



Digital Transformation Challenges in Archipelagic Local Government Governance: A Literature Review

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Abstrak

Transformasi digital dalam tata kelola pemerintahan telah menjadi agenda strategis dalam upaya meningkatkan kualitas pelayanan publik, transparansi, dan akuntabilitas birokrasi. Dalam konteks wilayah kepulauan, implementasi transformasi digital menghadapi tantangan yang lebih kompleks dibandingkan dengan wilayah daratan, terutama karena keterbatasan geografis, infrastruktur, dan konektivitas. Artikel ini bertujuan untuk menganalisis secara kritis berbagai tantangan dalam transformasi digital pada tata kelola pemerintahan daerah kepulauan melalui pendekatan tinjauan literatur. Dengan menggunakan metode kualitatif berbasis studi literatur, penelitian ini mengkaji berbagai temuan dari penelitian terdahulu yang relevan dengan implementasi e-government di wilayah kepulauan. Hasil kajian menunjukkan bahwa transformasi digital di daerah kepulauan umumnya masih berada pada tahap awal dan cenderung bersifat administratif-prosedural, belum mencapai transformasi substantif dalam tata kelola pemerintahan. Beberapa faktor utama yang menjadi kendala meliputi keterbatasan infrastruktur digital, rendahnya kapasitas sumber daya manusia, kesenjangan akses teknologi, serta dominasi pendekatan kebijakan yang bersifat top-down.

Kata kunci: Transformasi Digital, E-Government, Wilayah Kepulauan

Abstract

Digital transformation in governance has become a strategic agenda in efforts to improve the quality of public services, transparency, and bureaucratic accountability. In the context of archipelagic regions, the implementation of digital transformation faces more complex challenges compared to mainland areas, particularly due to geographical constraints, limited infrastructure, and connectivity issues. This article aims to critically analyze various challenges in digital transformation within regional governance in archipelagic areas through a literature review approach. Using a qualitative method based on literature studies, this research examines findings from previous studies relevant to the implementation of e-government in archipelagic regions. The results of the review indicate that digital transformation in archipelagic regions generally remains at an early stage and tends to be administrative-procedural in nature, not yet achieving substantive transformation in governance. Several key challenges include limited digital infrastructure, low human resource capacity, disparities in technology access, and the dominance of top-down policy approaches.

Keywords: Digital Transformation, E-Government, Archipelagic Regions.



INTRODUCTION

Over the past two decades, digital transformation has emerged as a key pillar of public administration reform across various countries. Governments are no longer expected merely to perform conventional administrative functions; they must also adapt to increasingly disruptive developments in digital technology (Kushendar et al., 2026). Digitalization is understood not merely as the adoption of technology, but as a fundamental shift in how governments design policies, manage resources, and deliver services to the public (Rojabi, 2025).

In Indonesia, the commitment to digital transformation is reflected in the Electronic-Based Government System policy (Kencono & Handoko, 2024). However, the implementation of this policy reveals significant regional disparities. Urban areas tend to be more adaptable to digital transformation compared to underdeveloped, frontier, and outermost (3T) regions, including archipelagic areas.

Archipelagic regions possess unique and complex geographical characteristics. Their composition consisting of scattered small islands results in limitations regarding accessibility, infrastructure, and digital connectivity. In this context, digital transformation is not merely a policy choice but a strategic necessity to bridge geographical isolation. Yet, these same conditions present structural challenges that are difficult to overcome.

Conceptually, digital transformation in government should not focus solely on technology adoption; it must also encompass a shift in governance paradigms toward a more collaborative, adaptive, and responsive model (Setiawan, 2025). The New Public Governance approach emphasizes the importance of multi-actor engagement in governance processes, while the concept of digital government demands system integration, data utilization, and service innovation driven by community needs.

Although the policy direction and conceptual framework for digital transformation have been clearly defined, implementation in archipelagic regions continues to face various complex challenges. A primary issue is the suboptimal state of information and communication technology infrastructure a fundamental prerequisite for the digitalization of public services. Limited internet coverage, poor inter-regional connectivity, and the high cost of infrastructure development in archipelagic areas constitute significant obstacles.

Furthermore, human resources represent a critical challenge. The capacity of local government officials to manage and operate digital systems remains relatively limited, particularly regarding both digital literacy and technical skills. This has resulted in suboptimal utilization of existing systems, meaning that digitalization tends to remain administrative in nature rather than being fully oriented toward improving the quality of public services.

Another equally important issue is the lack of optimal system integration and inter-agency coordination. Policy fragmentation and the use of disjointed digital applications have led to system duplication and inefficiencies in data management and service delivery. This situation indicates that digital transformation has not yet been fully accompanied by the shift toward integrated and collaborative governance—a change envisioned under the paradigms of digital government and New Public Governance.

Thus, although digital transformation is viewed as a strategic solution to overcome geographical limitations in archipelagic regions, its implementation still faces a gap between policy and practice on the ground. This gap warrants further study, particularly to identify the factors influencing the success of digital transformation in archipelagic areas and to formulate strategies that are more contextual and sustainable.

METHODOLOGY

This study employs a qualitative approach using a literature review method to analyze the challenges of digital transformation in the governance of archipelagic local governments. The review is designed to synthesize findings from previous research and identify patterns, gaps, and key issues related to digital governance in regions characterized by fragmented geography.

Data were collected from secondary sources, including reputable scholarly journal articles,

international reports, and official government documents. The literature search was conducted using academic databases such as Google Scholar, Scopus-indexed journals, and other relevant digital repositories. Keywords used in the search included "digital transformation," "e-government," "archipelagic governance," "local government," and "public service digitalization.

To ensure the quality and relevance of the selected literature, this study applied specific inclusion and exclusion criteria. Inclusion criteria comprised: (1) articles published between 2015 and 2025 to capture recent developments in digital transformation; (2) peer-reviewed journal articles indexed in reputable databases (Scopus, Web of Science, or accredited national journals); (3) research focusing on digital governance, e-government implementation, or public sector digitalization; and (4) studies conducted in regions facing geographical challenges, particularly archipelagic or remote areas.

Meanwhile, exclusion criteria included: (1) non-peer-reviewed articles, such as opinion pieces, blog posts, or non-academic reports; (2) research that did not specifically address governance or public sector contexts; and (3) literature focusing solely on the technical aspects of information systems without linking them to governance issues. and (4) duplicate publications or articles lacking methodological clarity.

The selected articles were subsequently analyzed using qualitative content analysis. This process involved three main stages: data reduction (selecting and grouping relevant information), data presentation (organizing findings into thematic patterns), and drawing conclusions (interpreting the relationship between digital transformation challenges and governance dynamics). Through this systematic approach, the study aims to provide a comprehensive and analytical understanding of digital transformation challenges within the governance of archipelagic local governments.

RESULTS AND DISCUSSION

Digital transformation in government governance within archipelagic regions exhibits dynamics distinct from those in mainland areas, primarily due to geographical factors, infrastructure limitations, and uneven institutional capacity. Findings by Sholeh et al. (2025) indicate that digital transformation in archipelagic regions remains in its early stages, specifically at the levels of digitization and limited digitalization. This aligns with Electronic-Based Government System (SPBE) index scores across various archipelagic regions, which generally fall within the "fair" to "good" categories (ranging from 2.6 to 3.2) but have yet to achieve a level of integrated digital transformation (Ministry of PANRB, 2023).

These conditions suggest that technology utilization remains focused on digitizing existing administrative processes, without accompanying fundamental changes to business processes or public service structures. Consequently, digital transformation has not yet fully generated the public value expected within the digital government framework.

Furthermore, implementation gaps are evident regarding infrastructure and connectivity. Archipelagic regions face serious challenges concerning limited internet network access. Data from the Ministry of Communication and Informatics indicates that in 3T regions (underdeveloped, frontier, and outermost areas)—most of which are archipelagic approximately 20–40% of areas still experience "blank spots" or unstable network quality (Kominfo, 2022). These limitations directly impact the accessibility of digital services for both the public and government officials, resulting in a continued heavy reliance on manual mechanisms for public services.

In addition to infrastructure issues, information system fragmentation poses a significant challenge to the implementation of digital transformation. Various government applications developed by both central and regional governments tend to operate in silos and lack integration. Examples of commonly used systems that are not yet fully interconnected include SIAK (Population Administration Information System), SIPD (Regional Government Information System), e-Planning, and e-Budgeting, as well as various other sectoral service applications. This situation leads to data duplication, increased workloads for government officials, and low service efficiency (Bappenas, 2021).

On the other hand, limited human resource capacity further exacerbates barriers to digital transformation. Digital literacy levels among government officials in archipelagic regions remain uneven, particularly at the operational level in sub-districts and villages. Many officials still rely on specific operators to manage digital systems, while the training provided tends to be generic rather than tailored to local conditions (Ministry of PANRB, 2022). Consequently, technology utilization falls short of its potential, even where infrastructure and applications are already in place.

From a governance perspective, digital transformation in archipelagic regions also reveals a lack of collaboration among stakeholders. Policy implementation remains dominated by a top-down approach, with relatively limited involvement from the private sector, local communities, and academia. Yet, in an archipelagic context, collaboration with network providers, local actors, and educational institutions is crucial for addressing resource constraints and fostering innovation driven by local needs (Ansell & Gash, 2008).

Other findings indicate a tendency toward "symbolic adoption" in digital policy implementation. Many digital initiatives are developed to meet formal Electronic-Based Government System (SPBE) indicators but are not matched by optimal utilization in actual public service delivery. This is evidenced by applications that are underused and a lack of evaluation regarding the policy's impact on the community (Ramadan et al., 2025). Thus, digital transformation tends to be administrative in nature rather than oriented toward creating substantive public value.

Furthermore, the digital divide in archipelagic regions extends beyond infrastructure access to encompass aspects of digital literacy and technology usage among the public. Limited internet access, low digital proficiency, and reliance on local intermediaries point to a risk of social exclusion in the implementation of digital-based services (van Dijk, 2020). If left unaddressed, this situation could widen the gap in public service quality across different regions. Overall, the study's findings indicate that the challenges of digital transformation in archipelagic regions are structural and systemic in nature. Infrastructure limitations, system fragmentation, low human resource capacity, and policy approaches that lack contextual relevance create an interconnected cycle of issues. Therefore, digital transformation in archipelagic regions cannot be understood merely as technology adoption; rather, it is a governance issue requiring policy interventions that are holistic, adaptive, and grounded in the region's specific characteristics.

CONCLUSION

Digital transformation in government governance within archipelagic regions requires an approach that is not merely normative but also operational and contextual, aligning with unique geographical characteristics. Various constraints such as uneven connectivity, inter-island isolation, and limited institutional and human resource capacities demonstrate that administrative digitization alone is insufficient to drive substantive transformation. Therefore, more targeted strategic measures are required:

1. Strengthening maritime connectivity-based infrastructure. Local governments cannot apply the same standards for network deployment used on the mainland to archipelagic regions. Digital infrastructure development must be tailored to geographical realities (scattered islands, extreme weather, limited access) through solutions such as satellite technology, radio networks, or hybrid networks.
2. Comprehensive reform of public service business processes. Service workflows must be simplified into end-to-end digital systems, particularly in priority sectors such as healthcare, social assistance, and population administration that are most significantly impacted by geographical conditions.
3. Strengthening multi-level and multi-sector collaboration. Collaboration among the central government, network providers, the private sector, and local communities is essential to overcome infrastructure and funding limitations.

4. Integrating social and cultural approaches into the digital transformation process. This ensures alignment with the character of archipelagic communities, which are rooted in social closeness and trust.
5. Implementing policy prioritization based on regional disparities. By mapping the digital readiness of each island, interventions can be executed in a phased, targeted, and efficient manner.

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