes to both procedural trust (through improved efficiency and transparency) and substantive trust (through fairness and responsiveness) (Christensen and Lægreid, 2020). However, in line with Peixoto and Fox (2016), trust alone may be insufficient; participatory mechanisms must visibly translate citizen input into decision-making outcomes. In the Indonesian context, the negative association between rural residence and trust ($\beta = -0.233$, $p < 0.05$) highlights persistent infrastructural inequality (van Dijk, 2019), while the age-related differences—positive for trust, negative for participation—mirror Taipale's (2013) observation of generational variation in e-participation. These nuances underline that the local dynamics of digital governance resonate with, yet also extend, global discussions on digital inclusion and civic engagement.

5 Conclusion and implications

This study demonstrates that digital transformation in Gowa Regency has significantly enhanced citizens' perceptions of service quality and institutional trust. Well-designed, transparent, and responsive digital platforms strengthen trust in government, which subsequently encourages higher levels of citizen participation. Nonetheless, the persistence of limited participation underscores that technological advancement alone is insufficient to generate meaningful civic engagement.

Theoretically, this research extends the literature on digital governance and institutional trust by empirically validating the mediating role of trust between digital transformation and citizen participation within a local government context. It advances the understanding that social and institutional environments—rather than technology per se—are decisive in shaping participatory outcomes in developing democracies. Practically, the findings suggest that effective digital transformation requires a dual commitment: improving digital infrastructure and ensuring inclusive, responsive, and trust-building governance practices. Policymakers must view digital initiatives not merely as administrative tools but as platforms for sustained democratic interaction.

Limitations of this study include its single-case focus and cross-sectional design, which may limit generalizability. Future research could employ comparative or longitudinal approaches to explore how trust and participation evolve across varying institutional and cultural contexts. Ultimately, this study provides insights of international relevance by illustrating how local digital governance practices in Indonesia reflect broader global challenges in building citizen trust and inclusive participation within the digital state.

Data availability statement

All data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics statement

The studies involving humans were approved by Prof. Dr. Veni Hadju, M.Sc, Ph.D—Faculty of Public Health, Hasanuddin University as Chair Dr. Wahiduddin, SKM, M.Kes—Faculty of Public Health, Hasanuddin University as Secretary. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

Nurlinah: Conceptualization, Formal analysis, Project administration, Supervision, Writing – review & editing. MA: Conceptualization, Formal analysis, Funding acquisition, Project administration, Resources, Validation, Writing – original draft. KC: Formal analysis, Methodology, Resources, Software, Validation, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

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