

Optimizing E-Government for Enhanced Transparency and Accountability in Local Governance

Optimizing E-Government for Local Transparency

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ABSTRACT

Optimizing e-Government has become crucial for local governments to improve public service delivery, enhance transparency, and strengthen accountability in the digital era. This study aims to analyze the influence of e-Government optimization on improving transparency and accountability in local governments in Indonesia. The research is driven by the growing importance of digital bureaucracy systems in realizing open and responsible governance. A quantitative explanatory approach was employed, involving 150 respondents from five local governments that have implemented the electronic-based government for at least three years. The research instrument was developed using Electronic-Based Government System indicators and analyzed through Structural Equation Modeling e-CRM Partial Least Squares (SEM-PLS). The findings show that e-Government optimization has a positive and significant impact on both transparency (path coefficient = 0.67; $R^2 = 0.58$) and accountability (path coefficient = 0.72; $R^2 = 0.64$) at a 5% significance level. These results suggest that successful e-Government implementation encompassing technological infrastructure, system interoperability, managerial support, user competence, and digital service quality meaningfully contributes to information openness and public accountability. This study offers theoretical contributions to the literature on e-Governance and practical insights for local governments in designing effective, inclusive, and sustainable digital strategies.

Keywords: Accountability, Digital Governance, e-Government, Transparency, Public Service Delivery.

ABSTRAK

Mengoptimalkan e-Government menjadi krusial bagi pemerintah daerah untuk meningkatkan penyelenggaraan pelayanan publik, meningkatkan transparansi, dan memperkuat akuntabilitas di era digital. Penelitian ini bertujuan untuk menganalisis pengaruh optimalisasi e-Government terhadap peningkatan transparansi dan akuntabilitas pemerintahan daerah di Indonesia. Latar belakang penelitian ini didasari oleh pentingnya digitalisasi sistem birokrasi dalam rangka mewujudkan tata kelola pemerintahan yang terbuka dan bertanggung jawab. Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksplanatori. Data dikumpulkan melalui survei terhadap 150 responden dari lima wilayah pemerintah daerah yang telah menerapkan sistem pemerintahan berbasis elektronik minimal selama tiga tahun terakhir. Instrumen penelitian dikembangkan berdasarkan indikator sistem pemerintahan berbasis elektronik dan dianalisis

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menggunakan metode *Structural Equation Modeling e-CRM Partial Least Squares (SEM-PLS)*. Hasil penelitian menunjukkan bahwa optimalisasi e-Government berpengaruh positif dan signifikan terhadap transparansi (*path coefficient* = 0,67; $R^2 = 0,58$) serta akuntabilitas (*path coefficient* = 0,72; $R^2 = 0,64$) pada taraf signifikansi 5%. Temuan ini mengindikasikan bahwa keberhasilan implementasi e-Government yang meliputi infrastruktur teknologi, interoperabilitas sistem, dukungan manajerial, kompetensi pengguna, dan kualitas layanan digital berkontribusi secara nyata terhadap keterbukaan informasi dan pertanggungjawaban publik. Penelitian ini memberikan kontribusi teoretis dalam pengembangan literatur e-Governance dan kontribusi praktis bagi pemerintah daerah dalam merancang strategi digital yang efektif, inklusif, dan berkelanjutan.

Kata kunci: Akuntabilitas, Tata Kelola Digital, e-Pemerintahan, Transparansi, Penyediaan Layanan Publik.

INTRODUCTION

The integration of Information and Communication Technology (ICT) has become a fundamental component of modern governance, with e-Government at the forefront of this digital transformation. E-Government, defined as the use of digital technology to enhance public services, transparency, and accountability, is a cornerstone of bureaucratic reform in the digital era (Shenkoya, 2023; Latupeirissa, 2024; Sharmin & Chowdhury, 2025). The systematic adoption of e-Government aligns with the demands of bureaucratic reform in the digital era (Prasodjo, 2025). In Indonesia, the government's commitment to this transformation is evident in national regulations such as Presidential Instruction No. 3 of 2003 and Presidential Regulation Number 95 of 2018 on the electronic-based government system, which aim to create a more open, effective, and accountable bureaucracy. The importance of e-Government is particularly pronounced at the local level, where decentralized governance necessitates efficient service delivery and greater accountability (Pina et al., 2010). Optimizing these systems is therefore crucial for aligning with the principles of good governance, which prioritize transparency, citizen participation, and effectiveness.

Despite the clear policy directives and recognized benefits, the implementation of e-Government in Indonesia faces significant challenges. The national average electronic-based government system index, reported at just 2.3 out of 5.0 in 2023. This suboptimality is driven by a number of factors, including inadequate digital infrastructure, limited human resources, and a lack of strong institutional commitment. There are also notable disparities between regions, with areas that have limited fiscal capacity and human resources often lagging in digital development (Sofyani et al., 2020; Stofkova et al., 2022). Further complicating the issue are fragmented systems, weak leadership, and low digital literacy among civil servants, leading to underutilized, unsustainable, and often-redundant applications that fail to meet actual community needs (Bilan et al., 2023). This fragmented landscape underscores a significant gap in the comprehensive and systematic analysis of the factors influencing e-Government optimization and its simultaneous impact on transparency and accountability (Mayasari & Kushendar, 2023; Omweri, 2024; Sarifudin & Damanik, 2024).

Previous academic research has explored aspects of this relationship, but much of it remains descriptive and fragmented. Sugiartini and Tamamiyah (2024) noted that while e-Government positively contributes to public services and accountability, its impact is often limited by a lack of human resources and technological infrastructure. Schildt et al. (2017) highlighted how new technologies like big data and AI can boost transparency, but their effectiveness is contingent on organizational readiness and a supportive digital work culture. Putri et al. (2025) provided an example of successful integration in Tarakan City, where smart city policies enhanced public trust through data transparency. However, a significant gap remains in comprehensive studies that simultaneously analyze the drivers of e-Government optimization and its combined effects on both transparency and accountability within a local government context (Hochstetter et al., 2023; Aleisa, 2024).

This study addresses critical gaps in local e-Government research and responds to rising public demands for integrity and information openness. 45% of corruption cases occur at the regional level, often linked to low transparency in financial management. Although the government promotes digitalization through the Regional Digitalization Acceleration and Expansion Program, Ministry of Finance of the Republic of Indonesia (2024) shows that only 42% of local governments have documented digital strategies, indicating that e-Government optimization remains incomplete and requires evidence-based, context-specific interventions. The study contributes a novel perspective by combining recent literature (2020–2025), quantitative data from regional case studies, and an evaluative framework for electronic-based government system policy implementation. Its systematic approach assesses e-Government success across public service delivery, information transparency, and financial and administrative accountability, offering practical guidance for strengthening digital governance at the local level.

Theoretically, this study aims to enrich the discourse on good governance in the digital age and broaden the understanding of how information technology can serve as a transformative tool in local governance systems. Practically, the research findings are intended to serve as a valuable reference for policymakers and bureaucrats, guiding them in developing contextual, adaptive, and responsive e-Government optimization strategies. The primary goal of this article is to analyze in-depth the mechanisms of e-Government optimization and evaluate its impact on improving transparency and accountability in Indonesian local governments. It also aims to formulate policy recommendations that support effective and accountable digital transformation within local government systems.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

E-Government and Transparency

In Indonesia, regulations such as Presidential Regulation Number 95 of 2018 on the electronic-based government system aim to create a more open, effective, and accountable bureaucracy. E-Government has become a vital instrument for bureaucratic reform and modern governance globally, particularly at the local level in decentralized countries like Indonesia, where it seeks to enhance efficiency, service quality, transparency, and accountability (Shenkoya, 2023; Birdayanthi et al., 2025). Nevertheless, implementation often faces challenges such as digital divides, human resource limitations, and weak institutional commitment (Apriliyanti et al., 2021; Umbach & Tkalec, 2022). This study, therefore, examines how e-Government optimization influences transparency and accountability in local governance.

Transparency in local government refers to openness in providing public information, decision-making processes, and resource utilization, enabling public oversight (Grimmelikhuijsen & Welch, 2012). E-Government facilitates this by disseminating information more openly, accessibly, and in real time. Integrated digital systems allow the public to access budgets, financial reports, local regulations, and tender announcements online, overcoming bureaucratic and geographic barriers. Abdulkareem and Mohd-Ramli (2022) found that the maturity of e-Government systems correlates positively with public information openness, especially via official websites. Beyond information dissemination, e-Government enables two-way civic interaction through features like e-consultation, e-reporting, and online forums, expanding channels for oversight and participation. Iskandar (2025) highlights that such innovations in smart governance enhance public trust by promoting data transparency and more accurate online monitoring systems. By integrating these mechanisms, the study underscores the critical role of e-Government in supporting the principles of good governance and fostering accountable, transparent local administrations.

H1: e-Government optimization has a positive and significant effect on local government transparency.

E-Government and Accountability

Accountability refers to the local government’s obligation to account for its actions and use of public resources in a transparent manner through digital platforms (Lindquist & Huse, 2017; Saldanha et al., 2022). Research indicates that e-government optimization also significantly impacts accountability. The digitalization of bureaucracy supports systematic, documented, and traceable reporting (audit trail). Digital documentation and audits, e-government systems create a clear and auditable digital footprint. This makes corrupt and nepotistic practices more difficult and facilitates oversight by external bodies. Omar et al. (2024) found that the digitalization of performance and financial reports can increase compliance and reduce the risk of administrative violations. Similarly, Mosweu and Ngoepe (2021) affirmed that electronic reporting and archiving systems accelerate the audit process and facilitate the tracking of budgetary irregularities. Online Reporting and Oversight, E-government optimization enables more transparent and measurable monitoring of performance and budget realization. Mawansyah (2024) showed that the use of electronic oversight dashboards at the district level can detect deviations in village funds in real-time. Furthermore, e-procurement systems increase accountability for the procurement of goods and services because the entire process is recorded and open to the public and state auditors. Thus, e-government functions as a reporting and control system that can reduce deviations and enhance bureaucratic effectiveness.

H2: e-Government optimization has a positive and significant effect on local government accountability.

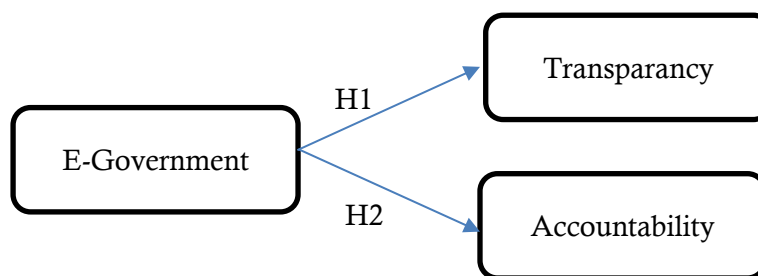


Figure 1. Conceptual Framework

Figure 1 illustrates how e-Government Optimization (X) positively and significantly influences two dependent variables: Transparency (Y1) and Accountability (Y2). E-Government Optimization is measured by five key dimensions: technological infrastructure, system interoperability, managerial support, user participation, and the quality of digital services. Meanwhile, Transparency is measured by public information disclosure, budget accessibility, and digital civic participation, while Accountability is measured by process documentation, digital reporting, and online supervision. This framework serves as the basis for the two primary hypotheses: H1, stating that e-government optimization positively affects transparency, and H2, stating that it has a positive effect on accountability.

RESEARCH METHODS

This study employs a quantitative approach with an explanatory research design to examine the influence of e-Government optimization on transparency and accountability in local Indonesian governments, following frameworks by Sugiyono (2019) and Ghazali (2021). A causal-comparative survey design was applied to collect data from 150 structural and functional officials directly involved in planning, public services, and IT across five cities and regencies: Bandung, Makassar, Semarang, Sleman, and Banyuwangi selected based on the diversity of their electronic-based government system index scores. Respondents were purposively sampled based on three criteria: affiliation with OPDs actively using digital services, at least two years’ experience with electronic-based

government system, and willingness to participate, ensuring data were obtained from individuals with strong technical and strategic understanding of e-Government implementation.

The study operationalizes three key variables. The independent variable, E-Government Optimization (Y), refers to the readiness and capacity of digital government systems to support public services, measured on a 1–5 Likert scale across five indicators: technological infrastructure, system interoperability, managerial support, user participation, and service quality (Heeks & Stanforth, 2007). The dependent variables are Transparency (X1), the degree to which local governments openly deliver public information online, measured via public information disclosure, budget accessibility, and digital civic participation and Accountability (X2) the local government's ability to account for actions and budgets through digital platforms, measured via documentation, digital reporting, and online evaluation and supervision (Barzelay, 2007; Al-Fattal, 2018; Dwiyanto, 2022).

Data were collected using a 5-point Likert scale questionnaire, adapted from Sugiartini and Tamamiyah (2024), Mozin et al. (2025), Putri et al. (2025), and Presidential Regulation Number 95 of 2018 on electronic-based government system. The questionnaire measured e-Government optimization across its five dimensions, and transparency and accountability across their respective indicators, structured in a clear, operationalized table.

Data analysis employed Structural Equation Modeling–Partial Least Squares (SEM-PLS) using SmartPLS version 4, appropriate for complex models with latent variables and moderate sample sizes. Analysis followed a two-stage process: first, the measurement model (outer model) was evaluated for validity and reliability through convergent validity ($AVE \geq 0.5$), discriminant validity (cross-loading and HTMT), and construct reliability (Composite Reliability and Cronbach's Alpha ≥ 0.7). Second, the structural model (inner model) assessed relationships between latent variables using path coefficients, R^2 for explanatory power, and bootstrapping for significance ($p < 0.05$). This rigorous approach ensures a robust and evidence-based understanding of how e-Government optimization affects transparency and accountability, providing a solid foundation for policy recommendations.

RESULTS

Descriptive Analysis of Respondent Characteristics. This study involved 150 civil servants from various local government organizations across five cities/regencies that have actively implemented the electronic-based government system. Respondent characteristics were analyzed based on five aspects: gender, age, education level, structural position, and length of electronic-based government system usage. The following is the descriptive analysis.

Based on the provided Table 1, here is a detailed narrative and explanation of the survey results regarding respondent characteristics. The total number of respondents for this study was 150 people. The majority of respondents were male, accounting for 91 people, or 60.7% of the total. Female respondents made up the remaining 59 people, or 39.3%. This shows that the sample group was predominantly male. The largest age group among the respondents was those aged 30-39 years, with 67 people, representing 44.7%. The next largest group was 40-49 years with 38 people (25.3%), followed by those under 30 years with 31 people (20.7%). The smallest age group was those over 50 years, with only 14 people, or 9.3%. This indicates that the respondents were mostly in their prime working age. The highest level of education for most respondents was S1 (Bachelor's degree), with 82 people, or 54.7%. This was followed by S2 (Master's degree), with 47 people (31.3%). D3 (Associate's degree) was the last education level for 15 people (10%), while only 6 people (4%) had an S3 (Doctoral degree). This suggests that the majority of the respondents are highly educated.

Table 1. Characteristic Respondents

Respondents	Characteristics	Frequency	Percentage
Gender	Male	91	60.7%
	Female	59	39.3%
	Total	150	100%
Age	<30 years	31	20.7%
	30-39	67	44.7%
	40-49	38	25.3%
	>50 years	14	9.3%
	Total	150	100%
Last Education	D3	15	10%
	S1 (Bachelor)	82	54.7%
	S2 (Master)	47	31.3%
	S3 (Doctoral)	6	4%
	Total	150	100%
Structural Position	Staff	73	48.7%
	Subdivision/Section	45	30%
	Division Head	22	14.7%
	Department Head	10	6.6%
	Total	150	100%
Duration of Electronic-Based Government System Usage	<1 year	11	7.3%
	1-3 years	73	48.7%
	>3 years	66	44%
	Total	150	100%

Regarding their structural position, the largest group of respondents were classified as Staff, at 73 people, or 48.7%. Subdivision/Section Heads made up the next largest group with 45 people (30%). Division Heads accounted for 22 people (14.7%), and the smallest group was Department Heads, with 10 people (6.6%). The majority of respondents had been using the electronic-based government system system for 1-3 years, with 73 people, or 48.7%. Those who had been using it for over 3 years came in a close second, with 66 people (44%). The smallest group was those who had used the system for less than 1 year, with only 11 people, or 7.3%. This implies that most of the respondents have substantial experience with the electronic-based government system system.

Table 2. Validity and Reliability Test

Variable	Composite Reliability	Cronbach's Alpha	AVE
E-Government Optimization (EGO)	0.889	0.853	0.612
Transparency (TRN)	0.873	0.821	0.587
Accountability (ACC)	0.901	0.868	0.635

Table 2 presents the results of the validity and reliability test for the research variables. All constructs show Composite Reliability values above 0.70 (ranging from 0.873 to 0.901), indicating strong internal consistency. Similarly, the Cronbach's Alpha values for all variables are also above the acceptable threshold of 0.70, confirming reliability. In terms of convergent validity, the Average Variance Extracted (AVE) values for E-Government Optimization (0.612), Transparency (0.587), and Accountability (0.635) are all above 0.50, which meets the minimum requirement. These results demonstrate that the measurement model is both valid and reliable, and the constructs are appropriate for further analysis.

SEM-PLS analysis in this study aimed to validate the conceptual model and test the empirical significance of the relationships among variables. This provided a basis for formulating evidence-based policy recommendations regarding the optimization of e-Government to enhance transparency and accountability in regional governments. The evaluation of the structural model (inner model) was conducted to determine how well the conceptual framework explained the relationships among latent constructs. In the Partial Least Squares Structural Equation Modeling (SEM-PLS) approach, this includes the R² coefficient, path coefficients, and significance testing via bootstrapping.

Table 3. Structural Model Evaluation (SEM-PLS)

Relationship	Path Coefficient	t-value	p-value	R ²
e-Gov Optimization → Transparency	0.67	12.37	0.000	0.58
e-Gov Optimization → Accountability	0.72	14.08	0.000	0.64

Based on the results of Table 3, the structural model estimation using the SEM-PLS technique, two main relationship paths were obtained between the latent variable e-Government Optimization (X) and two dependent variables, namely Transparency (Y1) and Accountability (Y2). The following is an interpretive description of each relationship. The structural model of this study was evaluated to determine the strength and significance of the relationships between the latent variables. The Coefficient of Determination (R²) indicates the model's explanatory power. The results show that the model is strong, with an R² of 0.58 for transparency and 0.64 for accountability. This means that e-Government optimization explains 58% of the variance in transparency and 64% of the variance in accountability, which is considered a strong and robust finding according to Hair et al. (2021). Furthermore, the path coefficients demonstrate a strong, positive, and statistically significant relationship. The path from e-Government optimization to transparency has a coefficient of 0.67 (t=12.37, p<0.001), while the path to accountability has an even stronger coefficient of 0.72 (t=14.08, p<0.001). Both relationships are highly significant, as evidenced by the t-values being well above the 1.96 threshold and p-values less than 0.001. These findings empirically confirm the hypotheses that e-Government optimization significantly improves both transparency and accountability in local government.

Path coefficients reveal the strength and direction of relationships between different constructs. In this study, the path from e-Government Optimization to Transparency has a coefficient of 0.67, with a high t-value of 12.37 and a p-value less than 0.001. Similarly, the path from e-Government Optimization to Accountability has an even stronger coefficient of 0.72, supported by a t-value of 14.08 and a p-value also less than 0.001. The bootstrapping results confirm that both of these paths are statistically significant, as their t-values are well above the threshold of 1.96 and their p-values are below 0.05. These findings provide strong support for hypotheses H1 and H2, demonstrating that the optimization of e-Government has a significant positive effect on improving both transparency and accountability within regional government. As a result, the structural model of this study is considered both predictively strong and statistically significant, providing a robust, empirical basis for developing effective digital governance policies.

DISCUSSION

The findings of this study provide substantial evidence that the optimization of e-Government has a positive and significant effect on both the transparency and accountability of local governments. Specifically, the analysis using the Structural Equation Modeling Partial Least Squares (SEM-PLS) method revealed a path coefficient of 0.67 for the effect of e-Government optimization on transparency, with an R² value of 0.58 and a p-value < 0.001. This indicates that approximately 58% of the variance in local government transparency can be attributed to successful digital government implementation, encompassing technological infrastructure, system interoperability, managerial support, user participation, and the quality of digital services. Similarly, the influence of e-Government optimization on accountability showed a path coefficient of 0.72, with an R² of 0.64 and a p-value < 0.001, meaning that 64% of variations in local government accountability can be explained by digitalization efforts, particularly in documentation, online reporting, and system-based oversight mechanisms.

These results strongly reinforce hypotheses H1 and H2 and provide a clear answer to the research problem: the more optimally digital systems are implemented within local bureaucracy, the higher the level of transparency and accountability. Theoretically, these findings align with the Grand Theory of Good Governance, particularly the principles of transparency and accountability. Transparency in Good Governance emphasizes

openness of information, public access to decision-making processes, and the right of citizens to obtain real-time information on policies, budgets, and governmental decisions. In this context, e-Government serves as a structured and systematic medium to actualize transparency, ensuring that public information is accessible, timely, and reliable. Empirically, Abdulkareem and Mohd Ramli (2022) demonstrated that the maturity of e-Government systems correlates positively with public information openness, particularly through official government websites. Similarly, Iskandar (2025) noted that digital features such as e-consultation, e-reporting, and online public forums facilitate active citizen engagement and broaden oversight channels. Gamayuni and Hendrawaty (2020) highlighted the importance of e-budgeting and e-planning platforms in providing access to planning documents and regional budget reports, while Omisola et al. (2023) emphasized that user-friendly interfaces, system interoperability, and real-time data presentation are essential for achieving meaningful transparency.

In terms of accountability, the findings indicate that e-Government functions as a critical instrument to ensure verifiable and auditable bureaucratic processes. Within the Good Governance framework, accountability requires clear documentation and oversight of all decisions and public resource utilization. Digital tools enable real-time tracking, reporting, and auditing, reducing the risk of administrative violations and enhancing compliance. Sipahutar and Tina (2024) found that digital reporting systems improve financial compliance and reduce administrative errors, while Mosweu and Ngoepe (2021) demonstrated that electronic reporting and archiving accelerate audit processes and facilitate the detection of budget irregularities. Mawansyah et al. (2024) reinforced this by showing that online monitoring dashboards at the district level can identify deviations in village funds in real-time, and Suriyani and Daryanto (2023) confirmed that e-procurement systems enhance accountability in goods and services procurement through transparency and traceable digital records.

From a theoretical standpoint, these findings also resonate with the New Public Management (NPM) perspective, which highlights information technology as a strategic tool for enhancing efficiency, effectiveness, and managerial control in public services. In this study, e-Government not only serves administrative functions but also embodies bureaucratic reform, improving process efficiency, fiscal transparency, and accountability. By integrating participatory digital platforms, local governments create opportunities for social control, horizontal oversight, and direct citizen engagement, thereby strengthening public trust and promoting a governance system that is responsible, measurable, and open to scrutiny.

In conclusion, this study demonstrates that optimizing e-Government significantly contributes to improving both transparency and accountability in local governments. By operationalizing digital systems effectively, governments can realize the principles of Good Governance in practice, facilitating open access to information, enhancing bureaucratic accountability, and ultimately strengthening the public's trust in governmental institutions. These findings provide both theoretical and practical evidence that digitalization is a pivotal mechanism for achieving modern, transparent, and accountable governance.

CONCLUSION

Based on the results of the data analysis and discussion that have been carried out, it can be concluded that the optimization of e-Government is proven to have a significant effect on increasing the transparency and accountability of local government. The coefficient of influence on transparency is 0.67 and on accountability is 0.72, showing a strong and positive relationship. This means that the more optimal the implementation of digital systems in local bureaucracy through the strengthening of infrastructure, integrated systems, institutional support, and user participation the higher the level of public information openness and bureaucratic accountability. With R^2 values of 0.58 and 0.64, respectively, it can be concluded that e-Government is one of the key factors in realizing the principles of good governance at the local level. These results support various previous

findings that emphasize the importance of digitalization as a strategy for increasing the legitimacy, efficiency, and integrity of local government.

This research highlights that e-Government contributes significantly to modern, transparent, and accountable governance, while enriching the literature on digital governance at the local level. Practically, comprehensive and integrated digital bureaucratic reforms enhance internal government performance, strengthen public legitimacy, increase trust, and facilitate social oversight. Local governments are therefore advised to expand civil servants' digital literacy, improve system interoperability between units, and ensure all data, public service processes, and financial reports are accessible and traceable online. To sustain effective electronic-based government system implementation, strengthening digital infrastructure and enhancing civil servants' technical competence are essential. At the national level, policymakers should provide incentives and technical support to underperforming regions to reduce digital inequality and ensure consistent accountability. Future research should examine mediating factors such as public trust or leadership quality to gain a deeper understanding of the determinants of e-Government success.

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