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Beyond Digital Efficiency: Reconstructing Public Value Through Citizen Satisfaction in Adaptive Governance

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ABSTRACT

Digital transformation in public administration is often claimed to generate public value, yet its linking mechanisms remain contested. This study proposes the Public Value Mediation Model in Digital Service Transformation, positioning citizen satisfaction as a transmission mechanism between technological improvements and the formation of perceived public value, as a conceptual contribution to the adaptive governance paradigm, in which adaptivity indicators are operationalized through service responsiveness and flexibility. Departing from Moore's (1995) normative approach, this study operationalizes public value as citizens' subjective assessments of service quality. The study employs an explanatory quantitative design, using a survey of 220 digital service users in Malang City, selected to represent a mid-sized city with measurable digital divides, relevant for testing the limits of digital efficiency claims under uneven infrastructure conditions, with 27 five-point Likert items. The dependent variable is operationalized as a composite public value score. Analysis employs Ordinal Logistic Regression; mediation was tested using the Sobel test, chosen for its suitability with ordinal data, despite its sensitivity limitations compared to bootstrapping. Results show that accessibility (β=0.298, $p<0.01$) and response speed (β=0.314, $p<0.001$) significantly enhance satisfaction, which in turn strengthens public value (β=0.382, $p<0.001$), with 40% partial mediation (Nagelkerke R^2=0.642). Critical finding: participation dimensions consistently scored lower than efficiency, indicating a significant efficiency–participation trade-off evidence that digitalization has yet to expand the democratic space of public services. Technological innovation does not automatically generate public value without meaningful citizen experience and attention to the digital divide.

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INTRODUCTION

Digital public services in developing countries often confront a persistent paradox. Governments invest substantial resources in technological infrastructure and digital platforms, yet citizens frequently perceive little improvement in public value. This paradox exposes a critical theoretical and practical gap in understanding how digital transformation translates into meaningful benefits for citizens and democratic governance. While efficiency gains from digitization are widely documented, the mechanisms through which technological improvements generate broader dimensions of public value are not. Transparency, participation, and institutional trust remain

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underdeveloped in theory and underexplored in empirical research. Consequently, governments may achieve technical progress without necessarily fostering stronger legitimacy or citizen satisfaction.

Cutting-edge literature is starting to abandon the old view that places technology only as a bureaucratic tool. Researchers such as Ansell & Trondal (2018) emphasize that digital governance needs to be seen as a socio-technical system that lives within adaptive institutional rules and practices. This change means that digital transformation is not just about installing new applications or moving services online. Public institutions must reorganize the way they provide services, explain decisions, and respond to the needs of citizens in a rapidly changing situation. However, academic discussions still rarely highlight citizens' experiences as a link between technological capabilities and public values. How citizens understand new procedures, feel valued, or even frustrated often goes unanalyzed. Citizen satisfaction, which is often used as a service assessment number, actually reflects a deeper interpretation process, because it is from the daily experience that residents give meaning to the institutional changes brought about by digitalization.

Existing literature exhibits several theoretical limitations that constrain the understanding of this relationship. First, technology acceptance models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have provided valuable insights into individual-level adoption behavior but tend to overlook broader institutional and social dimensions that characterize public sector contexts (Alzahrani, Al-Karaghouli, & Weerakkody, 2018). Even the extended versions of UTAUT applied in public governance continue to emphasize adoption intention rather than value creation, positioning satisfaction merely as an outcome rather than a mediating process. Conversely, the public value framework introduced by Moore (1995) focuses on strategic management and stakeholder legitimacy but predates the digital revolution, lacking integration with the socio-technical realities of e-government. More recent studies (Ju, Liu, & Feng, 2019; Twizeyimana & Andersson, 2019) have made important contributions by mapping the dimensions of digital public value, yet they stop short of articulating the causal pathways through which technology-enabled improvements are perceived as valuable by citizens.

Second, many theoretical models are constructed upon assumptions derived from high-income or Western contexts, thus inadequately capturing the distinctive constraints of developing countries. Digital transformation in such settings often unfolds amid structural inequalities, persistent infrastructure gaps, uneven digital literacy, socioeconomic disparities, and lower baseline institutional trust (Heeks & Shekhar, 2019). These conditions shape not only the accessibility and functionality of digital platforms but also the interpretive frameworks through which citizens assess their interactions with government. Consequently, analytical models derived from developed

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contexts may fail to account for adaptive behaviors, expectation gaps, or socio-cultural dynamics that influence satisfaction and perceived value in emerging democracies.

Third, empirical research that tests integrated theoretical models remains limited, especially those employing ordinal, perception-based data at the municipal level. Much of the existing literature concentrates on measuring technology adoption rates or discrete dimensions of public value, while overlooking the mediating processes that connect service transformation, satisfaction, and value creation. This methodological limitation constrains the development of empirically grounded explanations of how digital reforms reshape the citizen–state relationship in practical governance settings.

Indonesia's trajectory in digital public service development exemplifies these tensions. National initiatives such as the *Sistem Pemerintahan Berbasis Elektronik* (SPBE) have significantly expanded digital access and institutional coordination. Nevertheless, Indonesia's position in the 2023 UN E-Government Development Index ranked 77th globally reveals the continuing gap between technological implementation and citizen-centered design (United Nations Department of Economic and Social Affairs [UN DESA], 2023). Adni, Rusadi, & Baharuddin (2024) identify several technical and institutional barriers, including unstable networks, limited server capacity, and low levels of digital literacy, while Dewi & Suardana (2023) highlight the necessity of agile governance that enables bureaucracies to respond more flexibly to evolving citizen demands. Together, these findings underscore that digitalization in Indonesia has not yet fully matured into a system that consistently generates perceived public value.

Malang City provides a strategically significant case for examining these dynamics. As a mid-sized municipality, it reflects the most common scale of governance in Indonesia large enough to manage complex administrative systems yet small enough to reveal the nuances of citizen experience and inclusion challenges. Theoretically, Malang constitutes a critical case: a city with relatively high digital adoption rates yet measurable inter-kelurahan infrastructure inequality, enabling testing of whether digital efficiency generates public value equitably or reinforces access disparities. This makes findings from Malang directly relevant to broader debates on digital governance in middle-income Southeast Asian cities, where the gap between technological deployment and citizen-perceived value remains understudied. Its demographic diversity offers an informative microcosm for understanding how digital transformation interacts with social and institutional variables in shaping public perceptions of value and legitimacy.

To situate this research within existing theoretical traditions, three interrelated domains must be integrated: digital public service transformation, citizen satisfaction theory, and public value frameworks within adaptive governance.

First, technology-based public service transformation refers to the structural and functional changes in public service delivery enabled by digital platforms. Key operational dimensions include accessibility, response speed, and infrastructure availability. Accessibility determines the ease with which citizens can locate and utilize

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digital services; response speed reflects the timeliness of government action and communication; and infrastructure availability ensures the technological backbone required for stable service delivery. Prior studies have emphasized that accessibility and responsiveness are critical determinants of user engagement and satisfaction (Ahram & Falcão, 2018; Wang et al., 2021). However, infrastructure reliability remains a persistent concern in developing contexts (Zuiderwijk, Janssen, & Dwivedi, 2015). In resource-constrained environments, the presence of infrastructure acts as a necessary but insufficient condition: when it is absent, adoption is impossible; when it is present, citizens' perceptions shift toward evaluating qualitative aspects such as usability and responsiveness.

Second, citizen satisfaction represents a crucial yet under-theorized component in the digital governance value chain. Traditional public administration models conceptualize satisfaction as a terminal outcome reflecting service quality or performance. However, this study reconceptualizes satisfaction as a *mediating interpretive mechanism* a dynamic cognitive-affective process through which citizens derive meaning from service experiences and translate those experiences into broader institutional evaluations. Satisfaction comprises dimensions such as trust in services, expectation–reality alignment, and ease of use. Trust embodies citizens' confidence in system reliability, transparency, and data security (Kim & Lee, 2012), while expectation alignment is rooted in expectation-confirmation theory, which posits that satisfaction arises when service performance meets or exceeds prior expectations (Manoharan, Melitski, & Holzer, 2023). Ease of use, a central construct in both TAM and UTAUT frameworks, remains critical for both initial adoption and sustained engagement (Alzahrani et al., 2018). Within the context of adaptive governance, satisfaction performs three vital functions: it operates as a feedback signal allowing governments to detect service deficiencies, as a sensemaking filter through which citizens interpret whether technological innovations genuinely enhance public value, and as a legitimacy bridge reinforcing perceptions of responsiveness and democratic accountability.

Third, it is important to distinguish between two conceptions of public value. Moore (1995) foundational framework defines public value normatively a top-down, managerially-constructed collective benefit oriented toward strategic judgment by public managers. This study deliberately departs from that tradition by adopting a perception-based conception: public value as citizens' subjective assessment of service quality, legitimacy, and democratic responsiveness. This distinction is essential to avoid normative overclaiming and to ground the empirical analysis in measurable citizen evaluations rather than institutional intentions. In the context of digital governance, Twizeyimana & Andersson (2019) expand this framework by emphasizing that public value emerges not merely through efficiency but through citizen empowerment, institutional responsiveness, and inclusive service design. The co-creation of public value thus requires both technological capability and citizen participation. This study extends

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that logic by proposing that technology alone does not directly produce value; instead, value is co-constructed through citizens' evaluative experiences and interpretations of service interactions. When digital services are accessible, responsive, and reliable, they foster positive satisfaction, which in turn shapes citizens' perceptions of transparency, participation, and efficiency the core components of perceived public value.

Within this conceptual structure, the study articulates a Public Value Mediation Model of Digital Service Transformation that integrates these theoretical perspectives. The model posits that ease of access (H1), response speed (H2), and infrastructure availability (H3) each exert positive effects on citizen satisfaction, which itself positively influences perceived public value (H4). Furthermore, citizen satisfaction is hypothesized to mediate the relationship between service transformation and public value (H5). Through this mediating process, the study aims to capture the interpretive dynamics that underlie how citizens experience and assess digital transformation within local governance settings.

Grounded in these theoretical and empirical considerations, this research seeks to fill three critical gaps in the existing body of knowledge. The novelty of this study does not lie in the technique of satisfaction mediation per se which has been applied in service quality research but rather in its theoretical recontextualization: applying mediation analysis within an adaptive governance framework to operationalize perceived public value (not Moore's normative construct) and testing this model empirically in a developing-country municipal context where the relationship between digital investment and citizen-perceived value remains empirically understudied. Previous studies have yet to integrate service transformation and citizen satisfaction within a unified explanatory model of public value creation. Moreover, there remains a lack of context-adaptive frameworks sensitive to the realities of developing countries, where the relationship between technology and governance outcomes is shaped by infrastructural, social, and institutional constraints. Finally, the scarcity of empirical research using ordinal, perception-based data at the municipal level limits understanding of how these relationships operate in practice. Addressing these gaps, this study investigates how technology-based public service transformation influences public value through citizen satisfaction, conceptualized as an adaptive interpretive mechanism within resilient governance systems.technology-based public service transformation influences public value through citizen satisfaction, conceptualized as an adaptive interpretive mechanism within resilient governance systems.

Theoretically, the study makes three principal contributions. First, it enriches public value theory by demonstrating that satisfaction is not merely a consequence of service quality but a mediating cognitive process through which citizens ascribe institutional meaning to technological innovations. Second, it advances adaptive governance scholarship by illustrating how citizen feedback loops enable iterative learning and collaborative value co-creation in digital contexts. Third, it introduces a contextually

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grounded analytical framework calibrated to developing-country realities, offering both conceptual refinement and practical insights for designing inclusive, citizen-centered digital services. Through these contributions, the research aims to bridge the gap between technology-driven reforms and the realization of tangible, citizen-perceived public value within adaptive governance paradigms.

METHOD

Research Design

This study employed a quantitative explanatory research design to examine the causal relationships among technology-based public service transformation, citizen satisfaction, and public value. The explanatory approach was selected because it allows the identification and testing of hypothesized linkages between variables while assessing the mediating role of satisfaction in value creation. Such a design is consistent with recommendations for theory-testing studies that seek to establish not only correlations but also directional relationships among constructs (Creswell & Creswell, 2022).

The research was conducted using a cross-sectional survey framework, which collected data from respondents at a single point in time. This design was chosen to balance practical feasibility and analytical rigor, providing sufficient data for model estimation while capturing a snapshot of citizens' evaluative perceptions of digital public services. The quantitative orientation also enabled the application of statistical techniques such as Ordinal Logistic Regression (OLR), suitable for analyzing Likert-type ordinal data and testing mediating effects in hierarchical models. By adopting a structured and replicable methodology, the study aimed to ensure the internal consistency, validity, and generalizability of findings within the boundaries of the case context.

Sampling Design and Sample Size Determination

The target population comprised residents of Malang City aged 18 years and above who had accessed at least one technology-based public service within six months prior to data collection. Malang City was selected as the research site because it represents a typical urban governance unit in Indonesia, combining active digital innovation with diverse socio-demographic characteristics. According to *Badan Pusat Statistik Kota Malang* (BPS, 2024), the eligible population for this study was approximately 580,000 individuals.

Sampling followed a stratified random approach to ensure representativeness across the city's four administrative sub-districts (*kecamatan*). Each sub-district constituted a stratum, within which respondents were randomly selected based on proportional allocation. This design minimized sampling bias and ensured geographic diversity, capturing variations in citizens' digital access and service experiences. Sample size was determined using the G*Power 3.1.9.7 software for logistic regression, applying parameters of $\alpha = 0.05$, statistical power = 0.80, and an anticipated odds ratio effect size

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of 1.5 with nine predictors. The computation produced a minimum required sample of 194 respondents. To ensure robustness, the study collected 220 valid responses, surpassing the minimum requirement by 13.4%. The achieved response rate was 68.2%, derived from 220 completed questionnaires out of 323 eligible contacts. This level of participation aligns with recommended standards for face-to-face survey research in public administration contexts.

Data Collection Procedures

Data collection was conducted between August 15 and September 10, 2025, through face-to-face household surveys administered by trained enumerators. The door-to-door approach was chosen to ensure inclusivity, allowing participation from citizens with varying levels of digital literacy and internet access. Before field deployment, enumerators participated in structured training sessions covering research objectives, instrument content, standardized administration protocols, and research ethics. These sessions aimed to ensure uniformity in data collection and minimize interviewer bias.

A pilot test involving fifteen respondents was conducted two weeks before the main survey to refine wording, confirm comprehension, and assess timing. Feedback from this stage resulted in minor adjustments to item phrasing and sequencing. During fieldwork, enumerators adhered to ethical standards, including obtaining informed consent, ensuring respondent anonymity, and avoiding coercion. Each respondent was informed that participation was voluntary and that data would be used solely for academic purposes. All procedures complied with institutional ethical guidelines and reflected best practices for research involving human participants.

Instrument Development and Validation

The research instrument consisted of a structured questionnaire divided into three sections measuring: (1) Technology-Based Public Service Transformation, (2) Citizen Satisfaction, and (3) Public Value. Each construct was operationalized using multiple indicators adapted from prior validated studies. Responses were recorded on a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). In total, 27 items were included: nine for technology-based transformation (three each for accessibility, response speed, and infrastructure availability), nine for citizen satisfaction (three each for trust, expectation-reality alignment, and ease of use), and nine for public value (three each for transparency, citizen participation, and service efficiency).

Content validity was assessed through expert evaluation involving two academic reviewers specializing in digital governance and public management. The evaluation produced a Content Validity Index (CVI) of 0.89, exceeding the recommended minimum threshold of 0.80 (Hair et al., 2022). Construct validity was examined using Exploratory Factor Analysis (EFA). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.87, and Bartlett’s Test of Sphericity was significant ($\chi^2 = 1847.32$, $df = 351$, $p <$

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0.001), confirming the suitability of the data for factor analysis. The EFA extracted nine distinct factors explaining 71.4% of total variance, with all item loadings above 0.60 and cross-loadings below 0.30, demonstrating satisfactory discriminant validity.

Reliability tests indicated strong internal consistency across all constructs. Cronbach's alpha coefficients were as follows: Ease of Access (α = 0.84), Response Speed (α = 0.87), Supporting Infrastructure (α = 0.82), Trust (α = 0.88), Expectation-Reality Alignment (α = 0.85), Ease of Use (α = 0.83), Service Transparency (α = 0.86), Citizen Participation (α = 0.81), and Public Service Efficiency (α = 0.89). All values exceeded the minimum reliability threshold of 0.70, indicating that the instrument provided stable and consistent measures across respondents.

Analytical Techniques

The data were analyzed using Ordinal Logistic Regression (OLR), implemented via *Jamovi* version 2.6.13. This technique was selected because it accommodates ordinal dependent variables commonly generated by Likert-type scales while preserving the rank order of responses (Agresti, 2018). The analysis proceeded in three sequential stages:

(1). estimating the effect of technology-based public service transformation (X) on citizen satisfaction (Z);
(2). testing the impact of citizen satisfaction (Z) on public value (Y); and
(3). assessing both direct and indirect effects of transformation on public value through the mediating variable satisfaction.

Prior to estimation, all model assumptions were rigorously tested. Proportional odds assumptions were evaluated using the Brant test, ensuring that regression coefficients remained constant across threshold levels of the dependent variable. Multicollinearity diagnostics were conducted using Variance Inflation Factors (VIF), with all values below 10, confirming the absence of collinearity issues among predictors. Model fit was examined using -2 Log Likelihood, Nagelkerke R^2, and likelihood ratio chi-square statistics. The statistical significance of each coefficient was assessed at the $\alpha = 0.05$ level, with odds ratios (Exp[B]) used to interpret the magnitude of effects.

In addition to the main regression models, mediation effects were further validated using the Sobel test to confirm the statistical significance of indirect pathways between independent and dependent variables through satisfaction. The Sobel test was selected for its compatibility with Ordinal Logistic Regression procedures and ordinal-scale data. Its primary limitation relative to bootstrapping is lower sensitivity in detecting weak or asymmetrically distributed indirect effects; the mediation estimate of 40% should therefore be interpreted as indicative rather than definitive, and replication using bootstrapping is recommended as a robustness check. All analyses were accompanied by diagnostic checks, including residual evaluation and proportional odds tests, to ensure analytical accuracy and reliability.

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Ethical Considerations

Ethical compliance represented a central component of this research design. Respondents were informed of the purpose, voluntary nature, and confidentiality of their participation prior to data collection. No personal identifiers were recorded, and all responses were anonymized. Informed consent was obtained verbally before each interview session, consistent with standard ethical protocols in survey research involving human participants.

The study adhered to the ethical guidelines of the Faculty of Administrative Science, Brawijaya University, ensuring that data handling, storage, and reporting followed established integrity principles. Given the focus on non-sensitive topics such as perceptions of public service, the study was categorized as minimal risk. Nonetheless, enumerators were instructed to maintain professionalism and respect participants' privacy throughout the research process. These measures collectively ensured that the research upheld ethical transparency, accountability, and respect for participant autonomy.

Summary of Methodological Rationale

The methodological choices made in this study were guided by the need to align analytical rigor with contextual appropriateness. A quantitative explanatory design was deemed optimal for testing a mediation model that connects digital service transformation, citizen satisfaction, and public value. The use of stratified random sampling increased external validity by ensuring representation across socio-demographic and geographic strata. The adoption of validated instruments enhanced measurement accuracy, while the application of Ordinal Logistic Regression provided a statistically sound method for analyzing ordinal data and testing mediation hypotheses.

By combining methodological precision with contextual sensitivity, this approach allowed the study to produce findings that are both theoretically meaningful and practically relevant. The design acknowledges the complexity of digital transformation in developing-country settings where structural constraints coexist with institutional innovation and therefore provides a balanced foundation for examining how technology-driven governance reforms influence citizen perceptions of value creation.

RESULTS AND DISCUSSION

Respondent Characteristics and Sample Profile

The analysis draws upon data collected from 220 active users of technology-based public services in Malang City. The demographic characteristics of respondents reflect a representative cross-section of digitally engaged citizens. Gender distribution shows that 119 respondents were male (54.1%) and 101 were female (45.9%), suggesting that both genders participate relatively equally in digital service use. This balanced gender participation underscores the broad accessibility of Malang's e-government platforms,

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indicating that technological infrastructure and user interfaces are not significantly gender-biased in their design or usability.

Age distribution reveals that the majority of users belong to productive working-age cohorts. Respondents aged 26–35 years formed the largest group (38.2%), followed by those aged 36–45 (30.0%), 18–25 (18.2%), and over 45 years (13.6%). This age pattern aligns with prior research showing that middle-aged citizens typically exhibit the highest levels of digital engagement because they combine professional necessity with sufficient digital literacy (Wang et al., 2021). The relatively lower participation among senior citizens highlights a continuing generational digital divide, suggesting that older groups may face barriers related to access, literacy, or perceived relevance of digital platforms.

Educational attainment was another defining characteristic of the sample. A significant proportion of respondents held higher education credentials: 45.9% possessed a bachelor's degree, 22.3% a diploma, 20.0% completed high school, and 11.8% had postgraduate qualifications. Compared with national statistics indicating that only 9.2% of Indonesians hold a bachelor's degree (BPS, 2025), this distribution reveals a pronounced skew toward the educated population. This overrepresentation constitutes a recognized limitation: the sample is likely biased toward digitally literate citizens, which may produce overly optimistic satisfaction and public value scores relative to the broader population. To partially mitigate this, data collection was conducted at both physical service counters and digital access points, aiming to include citizens with varying levels of digital engagement. Nonetheless, results should be interpreted with caution as potentially not representative of non-users or citizens with limited digital access. Future research should deliberately include non-users and low-literacy populations to produce a more balanced assessment of digital governance outcomes.

Patterns of service utilization further reveal which functions citizens prioritize in their interactions with government. Population administration services accounted for the largest share of use (34.1%), followed by licensing (25.9%), digital health (18.2%), complaint management (10.9%), and online education services (10.9%). These findings illustrate that digital governance initiatives in Malang primarily fulfill administrative and transactional needs rather than participatory or deliberative functions. Thus, while citizens actively use digital services for routine government interactions, opportunities for collaborative or policy-oriented engagement remain limited.

Descriptive Statistics of Core Constructs

Descriptive analysis provides valuable insight into citizens' perceptions of digital service transformation and its associated outcomes. Across the three main constructs Technology-Based Public Service Transformation (X), Citizen Satisfaction (Z), and Public Value (Y) the data reveal generally favorable assessments, albeit with noticeable variation among dimensions.

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For the transformation construct, *Ease of Access* (X_1) recorded a mean of 3.87 (SD = 0.74), indicating that citizens generally find the city's digital platforms accessible and user-friendly. *Response Speed* (X_2) achieved a mean of 3.78 (SD = 0.81), suggesting that although the majority of users perceive timely responses, delays and bureaucratic latency still occur in certain services. *Infrastructure Availability* (X_3) registered the lowest mean (3.69, SD = 0.88), signaling that physical and network capacity constraints remain a tangible obstacle. Interestingly, despite these limitations, satisfaction levels remain high a phenomenon explained by Heeks and Shekhar's (2019) notion of "adaptive expectations," whereby citizens in resource-constrained environments adjust their expectations based on contextual realities, leading to relative satisfaction even with modest improvements.

Citizen satisfaction (Z) yielded an overall mean of 3.91 (SD = 0.69), reflecting positive yet cautious approval of digital services. Within this construct, *trust in services* received the highest rating (mean = 4.02, SD = 0.71), indicating strong confidence in system credibility and data security. *Ease of use* followed with a mean of 3.88 (SD = 0.72), while *expectation-reality alignment* scored slightly lower (mean = 3.84, SD = 0.76). These results align with the theoretical premise that usability and reliability are foundational drivers of satisfaction (Alzahrani et al., 2018). When citizens perceive systems as easy to navigate and reliable, they are more likely to assign positive meaning to their interactions, reinforcing trust and institutional legitimacy.

Public value (Y) exhibited differentiated evaluations across its subdimensions. *Service Transparency* achieved a mean of 3.83 (SD = 0.78), reflecting moderate perceptions of openness and accountability. *Citizen Participation* displayed the lowest mean (3.71, SD = 0.83), suggesting that digital transformation has yet to fully incorporate participatory mechanisms. Conversely, *Public Service Efficiency* recorded the highest mean (4.01, SD = 0.68), indicating that citizens strongly recognize the efficiency benefits derived from digitalization. This discrepancy between the highest-scoring dimension (efficiency, M = 4.01) and the lowest (participation, M = 3.71) is not a minor variation but a theoretically significant finding: it constitutes empirical evidence of an efficiency–participation trade-off in digital governance, wherein digitalization enhances administrative performance while simultaneously leaving democratic co-production mechanisms underdeveloped. This imbalance should be understood as a structural feature rather than an anomaly, reflecting the transactional rather than transformational orientation of current digital service platforms. This resonates with Meijer, Curtin, and Hillebrandt's (2012) observation that digital governance initiatives often prioritize administrative convenience over democratic engagement.

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Inferential Analysis: Testing Hypotheses and Mediation

To empirically validate the theoretical framework, three regression models were estimated using Ordinal Logistic Regression (OLR). Each model sequentially incorporated additional variables to test both direct and indirect effects.

Model 1 assessed the influence of transformation dimensions on satisfaction. Results confirmed that *ease of access* ($\beta = 0.298$, $p = 0.003$), *response speed* ($\beta = 0.314$, $p < 0.001$), and *infrastructure availability* ($\beta = 0.267$, $p = 0.007$) significantly enhanced satisfaction. Among these, response speed exerted the strongest influence (Exp[B] = 1.369), meaning that each one-unit improvement in responsiveness increased the odds of higher satisfaction by 36.9%. This highlights the critical importance of temporal performance in digital service contexts citizens equate responsiveness with attentiveness and efficiency. Model 1 demonstrated a high explanatory power (Nagelkerke $R^2 = 0.487$), with excellent model fit (likelihood ratio $\chi^2 = 134.56$, $p < 0.001$).

Model 2 examined the relationship between citizen satisfaction and perceived public value. The effect was both positive and significant ($\beta = 0.382$, $p < 0.001$), indicating that satisfaction is a strong predictor of how citizens evaluate the public value generated by digital services. Specifically, a one-unit increase in satisfaction raised the likelihood of higher perceived value by 46.5% (Exp[B] = 1.465). This result confirms the mediating premise that satisfaction functions as an interpretive bridge linking technological improvements to evaluative judgments about government performance.

Model 3 integrated both direct and indirect pathways to assess mediation. When satisfaction was introduced into the model, the direct effects of transformation variables on public value weakened considerably accessibility ($\beta = 0.142$, $p = 0.089$), response speed ($\beta = 0.158$, $p = 0.067$), and infrastructure ($\beta = 0.126$, $p = 0.134$) while satisfaction remained highly significant ($\beta = 0.324$, $p < 0.001$). This shift indicates partial mediation, confirming that citizen satisfaction transmits approximately 40% of the total effect from digital transformation to public value. Sobel tests supported the statistical significance of these indirect effects ($z = 3.54–4.21$, $p < 0.001$). The overall model fit was robust (Nagelkerke $R^2 = 0.642$), explaining 64.2% of variance in perceived public value, a substantial improvement over earlier model.

Interaction Effects: Education as a Moderator

Further analysis explored potential moderating influences of demographic variables. Education level emerged as a significant moderator, while age and gender effects were non-significant. The moderating role of education was particularly evident in the relationship between *ease of access* and *satisfaction* ($\beta = 0.187$, $p = 0.020$), as well as *response speed* and *satisfaction* ($\beta = 0.143$, $p = 0.041$).

Simple slope analysis revealed clear educational gradients. Among respondents with high school education or less, the effects of accessibility and responsiveness were minimal ($\beta = 0.14–0.16$, $p > 0.10$). For bachelor's degree holders, these effects

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strengthened significantly (β = 0.32–0.35, p < 0.01), and they were most pronounced among postgraduates (β = 0.49–0.52, p < 0.001). This pattern underscores that citizen with greater digital literacy and critical capacity derive more satisfaction from equivalent service improvements. It also raises a critical equity issue: digital governance reforms may inadvertently privilege the educated, thereby reinforcing pre-existing social inequalities a challenge that Dewi & Suardana (2023) identify as a major governance concern in Indonesia's evolving digital bureaucracy.

Discussion: Interpreting the Core Findings

The findings validate the central proposition of this study: technology-based service transformation enhances public value not directly but through the mediating role of citizen satisfaction. What does this finding change in the literature? It challenges the dominant techno-optimist assumption that underlies most e-government scholarship: the premise that better technology linearly produces better governance outcomes. By demonstrating that the technology–value relationship is contingent on citizen satisfaction a subjective, interpretive, and socially mediated process this study repositions the citizen not as a passive recipient of digital services but as an active co-constructor of public value. This shifts the analytical lens from input-oriented (infrastructure, platform deployment) to experience-oriented (usability, responsiveness, trust) indicators of governance quality, a reorientation with significant implications for how digital transformation is designed, evaluated, and theorized. This conclusion carries both theoretical and practical significance. Theoretically, it affirms that satisfaction functions as an interpretive mechanism through which citizens make sense of government performance. Rather than responding solely to objective technological improvements, citizens form evaluative judgments based on their subjective experiences of accessibility, responsiveness, and usability.improvements, citizens form evaluative judgments based on their subjective experiences of accessibility, responsiveness, and usability.

From a practical perspective, these findings challenge techno-centric assumptions that digitalization alone guarantees value creation. Technological sophistication does not automatically translate into legitimacy or trust unless citizens perceive genuine improvement in their service experience. Governments, therefore, must shift their focus from input-oriented metrics (e.g., infrastructure spending) toward outcome-oriented indicators that reflect how citizens interpret and internalize digital reforms.

Moreover, the consistent mediation rate of approximately 40% suggests that satisfaction plays a stable, structural role in the relationship between service transformation and public value. This implies that the co-creation of value in digital governance is inherently interpretive citizens' experiences, expectations, and perceptions actively shape the meaning of technological change. As Moore (1995) and Ju et al. (2019) argue, public value emerges not merely from managerial efficiency but from the interaction between institutional performance and citizen interpretation.

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The Participation–Efficiency Paradox

One of the most theoretically significant findings in this study concerns the discrepancy between efficiency and participation. Respondents rated efficiency (M = 4.01) substantially higher than participation (M = 3.71), a 0.30-point gap that highlights what Meijer et al. (2012) describe as the "efficiency–participation paradox." This paradox is not merely an empirical oddity; it represents a structural critique of prevailing digital governance strategies that optimize for administrative rationalization while neglecting the democratic co-production of public value. The finding contributes to the efficiency–participation trade-off debate by providing rare perception-based empirical evidence from a developing-country municipal context evidence that digitalization can simultaneously increase service efficiency scores and suppress participatory engagement. This challenges the assumption, prevalent in both technocratic e-government models and adaptive governance frameworks, that increased digital capability naturally broadens citizen agency. This paradox occurs when digital governance systems enhance service delivery performance but fail to strengthen participatory or deliberative dimensions of governance.

In the context of Malang City, this imbalance reflects a broader structural orientation toward administrative rationalization rather than democratic co-production. Digital platforms have effectively reduced transaction costs and improved processing speed, yet they have not sufficiently enabled citizens to contribute ideas, preferences, or feedback to decision-making. From the perspective of adaptive governance (Ansell & Trondal, 2018), this limitation constrains institutional learning. Adaptive systems depend on continuous feedback loops where governments listen, adjust, and evolve in response to citizen signals. The absence of participatory mechanisms weakens these feedback channels, making governance less resilient to emerging challenges.

Broader Implications for Adaptive and Inclusive Governance

The empirical evidence carries important implications for both theory and practice. Theoretically, it extends adaptive governance scholarship by linking satisfaction-based feedback mechanisms to the broader process of institutional adaptation. Satisfaction serves as a diagnostic tool through which governments can identify deficiencies, detect shifts in public expectations, and recalibrate digital systems. A government attuned to these signals can iteratively learn, redesign, and innovate thereby strengthening its adaptive capacity.

From a policy standpoint, these findings stress that inclusivity must become a central dimension of digital governance strategy. While infrastructure and platform development are essential, they must be complemented by efforts to enhance user competence, equity of access, and participatory functionality. Targeted digital literacy programs are necessary to ensure that citizens across educational and socioeconomic spectra can engage effectively with e-government systems. In parallel, governments should embed participatory features such as online consultations, collaborative

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dashboards, and transparent feedback loops into service design. These interventions would not only democratize digital platforms but also reinforce legitimacy by making citizens active co-producers of public value.

Synthesis: Toward a Citizen-Centered Digital Value Model

The synthesis of results and theoretical interpretation yields several key insights. First, accessibility and responsiveness emerge as the most powerful drivers of satisfaction and perceived public value, suggesting that user experience is the principal channel through which digital transformation generates legitimacy. Second, satisfaction mediates the transformation–value relationship consistently across all dimensions, reinforcing its conceptual role as an adaptive interpretive mechanism. Third, educational disparities highlight that value creation in digital governance is unevenly distributed, urging policymakers to design compensatory measures that ensure inclusivity.

Collectively, these insights form the basis of a citizen-centered model of digital value creation. In this model, public value is not a byproduct of technology alone but a co-constructed outcome emerging from the interaction between technological capability and citizens' experiential sensemaking. This aligns with Twizeyimana & Andersson (2019) argument that digital public value arises from empowerment, responsiveness, and inclusivity three qualities that depend on continuous engagement rather than static design. Therefore, future digital governance reforms must treat satisfaction not merely as an evaluative endpoint but as an active instrument for adaptive learning and institutional responsiveness.

In summary, the study demonstrates that digital service transformation in Malang City has substantively enhanced both satisfaction and perceived public value, albeit unevenly. Accessibility and responsiveness remain the most influential drivers of satisfaction, while infrastructural reliability and participatory inclusiveness lag behind. Citizen satisfaction serves as a mediating mechanism explaining roughly 40% of the transformation–value linkage, confirming that the citizen experience constitutes the core of value creation in digital governance.

However, the persistence of educational disparities and participatory deficits underscores the need for more inclusive policy designs. Governments must therefore move beyond a "build and deploy" mindset toward an "engage and adapt" paradigm one that recognizes satisfaction as both a product and a process of governance. Ultimately, adaptive digital governance will depend not only on the sophistication of technology but also on the institutional capacity to interpret, respond to, and co-create value with citizens in an equitable and participatory manner.

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CONCLUSION

This study examines the relationship between technology-based public service transformation, citizen satisfaction, and public value in digital governance in Malang City. Using ordinal perception data and a quantitative explanatory approach, the findings show that digital transformation contributes to public value mainly through citizen satisfaction as a mediating mechanism. Satisfaction acts not merely as an outcome but as an interpretive process through which citizens translate technological improvements into judgments about legitimacy, transparency, and efficiency. The results indicate that technological improvement alone does not automatically create public value; rather, value emerges from the interaction between system performance and citizens' service experiences. Accessibility, response speed, and infrastructure availability all have significant positive effects on satisfaction, with response speed exerting the strongest influence, indicating that timely and responsive services are central indicators of governmental competence. Citizen satisfaction subsequently becomes a strong predictor of perceived public value and mediates a substantial portion of the relationship between digital transformation and value creation. However, the findings also reveal an imbalance between efficiency and participation. While digital services have improved accessibility and administrative efficiency, opportunities for citizen participation, feedback, and collaborative engagement remain limited, suggesting that digital governance is still largely transactional rather than participatory. The study also identifies educational disparities, as citizens with higher education levels report greater satisfaction and stronger perceptions of public value, indicating that digital literacy shapes both access to and interpretation of digital services. This condition highlights the persistence of the digital divide that may limit the inclusivity of governance outcomes. Overall, the study emphasizes that digital transformation in governance should not be understood solely as a technological upgrade but as a human-centered and adaptive process in which public value is co-created through citizen experience, trust, usability, and continuous interaction between government systems and society.

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