Check for updates

Government & Resilience

Journal Homepage: https//journal.dealingsfoundation.com/index.php/GR/
ISSN: 3032-2820 (Online) / 3032-7601 (Print)

Governing through Complexity: Resilience and the Hidden Work of Digital Transformation in Barru, Indonesia

Andi Muhammad Ishak Ismail[1]*, Safaruddin[1], and Ishaq Yunus[2]

[1]Institut Teknologi Bisnis dan Administrasi Al Gazali Barru, Indonesia
[2]Pemerintah Kabupaten Mamuju Tengah, Indonesia

*Corresponding Author Email: anchaliccha19@gmail.com , No Telp: +62 852 4227 9237;

Received: 21 August 2026; Revised: 26 September 2026; Accepted: 27 September 2026

Abstract

The escalation of demands for digital transformation have driven the government to integrate technology into public service delivery. However, nationally standardized digital systems are implemented in local contexts characterized by uneven infrastructure, varying human resource capacities, and unequal public access. These conditions create new demands for frontline organizations, particularly when nationally mandated digital requirements must be translated into daily service practices. This study analyzes how Community Health Centers (Puskesmas) in Barru Regency, acting as frontline organizations, adapt to digital transformation and how this adaptation process reflects resilience in local public service delivery. The study employs a qualitative case study approach. The findings reveal that digital transformation does not merely replace existing service mechanisms but also generates additional implementation tasks at the frontline level, including workflow adjustments, data management, technical troubleshooting, user support, and inter-agency coordination. Health centers respond to these demands by combining digital systems with adaptive service practices to maintain service continuity and accessibility. The findings indicate that resilience in digital public service transformation is not primarily reflected by an organization's level of digitalization, but rather by the frontline organization's capacity to absorb and adjust to new implementation demands without disrupting service continuity. This study contributes to the field of resilience governance by shifting the focus from the benefits of digitalization to the distribution of implementation tasks across different levels of government. It also underscores the importance of formulating digital transformation policies that take into account local implementation capacities and the organizational demands placed on frontline public service providers.

Keywords: Public Administration Reform, New Public Management, E-Government Servies

How to Cite: Ismail, A. M. I., Safaruddin, & Yunus, I. (2026). Governing through complexity: Resilience and the hidden work of digital transformation in Barru, Indonesia. *Government & Resilience, 4*(2), 283-305. https://doi.org/10.62503/gr.v4i2.117

Copyright © 2026 by Authors, Published by Dealings Publishing. This work is licensed under the CC BY-NC-SA 4.0 (https://creativecommons.org/licenses/by-nc-sa/4.0).

Introduction

Existing literature positions the digital transformation of public services as a means to enhance the efficiency of bureaucratic tasks and improve government integration and responsiveness to the public's needs (Alia & Jaradat, 2025; Alshawaaf & Alzougool, 2025a; Eren & Duman, 2025). However, when digital standards and systems are established at the national level, their implementation does not occur under uniform institutional conditions across regions due to institutional diversity, technological readiness, and resource disparities (Abdelhakim et al., 2022; Androniceanu, 2023; Bravo Rojas et al., 2024). This complexity places an increasing burden on local government bodies, particularly frontline units, that must translate these demands into day-to-day service delivery. This involves adjusting workflows, managing data, resolving technical issues, assisting users, and coordinating with various stakeholders (Bakkeli, 2023; Prastio & Masania, 2026; Umarova, 2025). This situation demonstrates that digital transformation not only alters the way services are delivered but can also change who performs the adaptation work and at what level that work is undertaken (Putri Nugraha et al., 2026). From the perspective of resilience governance, an organization's ability to absorb and adapt to such demands is crucial; the success of a transformation is determined not only by the availability of digital systems but also by the capacity of frontline organizations to maintain service continuity when digital standards encounter diverse local conditions (Abdillah et al., 2025a; Kumaraswamy et al., 2025). Thus, attention is directed toward the adaptation process occurring at the organizational level as digital transformation policies are translated from national standards into local service practices.

Digital transformation is increasingly becoming part of public service delivery; however, this growth has not been matched by a corresponding expansion of technology, resulting in disparities in access and capacity. In 2024, approximately 5.5 billion people (or 68% of the global population) used the internet, while 2.6 billion remained offline, revealing a widening gap between urban and rural areas; only 48% of the rural population used the internet, compared to 83% of the urban population (International Telecommunication Union, 2024). In Indonesia, nearly all public service sectors are being urged to undergo digital transformation; the health sector is no exception, facing a mandate to integrate Community Health Center Management Information Systems (SIMPUS) with SATUSEHAT. However, the Ministry of Health acknowledges that not all regions have been able to implement this due to challenges regarding internet connectivity, human resource capacity, and budget constraints. As of September 2023, the implementation of Electronic Medical Records had reached only 62.5% of the target, and just 44.5% of facilities were connected to SATUSEHAT (Health Development Policy Agency, 2024). This situation closely mirrors conditions in Barru Regency, where the local government is required to undergo a digital transformation by 2025 yet continues to struggle with efforts to extend internet connectivity to remote areas, essential for supporting public services, including the health sector, while 4G network coverage was only officially launched in Harapan Village, Tanete Riaja District, as recently as August 2025 (Barru Regency Government, 2024). This limitation in supporting capacity is also evident at the level of healthcare service organizations. Data from the Ministry of Health indicates that out of 12 Community Health Centers (Puskesmas) in Barru Regency, only four (33%) meet the standards for human resource completeness, while eight (67%) do not yet meet these standards, as illustrated in Figure 1.

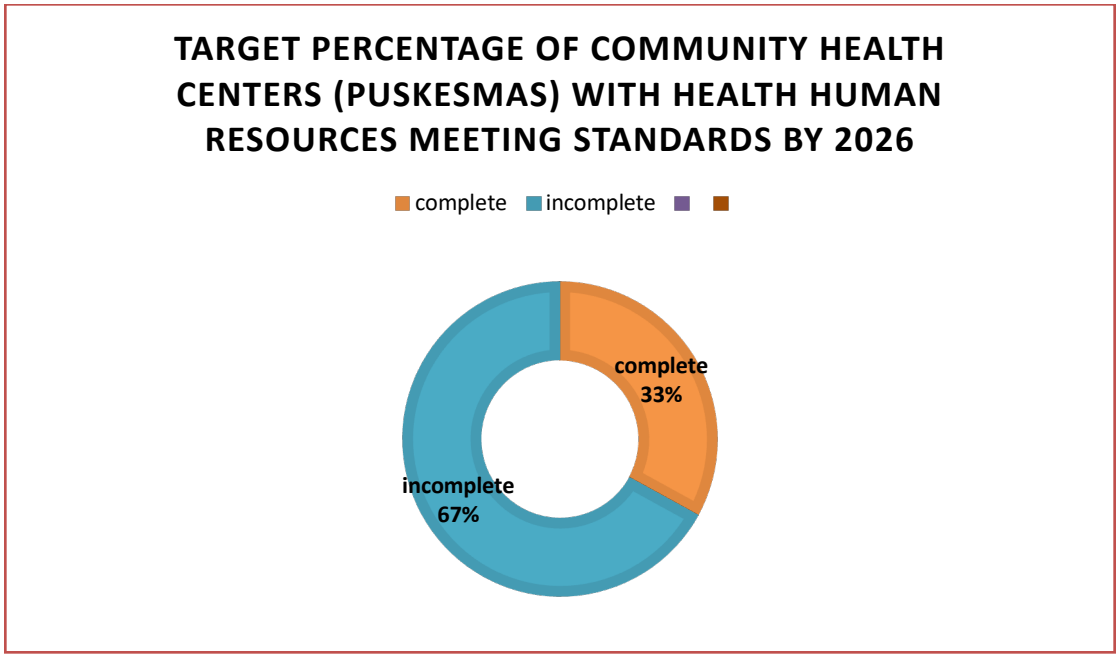


Figure 1. Percentage of Community Health Centers with Health Human Resources Meeting Standards in Barru Regency (2026). Source: Directorate General of Health Workforce, 2026.

Based on Figure 1, regarding the Information Technology/Medical Records personnel category, only five Community Health Centers (Puskesmas) are recorded as having staff in this category, while seven report no available personnel in this category. This situation indicates that the demands of digitalization are reaching frontline organizations where human resource capacity is not entirely uniform. Details regarding the human resource situation at each Community Health Center in Barru Regency are presented in Table 1.

Table 1. Human Resource Availability and Completeness across Puskesmas in Barru Regency

Puskesmas	Location	Service Type	HR Completeness	IT/Medical Records Personnel	Finance/Administration Personnel
Padongko	Urban	Inpatient	Complete	1	1
Pekkae	Urban	Inpatient	Not complete	2	0
Pancana	Rural	Inpatient	Complete	1	1
Palakka	Rural	Inpatient	Not complete	0	0
Mangkoso	Rural	Inpatient	Not complete	0	1
Madello	Rural	Inpatient	Not complete	0	1
Lisu	Rural	Inpatient	Complete	1	1
Ralla	Rural	Inpatient	Not complete	0	0

Pujananting	Rural	Inpatient	Not complete	0	1
Doi-Doi	Rural	Inpatient	Not complete	0	1
Palanro	Rural	Inpatient	Complete	1	1
Bojo Baru	Urban	Inpatient	Not complete	0	0

Source : Directorate General of Health Workforce, 2026.

Based on Table 1, organizational readiness to meet the demands of digitalization varies across the Community Health Centers (Puskesmas) in Barru Regency. While some centers have staff dedicated to information technology and medical records, others report no personnel in these categories. This disparity is significant because implementing a digital system entails more than just providing a platform; it requires organizational capacity to operate the system, manage information, and align service processes with digital requirements. Given these varying capacities, the relatively uniform digital mandates established at the policy level can result in distinct implementation needs at the individual health center level. Consequently, it is crucial to examine not only whether digitalization has been implemented but also the specific tasks that emerge during the implementation process and how those tasks are managed at the frontline level.

Literature on government digital transformation has expanded, focusing on the benefits of digitalization, technological readiness, organizational capacity, and factors hindering implementation (Daßler et al., 2024; Güler & Büyüközkan, 2023; Khamiliyah et al., 2025). In the context of local government, research frequently identifies digital infrastructure, human resource competence, leadership, institutional support, interoperability, and the digital divide as factors influencing the successful implementation of digital systems (Dumitrescu, 2025; Kurniawan et al., 2023). Other studies show that digitalization can improve efficiency and access to services, but its implementation can also result in system fragmentation, limited interoperability, rigid procedures, and the continuation of manual work (Alshawaaf & Alzougool, 2025b; Geada, 2021; Casalino et al., 2021; Lolich & Timonen, 2022). Meanwhile, the study of resilience governance focuses primarily on how government organizations build the capacity to absorb disruptions, adapt to change, and maintain service continuity (Georgiou, 2024; Lutz & Schutte, 2025; Pham & Vu, 2025). However, existing discussions have not sufficiently explained how digital mandates, formulated and standardized at higher levels, alter the distribution of work and implementation burdens when applied at local and frontline organizational levels. Attention to this issue is crucial because policy implementation entails not only deploying a designed system but also a range of tasks: adapting the system to local conditions, managing technical issues, meeting data requirements, supporting users, and ensuring service continuity. Consequently, digital transformation should be viewed not merely as a technological shift or a means to enhance performance, but also as a process that redistributes implementation tasks across different levels of government. This study of Community Health Centers (Puskesmas) in Barru Regency examines this dynamic, exploring how the distribution of work unfolds and how frontline organizations respond to it in the context of service delivery.

Addressing these issues, this study aims to analyze how digital transformation alters the distribution of work and implementation burdens among the central government, local governments, and Community Health Centers (Puskesmas), as well as how these centers absorb and manage such demands to maintain service continuity. The study poses three questions: (1) what demands, tasks, and responsibilities arise during the implementation of digital transformation in Community Health Centers in Barru Regency?; (2) how are these tasks and implementation burdens distributed or shifted across different levels of government, and how do the centers respond to them in daily service

delivery?; and (3) what governance strategies are required to achieve a more proportional distribution of responsibilities, support, and implementation burdens within healthcare digital transformation? With this focus, the study contributes to the field of digital transformation by shifting attention from technological outcomes and adoption rates to the distribution of work accompanying implementation. It also expands the study of resilience governance by demonstrating that resilience in frontline organizations relates not only to the capacity to withstand disruptions but also to the ability to absorb and manage implementation demands that emerge when digital policies are translated into local practice. At the policy level, the findings provide a basis for designing digital transformations that go beyond merely establishing centralized standards and systems; they also advocate for a division of responsibilities, support, and resources that aligns with the implementation work required at local and frontline levels.

Theoritical Framework

The evolving literature on digital transformation in the public sector positions the process not merely as the adoption of technology and digital media, but as a comprehensive transformation affecting work processes, services, organizational structures, and the relationship between the government and service users. According to Mergel et al. (2019), digital transformation is viewed as a holistic effort to change how public organizations operate and deliver services, while subsequent literature increasingly emphasizes that digital change can be either incremental or transformative, affecting organizational structures and practices. In this study, digital transformation is used to understand the changes in service demands and practices arising from the implementation of digital systems in Community Health Centers (Puskesmas), rather than merely to measure the level of technology adoption. This concept serves as a starting point for examining how changes designed through the digital agenda subsequently give rise to new job requirements and shifts in responsibilities at the local implementation level.

Public service delivery emphasizes the distribution of tasks; specifically, the "redistribution of implementation work" refers to changes or shifts in task distribution required to translate and execute a policy as it moves across levels of government and implementing organizations (O'Toole & Montjoy, 1984). This concept stems from the understanding of policy implementation, specifically, that the execution of a policy does not end with the decisions or standards established by policymakers but requires administrative, coordinative, technical, and service-related work performed by actors at the implementation level (Sager & Gofen, 2022). Developments in the study of policy implementation and street-level bureaucracy demonstrate that frontline actors play a crucial role in translating policy into practice, as they deal directly with the needs and circumstances of service users (Litchfield et al., 2023). In this study, this concept was selected to examine how digital transformation mandates formulated at the national level generate and distribute implementation tasks to local governments and Community Health Centers (Puskesmas), including data management, procedural adjustments, the resolution of system issues, user support, and inter-agency coordination (Safaruddin, Andi Muhammad Ishak, et al., 2026). This concept lies at the heart of the research because it enables the analysis of questions concerning not only whether digitalization is implemented, but also how the work required to make digitalization operational is allocated and borne across various levels of government.

Resilience governance refers to the governance capacity to cope with change, absorb shocks, adapt institutional practices, and maintain service delivery functions when the conditions of governance shift (Abdillah et al., 2025a). The evolution of resilience literature in governance has shifted from an initial understanding emphasizing the ability to withstand disruptions toward a focus on adaptation, learning, flexibility, and the capacity to maintain functions amidst ongoing change (Li

et al., 2026). In this study, resilience governance is employed to understand how Community Health Centers (Puskesmas) respond to the demands and additional tasks arising from digital transformation, particularly when local capacities and conditions diverge from the assumptions underlying policy design. This concept is not applied to assess whether these centers are "resilient" in a general sense, but rather to analyze how frontline organizations absorb, adapt to, and manage the redistribution of implementation tasks to ensure service continuity. Thus, resilience governance complements the concept of the redistribution of implementation work by elucidating institutional responses to the shifts in task distribution brought about by digital transformation.

These three concepts are interconnected in explaining the process of change that occurs when digital transformation is applied to local public services. Digital transformation serves as the starting point for examining the emerging demands and shifts in service systems and practices; these demands are then analyzed through the concept of the "redistribution of implementation work" to identify how tasks, responsibilities, and implementation burdens are distributed among the central government, local government, and Community Health Centers (Puskesmas). Subsequently, "resilience governance" is employed to understand how these health centers absorb and manage the consequences of this work distribution through practice adjustments, problem-solving, and the reconfiguration of service processes. The interplay among these concepts allows the research to trace the trajectory from the changes driven by digitalization and the associated redistribution of work to the organizational responses to that distribution; thus, this conceptual framework explains not only how digitalization is implemented but also how the process transforms government work and how frontline organizations maintain service continuity amidst evolving demands.

Research Methods

Research Design & Data Collection

This study employs a qualitative design based on secondary data to gain a comprehensive understanding of the digital transformation process and the redistribution of implementation tasks at the Community Health Center (Puskesmas) level in Barru Regency. Secondary data, comprising policy documents, regulations, government reports, service records, and publications related to healthcare service digitalization, were utilized to understand policy mandates and compare them with local-level practices. The use of diverse secondary data sources enabled source triangulation by comparing information across policy documents, regulations, government reports, institutional records, service data, and relevant academic publications. This approach allowed for an analysis of the distribution of implementation tasks that goes beyond reliance on a single document type, instead tracing the interconnections between national-level policies, regional-level implementation documents, and service practices at the Puskesmas level. The specific data sources used in this study are detailed in Table 2.

Table 2. Data Collection

Type of Document	Data obtained	Sources	Relevancies
Government report/press release	Data on national digital health requirements, SATUSEHAT interoperability and registration procedures, RME system requirements, health	Ministry of Health of the Republic of Indonesia. (2024a). *Interoperability. SATUSEHAT Platform*. Accessed in August, 2026. https://satusehat.kemkes.go.id/platform/docs/id/interoperability/? Ministry of Health of the Republic of Indonesia. (2024b). What is SATUSEHAT? SATUSEHAT Platform. Accessed in August, 2026.	These sources provide the empirical and policy context for examining how digital transformation requirements are translated and

	workforce capacity in Barru, digital service implementation, and local digital infrastructure development.	https://satusehat.kemkes.go.id/platform/docs/id/playbook/introduction/ Ministry of Health of the Republic of Indonesia. (2025a). *Health facilities. SATUSEHAT Platform*. Acessed in August, 2026. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/regis-institution/ Ministry of Health of the Republic of Indonesia. (2025b). *Registration guide. SATUSEHAT Platform.* Accessed in August, 2026. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/? Ministry of Health of the Republic of Indonesia. (2025). *Select the medical record system (RME). SATUSEHAT Platform.* Accessed in August, 2026. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/regis-institution/select-system-rme/ Ministry of Health of the Republic of Indonesia. (2026). *Terms and privacy. SATUSEHAT Data*. Accessed in August, 2026. https://satusehat.kemkes.go.id/data/terms-and-privacy Directorate General of Health Workforce, M. of H. of the R. of Indonesia. (2026). *Percentage of health centers with health workforce meeting the required standards: Barru Regency, South Sulawesi.* Accessed in August, 2026. https://eplanning-ditjennakes.kemkes.go.id/indikator/user/persentase_terpenuhi/SKMPKM/prov/73/kab/7311 Barru Regency Government. (2020). *BPJS Health states that health center service registration in Barru will be conducted online*. Accessed in August, 2026. https://barrukab.go.id/pihak-bpjs-kesehatan-sebut-pendaftaran-layanan-puskesmas-di-barru-bakal-online/ Barru Regency Government. (2024). *Strengthening digital access, the Regent of Barru inaugurates 4G network in Tanete Riaja*. Accessed in August, 2026. https://barrukab.go.id/perkuat-akses-digital-bupati-barru-resmikan-jaringan-4g-di-tanete-riaja/ Barru Regency Government. (2025a). *Accelerating digital transformation, Barru Regency Government establishes strategic cooperation with Telkom to strengthen internet connectivity*. Accessed in August, 2026. https://barrukab.go.id/percepat-transformasi-digital-pemkab-barru-jalin-kerja-sama-	distributed across central government, local government, and Puskesmas frontline implementation in Barru, including the resulting infrastructure, workforce, and service-delivery demands.

		strategis-dengan-telkom-perkuat-jaringan-internet/? Barru Regency Government. (2025b). *Barru Regency Government promotes the optimization of local revenue through improvements in property tax, markets, and health services*. Accessed in August, 2026. https://barrukab.go.id/pemkab-barru-dorong-optimalisasi-pad-lewat-pembenahan-pbb-pasar-dan-layanan-kesehatan/ Barru Regency Health Office. (2026). *Community health centers (Puskesmas)*. Accessed in August, 2026. https://dinkes.barrukab.go.id/puskesmas	
National policy and regulatory documents	Data on the national requirements for the implementation of Electronic Medical Records (RME), including the obligations, standards, and procedures applicable to health facilities such as Puskesmas.	Ministry of Health of the Republic of Indonesia. (2022). *Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning medical records*. Accessed in August, 2026. https://jdih.kemkes.go.id/pdfjs/web/viewer.html?file=https%3A%2F%2Fjdih.kemkes.go.id%2Fstorage%2Fdocuments%2Fpdfs%2F2022permenkes024.pdf&utm_source	This regulation establishes the central-government policy requirements that form the basis for analysing how digital transformation demands are translated into implementation work at the local and Puskesmas levels in Barru.
Previous study	Data on health information system utilization in Indonesian Puskesmas, digitalization-related administrative burdens, frontline responses to policy implementation tensions, central–local authority relations, and organizational and institutional arrangements shaping policy implementation.	Aisyah, D. N., Setiawan, A. H., Mayadewi, C. A., Lokopessy, A. F., Kozlakidis, Z., & Manikam, L. (2025). Understanding Health Information Systems Utilization Across Public Health Centers in Indonesia: Cross-Sectional Study. *JMIR Medical Informatics*, *13*, e68613–e68613. https://doi.org/10.2196/68613 Bhuiyan, S. A., & Baniamin, H. M. (2025). Intent vs impact: Ramifications of digitalization on the administrative burden. *Public Policy and Administration*. https://doi.org/10.1177/09520767251348541 Bakkeli, V. (2023). Handling Tensions in Frontline Policy Implementation: Legitimating, Interpreting, and Shielding a Disruptive Intervention. *International Journal of Public Administration*, *46*(9), 625–635. https://doi.org/10.1080/01900692.2021.2009856 Safaruddin, S., Andi Muhammad Ishak, I., & Ariyadi, A. (2026). AI-Driven Governance and the Transformation of Central–Local Authority in Indonesia. *Government & Resilience*, *4*(1), 1–21. https://doi.org/10.62503/gr.v4i1.46 Sager, F., & Gofen, A. (2022). The polity of implementation: Organizational and institutional	These studies provide empirical and conceptual bases for interpreting how digital transformation generates implementation demands, redistributes implementation work across governance levels, and requires frontline organizations to adapt to maintain service delivery.

arrangements in policy implementation. *Governance*, *35*(2), 347–364. https://doi.org/10.1111/gove.12677

Source: Data compiled by the authors from official regulatory repositories, government portals, and peer-reviewed literature (2026).

Based on Table 2, various secondary data sources were utilized in this study; therefore, to ensure data suitability, specific inclusion criteria were applied. These criteria encompassed regulations, policies, technical guidelines, government reports, institutional documents, service data, and academic publications related to the digital transformation of healthcare services, policy implementation, the distribution of implementation tasks, and service delivery at the local or Community Health Center (Puskesmas) level in Barru Regency. Selected sources were required to have clear origins and identifiable authorship, be verifiable, and provide information relevant to the study's timeframe and context. Conversely, sources were excluded from the analysis if they lacked traceable origins, could not be verified, fell outside the study period, discussed digital transformation only in general terms without linking it to healthcare services or the local implementation context, or contained information insufficient for tracing policy mandates, implementation tasks, or digital service delivery practices. This selection process was conducted to ensure that all analyzed data were directly relevant to the research focus and could be used to examine the relationships between digital policies, the distribution of implementation tasks, and the responses of frontline organizations.

Data Validation

Data validity in this study was ensured through source triangulation by comparing information from various types of secondary data, including regulations, policies, technical guidelines, government reports, institutional documents, service data, and academic publications. Credibility was reinforced by cross-referencing information on policy and implementation from diverse sources and verifying consistency across time periods and levels of government. Dependability was maintained through systematic documentation of the document identification, selection, collection, and analysis processes, ensuring the traceability of every research stage. Confirmability was strengthened by maintaining a clear audit trail linking document sources, coding processes, analytical categories, and the interpretation of findings; this ensured that conclusions could be traced back to available evidence rather than relying solely on the researcher's interpretation. Meanwhile, transferability was supported by a detailed presentation of the research context, including the characteristics of the digital transformation policy, the local government setting, and the conditions of Community Health Centers (Puskesmas) in Barru Regency, enabling readers to assess the findings' relevance to other local public service contexts sharing similar characteristics.

Data Analysis

Data were analyzed using thematic analysis assisted by NVivo software to identify patterns, relationships, and themes related to digital transformation, the redistribution of implementation work, and resilience governance at the frontline level. All secondary documents that met the inclusion criteria were organized and imported into NVivo for a systematic coding process. The analysis began with open coding of parts of the documents that contained information regarding digital policy demands, service systems and procedures, division of tasks, implementation needs, as well as forms of response at the regional government and health center levels. These codes were then grouped into more conceptual categories and themes based on the three main research concepts. Further analysis was directed at exploring the relationship between the demands of digital

transformation, the work required to implement these policies, the distribution of work between various levels of government, and the forms of adaptation of frontline organizations. NVivo was used to organize documents, trace relationships between codes, compare information between document types and sources, and develop coding matrices to see patterns based on government levels and implementation aspects. The final interpretation was carried out qualitatively by connecting the patterns found in the documents with the context of implementing digital transformation in Barru Regency and the conceptual framework of the research.

Results and Findings

Digital Transformation and Emerging Implementation Demands in Puskesmas Barru

The implementation of digital transformation in Community Health Centers (Puskesmas) in Barru Regency is taking place amidst uneven readiness regarding the use of digital systems. Consequently, this section maps three aspects characterizing this situation: digital systems and service processes, digital infrastructure, and human resources and digital competencies. These three aspects serve to illustrate the forms of digitalization implemented at the service level, the supporting infrastructure, and the human resource capacity available to operate the systems. This mapping is then compared against the implementation requirements inherent in digital transformation to highlight the context in which implementation occurs, followed by an analysis of the distribution of these aspects across government levels and frontline organizations.

Tabel 3. Existing Conditions and Implementation Demands of Digital Transformation in Puskesmas Barru

Aspect	Existing Condition	Implementation Demand	Source
Digital systems and service processes	Digitalization has begun to be implemented in Community Health Center (Puskesmas) services, including online registration and queuing systems at the Mangkoso and Bojo Baru Community Health Centers (Barru Regency Government, 2020)	Community Health Centers (Puskesmas) need to implement Electronic Medical Records and integrate their management into the healthcare service system.	Article 3, paragraph (1) of Minister of Health Regulation No. 24 of 2022 stipulates that every healthcare facility is required to implement an Electronic Medical Record system, and Community Health Centers (Puskesmas) are explicitly included in this requirement. The regulation also mandates that the implementation of medical records be directed toward a digital-based and integrated system (Ministry of Health of the Republic of Indonesia., 2022)
Digital infrastructure	Network availability and digital connectivity are not yet fully uniform across the Barru region (Safaruddin, Andi Muhammad Ishak Ismail, et al., 2026)	Community Health Centers (Puskesmas) need to meet technical requirements to connect their Electronic Medical Record (EMR) systems with SATUSEHAT.	The official SATUSEHAT guidelines state that health service facilities are required to undergo the process to register with and connect to the SATUSEHAT Platform (Ministry of Health of the Republic of Indonesia., 2025a)

Human resources and digital competencies	Data from the Ministry of Health indicates that regarding the Community Health Center (Puskesmas) human resources indicator in Barru, 8 out of 12 centers (66.67%) have not yet met the standard requiring a full complement of 12 types of health personnel. The data also reveals a shortfall of 7 information technology/medical record staff members and 4 finance/administration staff members relative to the established standards (Directorate General of Health Workforce, 2026)	Community health centers (Puskesmas) need to possess the technical capacity or functions to manage the Electronic Medical Record (EMR) system and its integration process.	The SATUSEHAT guidelines explicitly state that if a Community Health Center (Puskesmas) uses an independently developed Electronic Medical Record (EMR) system, the healthcare facility's IT team must register the system and ensure it is verified. For vendor-supplied EMR systems, the healthcare facility must also identify the system in use and keep the system's data updated (Ministry of Health of the Republic of Indonesia, 2025)

Source: Data compiled by the authors from official regulatory documents, government reports, institutional statistics, and local field studies (2026).

Based on Table 3, digital transformation in Community Health Centers (Puskesmas) in Barru Regency has begun to be integrated into service processes, although the readiness of the various stakeholders involved is not yet uniform across service units. The adoption of digital systems requires these centers to align their service processes with new mechanisms, including the use of systems for recording and managing information. At the same time, disparities in connectivity and digital infrastructure create varying implementation environments across regions. Consequently, the introduction of digital systems does not automatically result in identical implementation conditions at every Community Health Center.

Another issue lies in the readiness of human resources. Data from the Ministry of Health indicates that the majority of Community Health Centers (Puskesmas) in Barru do not yet meet staffing standards, particularly regarding personnel specializing in information technology and medical records. This situation places demands for digitalization on organizations with varying levels of supporting capacity. These centers must not only provide services in accordance with established procedures but also possess the capacity to operate and adapt to the use of digital systems within their service processes. Consequently, the interplay of digital system requirements, infrastructure conditions, and human resource capacity creates a less-than-ideal situation: when digital mandates are applied to organizations operating under varying conditions, the task of making the system functional for service delivery extends far beyond the mere provision of technology. This work must be translated into operational practices, managed in accordance with local conditions, and coordinated with actors at other levels of government. The following section therefore focuses on how these demands generate implementation tasks and how that work is distributed among the central government, local governments, and Puskesmas (Community Health Centers) as frontline organizations.

Redistributing Implementation Work: From Digital Policy to Frontline Practice

Digital transformation entails more than simply adopting systems and procedures mandated by higher authorities for implementation at lower levels of government; it requires additional effort to make these systems functional within real-world service delivery contexts. This section analyzes how implementation tasks are distributed among the central government, local governments, and Community Health Centers (Puskesmas) by examining the origins of mandates, the nature of the

resulting work, the actors involved, and the mechanisms for addressing gaps between policy design and local realities. These aspects are used to assess whether digitalization merely distributes tasks administratively or results in a concentration of specific workloads at the local and frontline levels.

Table 4. Distribution of Digital Transformation Implementation Work across Government Levels in Puskesmas Barru

Implementation dimension	Central Government	Local Government (Barru)	Frontliner (Puskesmas in Barru)
Policy and system requirements	The central government has mandated the implementation of Electronic Medical Records (RME) through Minister of Health Regulation No. 24 of 2022. To facilitate digital integration, the Ministry of Health developed SATUSEHAT as a national health data exchange ecosystem (Ministry of Health of the Republic of Indonesia., 2022)	The Barru Regency Government coordinates the delivery of health services through the Health Office, the local government agency responsible for health affairs; including the guidance and development of health service facilities. The Barru Health Office manages a network of 12 Community Health Centers (Puskesmas) that serve as primary health care facilities (Barru Regency Health Office, 2026)	Community Health Centers (Puskesmas) serve as primary care units that translate the demand for digitalization into direct service delivery. In Barru, service digitalization has been implemented through online queuing systems at the Mangkoso and Bojo Baru Community Health Centers, designed to connect with the Barru Regional General Hospital (RSUD) (Barru Regency Government, 2020)
Data standards and management	The Ministry of Health establishes data standards, integration/interoperability standards, verification and validation processes, and data exchange mechanisms via SATUSEHAT. SATUSEHAT also utilizes HL7 FHIR as the data model standard and API for information exchange (Ministry of Health of the Republic of Indonesia, 2026)	The Barru Regency Health Office carries out data recording, updating, coordination, and reporting through official Ministry of Health applications including SIGizi, MPDN, and Pusdatin, following a hierarchical reporting structure. These activities demonstrate that data management requirements from the national system translate into coordination and reporting tasks at the regency level (Barru Regency Health Office, 2026)	Community Health Centers (Puskesmas) form part of the service data production chain, as the services provided at this level generate data that is subsequently used for recording, updating, and reporting processes. In Barru, the network comprises 12 primary care facilities, staffed by over 215 health workers and handling more than 88,000 patient visits during the current fiscal year (Barru Regency Health Office, 2026)
Technical implementation	The central government provides the SATUSEHAT platform, an interoperability mechanism, and technical procedures to connect Electronic Medical Record (RME) systems with the national platform. Healthcare facilities must register and update their RME systems to gain integration	The Barru Regency Government is actively addressing the state of local digital infrastructure. For 2025, the administration has partnered with Telkom to strengthen and expand the internet network, specifically to support healthcare services and reach remote areas (Barru Regency Government, 2025a)	Community Health Centers (Puskesmas) deliver services using the infrastructure available in their respective areas. With 12 centers distributed across the Barru region, connectivity conditions form part of the operational environment in which digital service systems

	access (Ministry of Health of the Republic of Indonesia., 2025b)		operate (Barru Regency Health Office, 2026)
Human-resource adaptation	The SATUSEHAT system requires the involvement of healthcare facilities' IT teams in specific processes, for instance, when a facility utilizes its own independent Electronic Medical Record (EMR) system. The central government provides the procedures and technical requirements that serve as the basis for determining the necessary human resource capabilities at healthcare facilities (Ministry of Health of the Republic of Indonesia, 2025)	The Barru Health Office carries out functions related to the guidance and development of health services and resources through its Health Services and Resources Division. This structure demonstrates that supporting the capacity of health service facilities is part of the local government's responsibilities (Barru Regency Health Office, 2026)	Community Health Centers (Puskesmas) deliver services using their available healthcare workforce. In Barru, there are 12 such centers and over 215 healthcare workers; consequently, digital implementation takes place within service organizations that must simultaneously maintain their daily medical service functions (Barru Regency Health Office, 2026)
Service implementation	The central government has established digitalization and interoperability mechanisms that must be adopted by healthcare facilities. SATUSEHAT is designed to connect the information systems of various healthcare ecosystem members, including healthcare facilities (Ministry of Health of the Republic of Indonesia., 2024b)	The Barru Regency Government coordinates health services through the Health Office and involves Community Health Center (Puskesmas) heads in service management. In 2025, these heads will also be involved in local government agendas regarding service management and the utilization of health resources (Barru Regency Government, 2025b)	Community Health Centers (Puskesmas) serve as the primary points for delivering services to the public. Local evidence indicates that the Mangkoso and Bojo Baru centers have implemented online queuing systems, while the Barru Puskesmas network offers services such as general outpatient care, maternal and child health/family planning (KIA/KB), immunization, laboratory testing, outpatient care, and emergency services. Thus, digital requirements are being integrated alongside the delivery of routine healthcare services (Barru Regency Government, 2020)
Problem resolution and system adjustment	The Ministry of Health provides interoperability guidelines that are explicitly subject to change in line with ecosystem developments, including changes in system functions and components. This demonstrates that the central government not only establishes the system but also develops and adapts its technical standards (Ministry of Health of the Republic of Indonesia., 2024a).	At the local level, the Barru Regency Government is addressing issues that serve as prerequisites for a digital environment, particularly limited connectivity. Internet networks are being strengthened to reach even remote areas in order to support public services, including healthcare (Barru Regency Government, 2025a)	At the frontline level, Community Health Centers (Puskesmas) must continue providing services while digital systems are implemented amidst varying operational conditions across regions. Evidence from Barru indicates that digital implementation has not been uniform: as of 2020, only the Mangkoso and Bojo Baru Community Health Centers were reported to have installed online queuing systems

	(Barru Regency Government, 2020)

Source: Data compiled by the authors from multi-level policy documents, official local health records, and field operational data (2026).

As shown in Table 4, the distribution of tasks for implementing digital transformation in Barru Regency occurs in a tiered manner, with distinct roles at each level of government. The central government plays a key role in establishing standards, regulations, platforms, and technical requirements, specifically through the RME and SATUSEHAT systems. At the local level, these mandates are translated into action through the Health Office's functions regarding coordination, health data management and reporting, and the provision of enabling conditions such as digital connectivity. Meanwhile, Community Health Centers (Puskesmas) serve as the frontline where these mandates are applied in daily service delivery. Thus, the division of labor follows not only the formal allocation of authority but also the specific position of each actor within the implementation chain: the central government sets requirements, local government provides and coordinates support, and Community Health Centers operationalize these mandates in service practice.

In the context of Community Health Centers (Puskesmas) in Barru, which serve on the front lines, the burden of implementation is particularly evident when digital demands intersect with local operational realities. Local government must still strengthen connectivity to support public services, including healthcare, while the adoption of digitalization across Community Health Centers (Puskesmas) remains uneven. Although the use of online queuing systems at the Mangkoso and Bojo Baru centers demonstrates that some units have begun adapting their service processes to digital mechanisms, the existence of 12 centers, each with varying geographical conditions and infrastructure support, indicates that system implementation cannot be assumed to proceed identically across all units. Simultaneously, human resource limitations highlighted by Ministry of Health data place additional pressure on service organizations to operate digital systems alongside routine healthcare functions. These conditions demonstrate that implementation at the Community Health Center level involves more than merely adopting technology; it requires adapting that technology to the available capacity and service conditions.

The situation in Barru Regency illustrates a shift in the implementation burden: moving beyond the mere provision of a system to the task of making that system functional within a local context. While the central government provides the framework and infrastructure at the national level, the system's effectiveness hinges on the local government's ability to address implementation prerequisites and the capacity of Community Health Centers (Puskesmas) to integrate the system into their service delivery. Consequently, achieving a balanced distribution of responsibilities requires more than simply mandating digital compliance for these centers. Successful implementation demands support that directly addresses the root challenges, specifically by strengthening connectivity and technical support at the local level, while simultaneously building human resource capacity within the health centers themselves. In the case of Barru, these findings highlight the need for a governance approach that allocates support and responsibility based on actual implementation conditions, ensuring that health centers do not bear the entire burden of adaptation when national system requirements are applied to diverse local service environments.

Discussion and Research Implication

Digital transformation in Community Health Centers (Puskesmas) in Barru Regency demonstrates that digitalization alters not only service mechanisms but also the distribution of work required to operationalize policies. While standards, systems, and data requirements are established

at higher levels, their implementation demands significant effort and capacity readiness at the local level, specifically from frontline organizations like the Puskesmas. The burden of system operation, data management and verification, workflow adjustments, meeting technical requirements, and maintaining service continuity falls upon these frontline organizations. Consequently, the study reveals a disparity between the formal allocation of authority and the actual distribution of implementation work: the authority to design and mandate systems may reside at the central level, yet the work required to make those systems functional takes place closer to the point of service delivery. In the context of Barru, this shift in workload is particularly significant because digitalization mandates are being implemented amidst uneven levels of connectivity and human resource capacity. Thus, the Puskesmas acts not merely as a recipient of digital policies but as a frontline organization that absorbs and manages the operational demands arising from the application of digital standards within local service environments.

These findings align with literature indicating that digitalization does not automatically eliminate administrative burdens; instead, it can give rise to new forms of work as organizations and users alike must adapt to digital procedures (Abdillah et al., 2025b; Bhuiyan & Baniamin, 2025; Shi & Wang, 2025). Studies on administrative burdens in digital services also indicate that such burdens can arise from learning requirements, the fulfillment of prerequisites, and follow-up actions within digital processes, with their distribution influenced by the access and capacity of the actors involved (Daigneault, 2025; Qadar et al., 2026; Sumardi et al., 2026). This study extends that argument by demonstrating that the burden of implementation falls not only on the public as service users but also on service providers as policy implementers.

In the context of Barru, the mandate to operate digital systems encountered challenges regarding government readiness and capacity, specifically limited infrastructure and human resource constraints, meaning that a portion of the adaptation work had to be absorbed at the Community Health Center (Puskesmas) level. These findings indicate that system-level standardization and integration do not automatically reduce the workload at the implementation stage. Conversely, when a uniform system is applied across service environments with varying capacities, the burden of adjustment often falls upon the actors closest to service delivery. This pattern illustrates how the implementation burden shifts across levels of government. The central government primarily handles the establishment of standards, systems, and integration requirements, while local governments play a role in supporting and coordinating system implementation within their jurisdictions. At the Puskesmas level, these mandates translate into operational tasks that must be performed alongside actual service delivery. Whenever technical needs, connectivity issues, capacity limitations, or the necessity to adjust work processes arise, the Puskesmas becomes the focal point where the gap between policy design and service practice must be managed. Thus, this redistribution of work does not necessarily take the form of a transfer of formal authority, but rather a shift in the operational burden to the actors closest to the service process. The Puskesmas's response to these conditions is a crucial component of digital transformation implementation, as the continuity of service delivery relies on the frontline organization's ability to align work processes with the demands of the deployed systems.

The findings indicate that digital transformation governance needs to factor in implementation work as an integral part of policy design, rather than treating it as a consequence to be addressed only after the system has been deployed. Based on the study's analysis (as illustrated in Figure 2), the necessary strategy focuses on establishing a "frontline implementation architecture" that renders implementation work more visible, distributed, and supported.

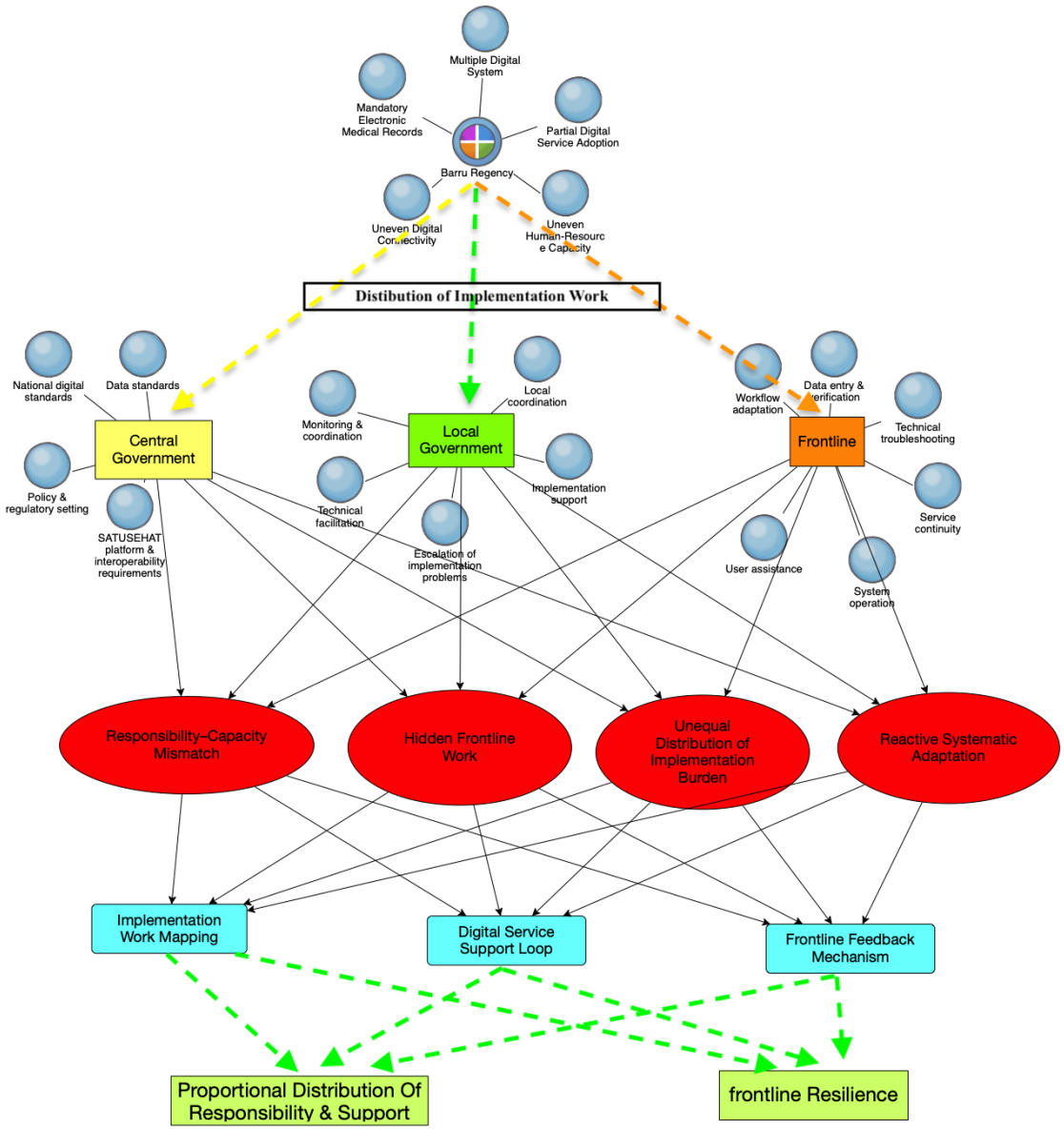


Figure 2. Frontline Implementation Architecture for Health Digital Transformation. Source: Authors using thematic synthesis and qualitative modeling in NVivo (2026).

Based on Figure 2, this model proposes several policy measures to be considered when developing the frontline architecture: First, any new policy or digital system requires a mapping of implementation work starting from the design stage (Kang et al., 2024; Schultes et al., 2022; Warhurst et al., 2025). This mapping needs to identify in detail the tasks required for the system to function, including data entry and verification, synchronization, reporting, user support, troubleshooting, and coordination with technical units, while also designating responsible parties, required resources, and escalation mechanisms for situations exceeding the capacity of the Community Health Center (Puskesmas). In the context of Barru Regency, this mechanism is crucial because digital requirements are being implemented amidst infrastructure conditions and human resource capacities that are not yet fully uniform.

Second, local governments need to establish a digital service support loop that connects Community Health Centers (Puskesmas) with regional technical units and digital system

administrators. This mechanism functions not merely as a means of assistance during disruptions, but as a comprehensive support cycle encompassing reporting, issue classification, the assignment of responsible parties, resolution, and documentation for the purpose of system improvement (Aisyah et al., 2025; Putri et al., 2026). Issues resolvable at the Community Health Center (Puskesmas) level can be handled locally, whereas problems concerning connectivity, interoperability, system configuration, or platform disruptions need to be escalated to units with the appropriate capacity and authority via this service support loop mechanism. In this way, local governments serve as an active coordination layer that prevents recurring issues from becoming a persistent burden on frontline staff.

Third, a frontline feedback mechanism is needed to provide a formal avenue for Community Health Centers (Puskesmas) to communicate their workload (Mergel et al., 2019; Morrison, 2015), system misalignment with service workflows, user difficulties, recurring technical issues, and resource limitations that arise during implementation. Such feedback must be integrated into system evaluations and adjustments so that frontline experiences do not merely remain operational complaints but instead serve as a source of learning for policy and technology improvements.

These three strategies form a cycle, spanning initial mapping and support to learning, wherein implementation work mapping determines task allocation, the digital service support loop ensures assistance when frontline capacity is insufficient, and the frontline feedback mechanism links implementation experiences to subsequent system changes. This approach shifts digital transformation governance from merely requiring Community Health Centers (Puskesmas) to adapt, toward establishing conditions that enable adaptation to occur proportionately. The study's novelty lies in positioning the distribution of implementation tasks as an integral part of digital transformation governance design, demonstrating that Puskesmas resilience is determined not solely by frontline adaptive capacity, but also by how work, support, and learning mechanisms are distributed across levels of government.

Theoretical and Practical Implications

Theoretically, this study bridges the perspectives of digital transformation and resilience governance by focusing on the distribution of implementation-related work. While digital transformation literature typically emphasizes readiness, adoption, integration, and service outcomes, resilience governance studies tend to focus on organizational capacity to adapt to change and disruption. This research demonstrates that a key source of adaptive demands on frontline organizations stems from the changes in and redistribution of work accompanying digital implementation. Consequently, the study's contribution lies not in claiming that digitalization invariably enhances or diminishes service performance, but in explaining how centrally designed digital policies generate implementation work at the local level, and how Community Health Centers (Puskesmas) maintain service continuity by responding to and absorbing that workload.

In practical terms, this implies that support for digital transformation in Community Health Centers must be tailored to the actual work arising during implementation, rather than merely addressing the need for system-usage training. Central and local governments need to consider human resource requirements, technical support, infrastructure, the division of responsibilities, and feedback mechanisms from the system design stage onwards. Thus, resilience in Community Health Centers should not be built by continuously increasing the frontline's capacity to absorb additional work, but by establishing a more proportional distribution of responsibilities and support among the various actors involved in the digital transformation.

Conclusions and Limitation

Conclusions

Digital transformation in Community Health Centers (Puskesmas) in Barru Regency demonstrates that the implementation of digital systems not only alters service mechanisms but also redistributes implementation tasks across various levels of government. While standards and systems are established at higher levels, the work of operating, adapting, verifying data, troubleshooting technical issues, and providing user support largely takes place at the local government and Puskesmas levels. Puskesmas subsequently develop various forms of adaptation to maintain service continuity, illustrating that resilience emerges from the capacity of frontline organizations to manage implementation demands as they arise in practice. These findings situate the research at the intersection of digital transformation, the redistribution of implementation work, and resilience governance. They offer the perspective that the success of digital transformation cannot be measured solely by technology adoption or system efficiency, but also by how the work required to make these systems functional is distributed and supported throughout the governance chain. The study highlights an implementation dimension often overlooked in digitalization agendas: the frontline work that enables digital policies to be translated into services that remain operational within local contexts.

Limitations and Future Research Directions

This study has several limitations that should be considered when interpreting the findings. Conducted at Community Health Centers (Puskesmas) in a single regency, the study's findings regarding the redistribution of implementation work cannot be generalized to the entire regional healthcare service context in Indonesia. Furthermore, the study employed a qualitative approach focusing on experiences and implementation practices; consequently, it did not quantitatively measure changes in workload or compare the volume of work across central government, local government, and Community Health Centers.

Future research could expand the scope through a comparative multi-site study involving Community Health Centers with varying infrastructure and regional capacities to identify patterns of work redistribution that are either consistent or context-specific. Subsequent studies could also develop indicators or measurement methods for "implementation work" to estimate the time, frequency, and resources allocated to digital tasks at each level of government. A longitudinal approach is also warranted to determine whether the additional work emerging during the initial stages of digital transformation diminishes as the system matures or becomes a permanent component of frontline work. Thus, future research can further examine the relationships among digital transformation, the redistribution of implementation work, and frontline resilience, not only through the experiences of the actors involved but also through measurement and cross-contextual comparison.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Use of Artificial Intelligence (AI)-Assisted Technology

The authors declare that no artificial intelligence (AI) tools were used in the preparation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

References

Abdelhakim, M., Abdeldayem, M. M., & Aldulaimi, S. H. (2022). Information technology adoption barriers in public sector. In *2022 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)* (pp. 355–360). IEEE. https://doi.org/10.1109/ICETSIS55481.2022.9888805

Abdillah, A., Widianingsih, I., Buchari, R. A., & Nurasa, H. (2025a). Resilience governance: A concepts analysis and research synthesis. *Discover Environment*, *3*(1), Article 50. https://doi.org/10.1007/s44274-025-00229-3

Abdillah, A., Widianingsih, I., Buchari, R. A., & Nurasa, H. (2025b). Using big data methods in Bandung city planning research: Urban resilient governance with smart city. *Government & Resilience*, *3*(1), 52–62. https://doi.org/10.62503/gr.v3i1.24

Aisyah, D. N., Setiawan, A. H., Mayadewi, C. A., Lokopessy, A. F., Kozlakidis, Z., & Manikam, L. (2025). Understanding health information systems utilization across public health centers in Indonesia: Cross-sectional study. *JMIR Medical Informatics*, *13*, Article e68613. https://doi.org/10.2196/68613

Alia, M. A., & Jaradat, Y. (2025). The foundations and infrastructure required for digital transformation in the Jordanian public sector. In *2025 10th International Conference on Computer Science and Engineering (UBMK)* (pp. 1432–1437). IEEE. https://doi.org/10.1109/UBMK67458.2025.11206918

Alshawaaf, N., & Alzougool, B. (2025a). Assessing digital transformation success in Kuwaiti government services. *Administrative Sciences*, *15*(12), Article 498. https://doi.org/10.3390/admsci15120498

Alshawaaf, N., & Alzougool, B. (2025b). Developing a theoretical framework for measuring digital transformation of government services in Kuwait. In S. Malik, A. Alkhaldi, R. Alhaimer, M. Lytras, A. Salamzadeh, & H. Alrashidi (Eds.), *Civic synergy: Leading and managing the evolution of smart cities* (pp. 21–34). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83708-042-720251002

Androniceanu, A. (2023). The new trends of digital transformation and artificial intelligence in public administration. *Administratie si Management Public*, *40*, 147–155. https://doi.org/10.24818/amp/2023.40-09

Bakkeli, V. (2023). Handling tensions in frontline policy implementation: Legitimating, interpreting, and shielding a disruptive intervention. *International Journal of Public Administration*, *46*(9), 625–635. https://doi.org/10.1080/01900692.2021.2009856

Barru Regency Government. (2020). *BPJS Health states that health center service registration in Barru will be conducted online*. https://barrukab.go.id/pihak-bpjs-kesehatan-sebut-pendaftaran-layanan-puskesmas-di-barru-bakal-online/

Barru Regency Government. (2024). *Strengthening digital access, the Regent of Barru inaugurates 4G network in Tanete Riaja*. https://barrukab.go.id/perkuat-akses-digital-bupati-barru-resmikan-jaringan-4g-di-tanete-riaja/

Barru Regency Government. (2025a). *Accelerating digital transformation, Barru Regency Government establishes strategic cooperation with Telkom to strengthen internet connectivity*. https://barrukab.go.id/percepat-transformasi-digital-pemkab-barru-jalin-kerja-sama-strategis-dengan-telkom-perkuat-jaringan-internet/

Barru Regency Government. (2025b). *Barru Regency Government promotes the optimization of local revenue through improvements in property tax, markets, and health services*. https://barrukab.go.id/pemkab-barru-dorong-optimalisasi-pad-lewat-pembenahan-pbb-pasar-dan-layanan-kesehatan/

Barru Regency Health Office. (2026). *Community health centers (Puskesmas)*. https://dinkes.barrukab.go.id/puskesmas

Bhuiyan, S. A., & Baniamin, H. M. (2025). Intent vs impact: Ramifications of digitalization on the administrative burden. *Public Policy and Administration*. Advance online publication. https://doi.org/10.1177/09520767251348541

Bravo Rojas, L. M., Arenas Ñiquin, J. L., Castillo Luque, F. E., & Diaz García, M. F. (2024). Estrategias de transformación digital en entornos gubernamentales. *Revista Venezolana de Gerencia*, *29*(107), 1285–1299. https://doi.org/10.52080/rvgluz.29.107.20

Casalino, N., Armenia, S., & Di Nauta, P. (2021). Inspiring the organizational change and accelerating the digital transition in public sector by systems thinking and system dynamics approaches. In V. D. Uskov, R. J. Howlett, & R. K. Jain (Eds.), *Smart education and e-learning 2021* (Smart Innovation, Systems and Technologies, Vol. 240, pp. 197–214). Springer Singapore. https://doi.org/10.1007/978-981-16-2834-4_17

Daigneault, P.-M. (2025). Administrative burden revisited: Advancing research and practice. *Canadian Public Administration*, *68*(1), 159–172. https://doi.org/10.1111/capa.70000

Daßler, L., Hein, A., & Krcmar, H. (2024). Innovating public services: Drivers and challenges of innovation labs in the co-production of e-government services. In *Proceedings of the 25th Annual International Conference on Digital Government Research* (pp. 711–720). Association for Computing Machinery. https://doi.org/10.1145/3657054.3657138

Directorate General of Health Workforce, Ministry of Health of the Republic of Indonesia. (2026). *Percentage of health centers with health workforce meeting the required standards: Barru Regency, South Sulawesi*. https://eplanning-ditjennakes.kemkes.go.id/indikator/user/persentase_terpenuhi/SKMPKM/prov/73/kab/7311

Dumitrescu, C. (2025). Opportunities of digital transformation in local autonomy: Successful examples and learnings. In C.-S. Săraru & C. E. Popa Tache (Eds.), *AI, sustainability and solidarity in advancing European values in a globalized age* (pp. 187–200). Springer Nature Switzerland. https://doi.org/10.1007/978-3-032-06508-7_13

Eren, V., & Duman, H. (2025). The impact of digital technologies on public administration. In *Modernizing public administration with new digital advancements* (pp. 35–64). IGI Global. https://doi.org/10.4018/979-8-3373-1484-6.ch002

Geada, N. (2021). Change management in digital transformation. In *Reviving businesses with new organizational change management strategies* (pp. 251–260). IGI Global. https://doi.org/10.4018/978-1-7998-7452-2.ch014

Georgiou, G. A. (2024). Building resilience in the public sector through risk assessment, activity-based budgeting and performance audit. In *The role of the public sector in building social and economic resilience* (pp. 105–117). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-67702-1_6

Güler, M., & Büyüközkan, G. (2023). A survey of digital government: Science mapping approach, application areas, and future directions. *Systems*, *11*(12), Article 563. https://doi.org/10.3390/systems11120563

Health Development Policy Agency. (2024). *Policy brief–implementation research 2024*. Ministry of Health of the Republic of Indonesia. https://www.badankebijakan.kemkes.go.id/policy-brief-ir-2024/

International Telecommunication Union. (2024). *Facts and figures 2024: Internet use*. https://www.itu.int/itu-d/reports/statistics/2024/11/10/ff24-internet-use/

Kang, E., ten Hoor, G., Craig, D. W., Rodriguez, S., Stockton, J., & Fernandez, M. E. (2024). Context, mechanisms and community engagement in implementation strategies: A systematic review protocol of implementation strategies designed using implementation mapping. *BMJ Open*, *14*(11), Article e088359. https://doi.org/10.1136/bmjopen-2024-088359

Khamiliyah, L., Rahayu, A., Dirgantari, P. D., Wibowo, L. A., & Susanto, E. (2025). Digitalization of government organizations: An empirical study of strategic factors of H.R. resources. *Cogent Business & Management*, *12*(1), Article 2457442. https://doi.org/10.1080/23311975.2025.2457442

Kumaraswamy, T. R., Choudhury, M., Ponappa, S., & Majumdar, S. (2025). A significance of climate resilience: Strategies for local, regional, and national levels. In *Sustainable synergy: Harnessing ecosystems for climate resilience* (pp. 193–205). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-77957-2_13

Kurniawan, C., Pribadi, U., & Iqbal, M. (2023). The role of e-governance in improving local governments performance (Case study: Sumbawa Regency). *Jurnal Ilmiah Peuradeun*, *11*(3), 1139–1154. https://doi.org/10.26811/peuradeun.v11i3.795

Li, J., Tang, S.-Y., & Wen, B. (2026). Unpacking resilience in public administration: Insights from a meta-narrative review. *Public Administration Review*, *86*(5), 1235–1254. https://doi.org/10.1111/puar.70083

Litchfield, I., Gale, N., Burrows, M., & Greenfield, S. (2023). "You're only a receptionist, what do you want to know for?": Street-level bureaucracy on the front line of primary care in the United Kingdom. *Heliyon*, *9*(11), Article e21298. https://doi.org/10.1016/j.heliyon.2023.e21298

Lolich, L., & Timonen, V. (2022). Digitalisation of public services as a challenge to social justice. In *Solidarity and social justice in contemporary societies* (pp. 191–200). Springer International Publishing. https://doi.org/10.1007/978-3-030-93795-9_18

Lutz, G., & Schutte, F. (2025). Enhancing resilience in public sector business continuity: Lessons from the Western Cape Government, South Africa. *International Journal of Business Continuity and Risk Management*, *15*(5), 1–25. https://doi.org/10.1504/IJBCRM.2025.149032

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, *36*(4), Article 101385. https://doi.org/10.1016/j.giq.2019.06.002

Ministry of Health of the Republic of Indonesia. (2022). *Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning medical records*. https://jdih.kemkes.go.id/storage/documents/pdfs/2022permenkes024.pdf

Ministry of Health of the Republic of Indonesia. (2024a). *Interoperability*. SATUSEHAT Platform. https://satusehat.kemkes.go.id/platform/docs/id/interoperability/

Ministry of Health of the Republic of Indonesia. (2024b). *What is SATUSEHAT?* SATUSEHAT Platform. https://satusehat.kemkes.go.id/platform/docs/id/playbook/introduction/

Ministry of Health of the Republic of Indonesia. (2025a). *Health facilities*. SATUSEHAT Platform. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/regis-institution/

Ministry of Health of the Republic of Indonesia. (2025b). *Registration guide*. SATUSEHAT Platform. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/

Ministry of Health of the Republic of Indonesia. (2025c). *Select the medical record system (RME)*. SATUSEHAT Platform. https://satusehat.kemkes.go.id/platform/docs/id/registration-guide/regis-institution/select-system-rme/

Ministry of Health of the Republic of Indonesia. (2026). *Terms and privacy*. SATUSEHAT Data. https://satusehat.kemkes.go.id/data/terms-and-privacy

Morrison, B. (2015). The problem with workarounds is that they work: The persistence of resource shortages. *Journal of Operations Management*, *39–40*(1), 79–91. https://doi.org/10.1016/j.jom.2015.07.008

O'Toole, L. J., & Montjoy, R. S. (1984). Interorganizational policy implementation: A theoretical perspective. *Public Administration Review*, *44*(6), 491–503. https://doi.org/10.2307/3110411

Pham, Q. H., & Vu, K. P. (2025). Management accounting control system and risk governance in public sector organizational resilience enhancement. *Cogent Social Sciences*, *11*(1), Article 2444473. https://doi.org/10.1080/23311886.2024.2444473

Prastio, L. O., & Masania, Y. (2026). Public service innovation in handling cases of violent bullying in Serang City in 2024. *Sustainable Future Reports*, *1*(1), 18–29. https://doi.org/10.62503/sfr.1.1.18-29

Putri Nugraha, N., Wahid, N., & Rusliadi. (2026). Advancing sustainable mobility: Implementation of Electronic Traffic Law Enforcement (ETLE) for traffic compliance in Makassar City. *Sustainable Future Reports*, *1*(1), 41–54. https://doi.org/10.62503/sfr.1.1.41-54

Putri, S. S., Kurniawati, A., & Arini, I. Y. (2026). Designing a management information system for health and pharmaceutical service at UPT Puskesmas XYZ using the Rapid Application Development (RAD) method. In *2026 International Conference on Enterprise and Industrial System (ICOEINS)* (pp. 1–6). IEEE. https://doi.org/10.1109/ICOEINS69996.2026.11605838

Qadar, J., Herlina, B., Zulfachri, Z., & Marzuki, S. (2026). Building bureaucratic capacity for improved public service quality in Makassar City, Indonesia. *Government & Resilience*, *4*(1), 45–65. https://doi.org/10.62503/gr.v4i1.48

Safaruddin, Ismail, A. M. I., & Masyitah. (2026). Inovasi pelayanan publik berbasis teknologi digital: Studi kasus implementasi e-government di Kabupaten Barru. *PENA BANGSA: Bisnis dan Tata Kelola Publik Adaptif*, *2*(1), 149–166. https://doi.org/10.69616/pb.v2i1.594

Safaruddin, S., Andi Muhammad Ishak, I., & Ariyadi, A. (2026). AI-driven governance and the transformation of central–local authority in Indonesia. *Government & Resilience*, *4*(1), 1–21. https://doi.org/10.62503/gr.v4i1.46

Sager, F., & Gofen, A. (2022). The polity of implementation: Organizational and institutional arrangements in policy implementation. *Governance*, *35*(2), 347–364. https://doi.org/10.1111/gove.12677

Schultes, M.-T., Albers, B., Caci, L., Nyantakyi, E., & Clack, L. (2022). A modified implementation mapping methodology for evaluating and learning from existing implementation. *Frontiers in Public Health*, *10*, Article 836552. https://doi.org/10.3389/fpubh.2022.836552

Shi, G., & Wang, G. (2025). Administrative burden reduction in Chinese digital government: Are bureaucratic training and platform optimization effective? *Chinese Political Science Review*, *10*(2), 204–223. https://doi.org/10.1007/s41111-025-00277-3

Sumardi, S., Gani, K., Anirwan, A., Nasir, N., & Halim, A. (2026). The effect of bureaucratic digitalization on administrative burdens and access to public services among marginalized communities in Makassar City. *Natapraja*, *14*(1), 160–173. https://doi.org/10.21831/natapraja.v14i1.94604

Umarova, A. (2025). Achieving inter-governmental performance on strategic priorities in the delivery of public services. In *Public administration in the new reality* (pp. 125–147). Springer Nature Singapore. https://doi.org/10.1007/978-981-96-3845-1_5

Warhurst, K., Tyack, Z., Beckmann, M., & Abell, B. (2025). The use of implementation mapping in healthcare settings: A scoping review. *Frontiers in Public Health*, *13*, Article 1603178. https://doi.org/10.3389/fpubh.2025.1603178

Author's Bio*

Andi Muhammad Ishak Ismail, Public Administration, Institut Teknologi Bisnis dan Administrasi Al Gazali Barru, Indonesia, Field of Scientific Expertise: Public Administration, Email: anchaliccha19@gmail.com, and Orcid: https://orcid.org/0009-0008-3437-9780.

Safaruddin, Public Administration, Institut Teknologi Bisnis dan Administrasi Al Gazali Barru, Indonesia, Field of Scientific Expertise: Public Administration and Public Policy, Email: safaruddin0492@gmail.com, and Orcid: https://orcid.org/0000-0002-1935-7371.

Ishaq Yunus (IY) is an employee of the Central Mamuju Regency Government, West Sulawesi, Indonesia. He is a researcher in public policy and organizational management. Email: ishaqyunus2019@gmail.com; ORCID: -.