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Analysis of electronic government implementation in Tamalate District, Makassar City

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Abstract
This study examines the implementation of e-government principles and the conditions of e-government success factors in Tamalate District, Makassar City. A qualitative research methodology was employed, utilizing observation, interviews, literature review, and documentation for data collection. Both primary and secondary data were analyzed through data reduction, presentation, verification, and conclusion drawing processes. Results indicate that e-government principles enforcement and success factor achievement remain below ideal standards. Key principles, including transparency, accessibility, efficiency, effectiveness, and information security face significant obstacles. Transparency implementation remains incomplete, public accessibility is limited, system deployment is partial, and information security measures are inadequate. The critical success factors—human resources and ICT infrastructure—also present challenges. Employee capabilities in operating e-government systems are inconsistent, and preventive measures against ICT equipment damage are insufficient for maintaining reliable electronic government operations. This study concludes that e-government implementation in Tamalate District requires substantial improvement across all dimensions. Comprehensive reforms targeting these identified weaknesses, the district's electronic government system will continue operating below its potential effectiveness in serving public needs.

Keywords
Implementation, Electronic Government, Development, Tamalate District, Makassar City.

1 | INTRODUCTION

The development of globalization is a definite phenomenon, where every country in the world expects a more effective and efficient interaction than in previous times (Ayaz, 2021). Globalization affects the advancement of information and communication technology, providing faster development and allowing the application of more efficient and effective methods for the dynamics of life, such as carrying out production, distribution, and consumption activities of goods and services (Bilan et al., 2023).

The evolution of science and technology has ushered humanity into an era profoundly shaped by information and communication technology (Bilan et al., 2023). With the advent of Industry 4.0, the utilization of information and communication technology has become increasingly pervasive, as it streamlines human daily activities and enhances the acquisition and dissemination of information among individuals (Tyagi & Kumari, 2024; Vashishth et al., 2024).

In response to the substantial development of information and communication technology, governments must leverage these tools as methodologies for conducting governmental operations. Information and communication technology plays a pivotal role in the government's transition from conventional to electronic-based governance (Supriadi et al., 2024). These electronic-based activities provide unrestricted freedom from spatial and temporal constraints, enabling digital government operations to be conducted anywhere and at any time (Shaban, 2024). Through the implementation of information and communication technology, various governmental activities can be executed with enhanced ease and efficiency, thereby fostering a transparent governmental environment. Government initiatives related to information and communication technology utilization effectively encourage the implementation of comprehensive governmental reforms (Latupeirissa et al., 2024).

The development of information and communication technology in the current global context greatly determines the success and progress of a country, as governments around the world are trying to adapt to apply technology and communication. This is known as Electronic Government or in Indonesian commonly referred to as the Electronic-Based Government System (SPBE).

Aligned with central and local government objectives in achieving national development, it is imperative to implement contemporary governmental systems. Given the rapid advancement of information and communication technology, governments are expected to realize Good Governance—an implementation of responsible development management that adheres to democratic, effective, and efficient principles. Furthermore, governments must embody participatory, transparent, and equitable principles for all communities to achieve societal and national prosperity (Supriadi et al., 2024). To realize this welfare, governments must provide communities with transparent information. The dissemination of clear information to the public necessitates accessible digital platforms that align with contemporary understanding and accessibility standards (Botelho, 2021).

Electronic Government or the Electronic-Based Government System (SPBE) represents a strategic initiative designed to enhance governmental operational effectiveness (Supriadi et al., 2024). This involves restructuring managerial systems and work processes within government through the optimization of information and communication technology utilization. Electronic Governance constitutes the application of information and communication technology by governments to serve communities, with the expectation of achieving efficiency, effectiveness, transparency, and enhanced public accessibility to governmental services.

The development of Electronic Government in Indonesia has become increasingly prominent, with implementation based on the government's commitment to providing public convenience in obtaining information and receiving optimal community services (Utama, 2020). The Indonesian Government demonstrated this commitment by issuing Presidential Instruction (*INPRES*) No. 3 of 2003 concerning National Policies and Strategies for Electronic Government Development, establishing the legal foundation for all Electronic Government

framework policies. Following this regulation's implementation, government websites experienced significant growth, totaling 472 websites comprising 37 central government websites, 32 non-departmental government institution websites, and 403 local government websites. This represents a substantial increase from the pre-regulation period, when only 322 government websites existed, consisting of 37 central government, 32 non-departmental government institutions, and 253 local government websites. Currently, all government agencies from national to regional levels maintain operational websites.

Based on Presidential Regulation Number 95 of 2018, all state administrators from central to regional levels are mandated to implement Electronic Government in an integrated manner, marking a new era in governmental affairs management and community service provision. This governmental system digitalization serves as a mechanism for realizing bureaucratic reform that impacts public service excellence (Kuhlmann, 2023; Latupeirissa et al., 2024). Optimal Electronic Government implementation results in system integration, providing governance effectiveness and efficiency. Within the context of the Industrial Revolution 4.0 era, implementing and developing Electronic Government is essential for governments as state administrators (Peng, 2022).

The implementation of Electronic Government or the Electronic-Based Government System by Makassar City Government is governed by Makassar Mayor Regulation Number 84 of 2022 concerning Electronic-Based Government System Implementation in Regional Government (Mardianto et al., 2025). This regulation serves as a guideline for SPBE implementation within Regional Government to achieve effective local governance. According to the Minister of Internal Affairs' Decree on SPBE Evaluation Results for Central and Regional Agencies in 2023, issued on January 11, 2024, Makassar City achieved an SPBE score of 3.41, categorized as "good." This achievement positions Makassar City as superior to all Regional Governments in South Sulawesi. The Mayor of Makassar expressed appreciation and gratitude for these results, hoping this achievement will encourage continued innovation for Makassar City's advancement. Electronic Government or the Electronic-Based Government System (SPBE) provides opportunities to promote and realize open, participatory, innovative, and accountable government implementation while facilitating increased collaboration between government agencies in executing governmental mandates and responsibilities (Marbun et al., 2025).

This study presents significant novelty by providing comprehensive analysis of Electronic Government (e-Government) implementation at the sub-district level, specifically examining Tamalate District in Makassar City—a governance level that has received limited academic research attention. The research reveals critical gaps between policy formulation and practical implementation, highlighting real-world challenges including inaccessible government websites (https://appasimata.id or http://web.tamalatekec.makassarkota.go.id/) due to unpaid service providers and inadequate public information dissemination, which directly compromises transparency and accessibility principles. Additionally, the study identifies dual challenges confronting local governments: uneven digital literacy among human resources and suboptimal ICT infrastructure conditions regarding quality and maintenance (Omweri, 2024). These findings provide novel insights and practical recommendations applicable to other regions experiencing similar conditions, thereby contributing to broader discourse on digital government transformation at Indonesia's local level in contextually relevant and practically applicable ways.

Based on the explanation and background description, it is essential to conduct research on "Analysis of Electronic Government Implementation in Tamalate District, Makassar City" to ensure Electronic Government Implementation can be executed optimally and according to established standards.

2 | METHOD

This research was conducted in Tamalate District, Makassar City, employing a qualitative research methodology. This methodological approach was selected due to its capacity to facilitate in-depth and contextual exploration of social phenomena, particularly in understanding the intricate dynamics of electronic government implementation at the local governance level (Anthopoulos & Reddick, 2016). Through qualitative methodology, researchers can

comprehensively capture the perspectives, behaviors, and experiences of diverse stakeholders—including public officials and community members—in ways that transcend the limitations of quantifiable numerical data. This approach enables the identification of underlying factors that influence either successful implementation or present barriers to e-government adoption, including institutional culture, policy interpretation frameworks, and levels of public trust.

Data collection was conducted through four systematic techniques: observation, interviews, literature studies, and documentation. Each technique was systematically implemented to gather comprehensive and valid data. Direct observation was conducted within the Tamalate District office environment to examine digital service accessibility and management processes, including analysis of public interactions with administrative systems and platforms. This observational method provided real-time insights into operational dynamics and user engagement behaviors. Structured interviews were conducted with multiple key informants, including government staff, sub-district heads, and local residents, to obtain comprehensive insights and firsthand information regarding their experiences and perceptions of electronic government services. The interview process facilitated thorough understanding of implementation challenges and successes from diverse stakeholder perspectives. Literature studies encompassed comprehensive review of previous research, government regulations, academic journals, and relevant theoretical frameworks to strengthen analytical foundations and provide comparative bases for research findings (Mishra & Kumar, 2023). This systematic approach ensured theoretical grounding and contextual understanding. Documentation involved systematic collection of supporting data including official documents, reports, digital service outputs, and visual records of system interfaces and user interactions with digital platforms. This documentation provided tangible evidence of implementation processes and operational outcomes.

The research employed two primary data classifications: primary data and secondary data, ensuring comprehensive analytical triangulation. Primary data consisted of original information obtained directly from field observations and interviews, reflecting current conditions and authentic experiences of involved stakeholders (Manzano, 2016). These data were essential for understanding actual implementation processes, administrative challenges encountered, and levels of public engagement with electronic services. Primary data collection ensured research findings accurately represented contemporary realities and genuine stakeholder perspectives. Secondary data were systematically collected from existing sources including regulations, government policies, institutional reports, and prior academic studies. These sources served to support, enrich, and triangulate primary data findings, ensuring research validity and reliability. Secondary data provided crucial contextual background and comparative analytical frameworks.

Data analysis employed a systematic three-stage process: data reduction, data presentation, and verification leading to conclusion formulation (Li et al., 2018). The data reduction stage involved systematic filtering and organization of raw data collected from various sources, focusing exclusively on themes aligned with research objectives. This process facilitated pattern identification and eliminated redundant or non-essential information, enhancing analytical precision and ensuring research relevance. Data presentation was conducted through structured descriptive narratives and tabular formats, enabling enhanced visualization and interpretation of findings while facilitating identification of variable interconnections. This systematic presentation approach improved comprehension of complex data relationships. Verification and conclusion drawing were performed through continuous review of finding consistency, examination against theoretical concepts and empirical evidence, and formulation of comprehensive interpretations addressing research questions. The analytical process maintained iterative and reflective characteristics, ensuring well-founded, comprehensive conclusions relevant to observed field realities.

This comprehensive methodological framework was specifically designed to ensure scientific rigor while maintaining contextual relevance, enabling meaningful understanding of electronic government principles and applications within Tamalate District, Makassar City. The framework integrates multiple data collection methods

and analytical approaches to provide robust foundations for evidence-based conclusions and practical recommendations relevant to digital governance implementation at the local level.

3 | RESULT AND DISCUSSION

3.1| The Principles of Electronic Government

Effective and successful electronic government implementation must be grounded in fundamental principles that serve as strategic guidelines for development and execution, ensuring positive governance impacts (Hartanto et al., 2021). In contemporary public administration, these principles function not merely as operational guidelines but as strategic pillars ensuring the integration of digital transformation with public accountability, inclusivity, and long-term sustainability. Within a global context increasingly dominated by digital technologies, the significance of these principles is amplified, as they serve to balance technological innovation with governance ethics and citizen-centered service delivery. Beyond providing foundational frameworks, electronic government principles function as evaluative benchmarks for assessing the success and sustainability of digital transformation within public administration. As governments adopt technological solutions to streamline service delivery, the challenge extends beyond system deployment to ensuring alignment with democratic values and population needs (Bello, 2021).

This alignment necessitates a holistic approach combining technical infrastructure, regulatory frameworks, capacity development, and sustained community engagement to ensure electronic government development addresses existing bureaucratic inefficiencies rather than creating additional complexity layers. The core principles of electronic government encompass transparency, accessibility, efficiency and effectiveness, and information security (Anas et al., 2024; Islam & Sarker, 2025). These fundamental components must be understood as interconnected elements, where failure to maintain one principle may compromise the effectiveness of others, thereby emphasizing the critical importance of simultaneous, balanced implementation across all four domains.

Transparency represents a governmental condition characterized by clear information disclosure that remains easily accessible to various stakeholders. Transparency is established upon the foundation of widespread and unrestricted information flow (Hamid & Laundu, 2025). Within the e-government context, this necessitates digital platforms capable of delivering real-time data and updates in formats that are comprehensible and accessible to the public. Without meaningful transparency, public trust in digital governance deteriorates, and citizens become less likely to participate actively in governmental processes. The transparency principle can be measured through several key indicators: mechanisms guaranteeing system openness across all governmental work processes, mechanisms providing facilities for public inquiries regarding policy matters, and mechanisms facilitating information dissemination and reporting concerning community irregularities committed by government officials (Hamid & Laundu, 2025). These mechanisms must be institutionalized within legal frameworks and operational guidelines, supported by regular audits and evaluations to ensure effectiveness and responsiveness.

The Tamalate District Government implements transparency through various digital initiatives including public information dissemination via sub-district websites and social media platforms (Abrianti et al., 2021). Specific transparency measures include: provision of digital waste levy payment information, digital tax payment information systems, digital correspondence filing, digital financial management documentation, digital personnel information management, MSME information dissemination through sub-district websites, and online dissemination of general community issues. These initiatives represent concrete steps toward aligning local governance with digital transparency standards, although implementation scope remains partially limited (David et al., 2023).

Critical transparency deficiencies persist, particularly regarding public access to financial statements through the sub-district website. Community verification confirms this as a significant transparency enforcement shortcoming in electronic government implementation within Tamalate District. When financial information access is required, citizens must visit offices directly or access the Makassar City Regional Finance and Asset Management Agency (BPKAD) website. This information availability gap undermines holistic transparency objectives and indicates the necessity for enhanced data integration and inter-agency coordination in financial data management and publication (Okolo et al., 2022).

Transparency enforcement through electronic government in Tamalate District requires improvement through comprehensive public information provision to enhance community satisfaction. Strengthening digital transparency necessitates not only technical platforms but also regulatory mandates and administrative cultures supporting openness and accountability as core organizational values (Wu et al., 2021).

Accessibility describes the ease of access to services or products, serving as a crucial component for removing barriers and providing inclusive opportunities for all citizens without discrimination. Accessibility ensures equitable participation in digital governance processes and democratic engagement. The Tamalate District Government implements accessibility through multiple channels: sub-district government websites providing public access for services, reporting, and information retrieval; digital waste levy payment systems; digital tax payment platforms; and technical applications for employees to facilitate duty implementation.

Significant accessibility challenges persist, including periodic website inaccessibility as a primary electronic government method, limited digitally accessible service aspects, and insufficient government socialization regarding electronic government services. These limitations result in community unfamiliarity with digital government access mechanisms. Public access remains constrained by information security considerations, creating barriers to comprehensive digital engagement.

Accessibility principle enforcement in Tamalate District requires substantial improvement, particularly regarding community access provisions, enabling citizens to interact with government exclusively through electronic systems (Rahim & Abbas, 2024). This enhancement demands systematic approach addressing both technical infrastructure and community capacity development. Efficiency involves executing tasks correctly while conserving resources including effort, time, and costs, focusing on process optimization. Effectiveness concerns achieving predetermined goals and objectives, emphasizing outcome attainment. Electronic government was originally designed to enhance governmental operational efficiency and effectiveness through digital transformation. Government, as state administrator, requires simplified bureaucratic processes through online platforms (Cordella & Tempini, 2015). Efficiency and effectiveness can be identified through time, energy, and cost savings indicators benefiting both communities and sub-district bureaucracy (Jung, 2022). Citizens no longer require physical presence at Tamalate District offices for government access, as internet-connected communication devices suffice for government interaction and community need fulfillment. However, significant efficiency and effectiveness gains remain unrealized because electronic government implementation has not been comprehensively applied across all governmental aspects. Similarly, bureaucratic operations need not rely entirely on manual processes, as electronic systems can manage data and information systematically. Nevertheless, this digitization has not reached all government management and public service requirements.

Electronic government in Tamalate District requires systematic improvement to achieve optimal efficiency and effectiveness through comprehensive application across all governance and service aspects (Mannayong, 2024). Government entities require enhanced efficiency and effectiveness as both state management actors and public service providers.

Information security encompasses protective efforts against unauthorized access, information destruction, and data theft. Information security maintains critical importance as information represents valuable individual assets utilized for diverse interests and requirements. Tamalate District implements information security through

robust security systems for websites and digital applications. All governmental electronic equipment adheres to established standards for bureaucratic use. Electronic systems receive direct supervision and support from the Makassar City Communication and Information Office (*Diskominfo*) (Mannayong, 2024).

Information security principles in Tamalate District's electronic government remain suboptimal, resulting in public dissatisfaction. Citizens require broader governmental access and transparency while maintaining appropriate security standards. Tamalate District should improve information security quality to eliminate situations where security considerations restrict optimal public access and transparency (Syarif et al., 2024). This requires balancing legitimate security requirements with transparency and accessibility principles.

Table 1. Electronic government principles implementation in Tamalate District, Makassar City.

Principles	Implementations	Strengths	Weaknesses
Transparency	- Public info via website & social media - Digital waste & tax levy info - Digital filing systems (finance, correspondence, personnel)	- Initial digital presence - Digital records and payment transparency	- Financial statements not available online - Reporting mechanisms not public-friendly
Accessibility	- Website-based services - Digital payment for taxes and waste - Internal technical apps	- Reduced physical visits - Digital option availability	- Some websites inaccessible - Lack of digital literacy/socialization
Efficiency & Effectiveness	- Digital filing - Remote access to public services via internet	- Potential for cost and time savings - Reduced paperwork for staff	- Not all services digitized - Hybrid/manual systems still dominant
Information Security	- Systems supervised by Diskominfo - Security applied to websites and internal apps	- System security acknowledged - Equipment standards maintained	- Limited public access due to security restrictions - No clear public security policy published

3.2| Success Factors of Electronic Government Implementation

Successful electronic government implementation must systematically consider critical success factors that provide strategic guidance for development and execution, ensuring positive governance impacts. These success factors encompass two fundamental components: human resources (HR) development and information and communication technology (ICT) infrastructure optimization (Lazarević & Lukić, 2016). The synergistic integration of these factors determines the overall effectiveness and sustainability of digital governance initiatives at the local level. Human resources represent organizational assets requiring systematic training and development to facilitate positive and optimal organizational contributions. Organizations must demonstrate capacity to enhance teamwork effectiveness and professional competency among human resources to meet organizational requirements (Hidayat, 2025; Salas et al., 2015). In the context of electronic government, human resource quality directly correlates with digital transformation success and service delivery effectiveness.

To ensure human resource quality standards, Tamalate District mandates employee participation in educational programs, training sessions, and technical guidance related to Electronic-Based Government Systems (SPBE) or electronic government implementation (Supriadi et al., 2024). Additionally, the employee recruitment process incorporates stringent selection procedures to ensure recruited personnel possess comprehensive governmental understanding and digital technology proficiency.

Despite these initiatives, significant human resource quality deficiencies persist, particularly regarding proficiency in digital technology. Skill distribution remains uneven among employees, presenting ongoing implementation obstacles. Consequently, Tamalate District continuously strives to ensure equitable employee proficiency in digital technology utilization through sustained participation in electronic government-related training programs and professional development initiatives (Remmang et al., 2024).

The human resource factor in Tamalate District requires comprehensive quality improvement, particularly ensuring universal employee proficiency in digital device operation to achieve successful electronic government implementation. This enhancement necessitates systematic capacity-building programs, continuous professional development, and performance evaluation mechanisms aligned with digital governance objectives.

Information and Communication Technology (ICT) infrastructure encompasses comprehensive technological systems utilized for information processing, storage, and dissemination. This infrastructure includes hardware components, software applications, and internet network systems. ICT infrastructure continues experiencing evolutionary developments that significantly impact human interaction, work processes, and learning dynamics (Oke & Fernandes, 2020; Shirowzhan et al., 2020). The electronic government success factor analysis reveals that Tamalate District's information technology infrastructure operates suboptimally regarding both quality and quantity parameters. Although all utilized devices meet established standards and maintain sufficient quantities, significant quality disparities exist across different technological components (Glavič, 2021).

Device quality remains inconsistent, and ICT infrastructure availability is compromised by equipment damage requiring immediate repair interventions (Khaled & Mcheick, 2019) to prevent task implementation obstacles that could result in bureaucratic disruptions and compromised public services. However, damage prevention mechanisms remain inadequate, failing to maintain consistent optimal device conditions (Almarri et al., 2023). Internet network connectivity presents particularly challenging obstacles due to unpredictable and uncontrollable variables, although Tamalate District ensures high-quality internet network utilization. These connectivity issues can significantly impact on service delivery continuity and user experience.

Tamalate District should implement comprehensive improvements to information and communication technology equipment quality while establishing preventive measures against ICT infrastructure damage. Regular maintenance protocols should be implemented before equipment failures occur, as prevention strategies prove more effective and cost-efficient compared to post-damage repair interventions. Successful electronic government implementation requires coordinated development of both human resources and ICT infrastructure. These factors operate synergistically, where deficiencies in one area can significantly compromise overall system effectiveness. Therefore, Tamalate District must adopt holistic improvement strategies addressing both components simultaneously.

4 | CONCLUSION

Based on the results of research and analysis conducted on the implementation of electronic government (e-government) in Tamalate District, Makassar City, it can be concluded that although the initiative to digitalize public services has shown progress, its application is still not optimal in several key aspects. The principles of e-government—transparency, accessibility, efficiency and effectiveness, as well as information security—have begun to be implemented, but remain face significant limitations.

The transparency principle is partially enforced through digital systems for information dissemination and financial documentation, yet critical public information, such as financial reports, remains inaccessible through the local website. The principle of accessibility is supported by the existence of websites and digital services, but problems such as inaccessibility of sites and lack of public awareness have hampered its effectiveness. Efficiency and effectiveness have not reached their full potential due to the limited coverage of digital services and the continued reliance on manual systems. Likewise, information security remains a concern, with limited public

access justified by security considerations, highlighting the need for improved protection mechanisms and clearer policies.

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Disclosure Statement

The author declares that there is no conflict of interest. All sources of information, data, and references used in this study have been properly acknowledged and cited. The opinions and conclusions presented are entirely those of the author and do not necessarily reflect the views of any institution or organization associated with the author or involved in the research setting.

Data Availability Statement

The data that support the findings of this study are available upon reasonable requests from the corresponding author. Due to confidentiality agreements and ethical considerations regarding the identities of interview participants and internal documents from the Tamalate District Government, full transcripts and raw data cannot be made publicly available. However, anonymized summaries of interview responses, field notes, and selected non-sensitive documentation used in the analysis are accessible for academic and research purposes. Requests for access can be directed to the corresponding author via email.

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