



2025 ANPOR-APCA Annual Conference
November 4-7, Southeast Bangkok University, Bangkok & Amari Hotel, Pattaya, THAILAND

EMPOWERING HEALTH ADMINISTRATION: LOCAL GOVERNMENT POLICY PERSPECTIVES IN THE DIGITAL TRANSFORMATION ERA

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ABSTRACT

Background: The decentralization of health administration has delegated responsibilities to district-level authorities, leading to diverse digital transformations across various regions in West Nusa Tenggara Province, Indonesia. Challenges related to standardizing procedures, infrastructure, and policy impede the effective delivery of services. This study examines how decentralized systems utilize adaptive strategies to enhance efficiency.

Methods: This research employs a qualitative approach to investigate the technical and organizational aspects of digital health platforms. Participants were chosen through purposive sampling. Data collection comprised interviews, focus group sessions, and observational activities. NVivo 14 was utilized for dual-coded analysis with triangulation, ensuring ethical compliance.

Results: A thematic analysis has identified deficiencies in the West Nusa Tenggara Province, where digital health policies have been implemented in 64% (7 out of 11 districts), and the Indonesia OneHealth platform has been utilized by 53% (5 districts) of the districts.

The finding highlights significant institutional and infrastructural inadequacies, particularly in governance coordination and technological readiness.

Conclusions: Technology plays a transformative role in digital health management. Teams integrate feedback mechanisms while management monitors key indicators. Privacy requires robust identity management. The framework evaluates digital health performance while ensuring the protection of privacy.

Originality: This study examines the digital transformation and local governance within the health administration system in a region that has been under-explored academically.

Plain language summary: In West Nusa Tenggara, 64% of districts have implemented digital policies, while 53% have adopted the One Health strategy for infrastructure development.

Keywords: Empower Health Administration, Government policy, Onehealth Platform



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INTRODUCTION

The field of health administration faces substantial challenges due to rapid digital transformation. Technologies such as electronic medical records, mobile applications, and artificial intelligence have revolutionized the healthcare industry. The success of this transformation depends on the readiness of infrastructure, human resources, regulatory frameworks, and local government policies. In Indonesia, local governments influence health service management at provincial and district levels, affecting technology acquisition, workforce training, and information system integration. Their capacity to address digitalization is crucial for the efficiency of the health system. Many regions face inadequate digital infrastructure and a shortage of skilled personnel. The disparity between developed and less-developed areas could exacerbate health service inequalities, affecting access to technology and policy-making. As noted by Tian et al. (2025), digital tools can extend health services to remote areas by utilizing telemedicine. Despite challenges, digital transformation offers opportunities to enhance health administration through automation and improved decision-making.

Local government policies are shaped by regional characteristics, necessitating tailored approaches for both urban and rural areas. Policy strategies must be data-driven to enable digital transformation. Local authorities need policies that are aligned with technology while addressing the needs of vulnerable populations. A research gap exists in the digitalization policies of local governments for health administration. The dynamics of local policies are crucial for strategic development. This study examined regional policies and challenges in digital transformation. The digitalization of health services risks marginalizing individuals who lack digital access or the necessary skills. Social equity is fundamental to the digital transformation of healthcare administration. Local governments must ensure that technology is accessible to all, not just those who are digitally proficient. Stakeholder collaboration necessitates partnerships among the private sector, civil society, academia, and local communities. The private sector provides technological systems, while academia offers training support. Collaborative strategies enhance digital health services (Evgeny et al., 2024; Nasirin et al., 2023), requiring adaptation through policy evaluations. Sustainability must be integrated into the policy formulation process.

Policy strategies identify emerging issues and determine best practices, providing theoretical and practical recommendations for Indonesia. According to Grøn and Møller (2024), digital transformation in health administration involves governance, social justice, and cultural evolution of services. Technology alters work tools, mindsets, and structures. Local governments must foster innovation within the confines of bureaucratic limits. Digital transformation can create inequality without policies supporting less-empowered groups. Individuals with lower levels of education and those living in remote areas are at risk of exclusion as healthcare transitions online. Success requires system integration and inclusivity to prevent marginalization (Giest & Roberge, 2024). Digitalization enhances financing through automation, though it requires investment in hardware, training, and maintenance. Policies must consider long-term planning. System interoperability remains challenging, as regions' customized systems lack national



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standards. Local governments should focus on standardizing and working with national organizations to enhance connectivity.

In the field of public health administration, digital transformation faces resistance from civil servants who must develop new skills and adapt to increased transparency and accountability. Successfully implementing digital strategies requires managing change by considering the policy framework and stakeholder psychology. As Brunetti et al. (2020) note, digitalization often fails due to misunderstandings and unsuitable solutions. Policy design should begin with a thorough needs assessment and involve key stakeholders. Local governments face difficulties with digital innovations due to regulatory uncertainties. To align policies, existing regulations must be updated. Local governments require indicators to evaluate the digitalization of their health administration. Technologies such as big data, IoT, and artificial intelligence can enhance healthcare services. Healthcare administration faces challenges in digital transformation, including the implementation of electronic records, mobile health applications, and the integration of AI in clinical decision-making (Alzghaibi, 2025).

Disparities in technological access and data-driven policy disparities persist between developed and less-developed regions. Digital transformation enhances automation, efficiency, and data-driven decisions, expanding services via telemedicine and online platforms. Policies must be contextual and data-driven to include marginalized groups. Studies examine the digitalization of local government in health administration. Understanding policy dynamics is essential for sustainable strategies. This study analyzes regional strategy and digital transformation successes. Without universal access, digitalization may exclude individuals lacking internet or online tool familiarity. Social justice must be central to ensure that technologies are accessible and equitable. Collaboration among stakeholders is crucial for the digital transformation of health services. Local governments should partner with the private sector, civil society, academia, and communities. These partnerships develop sustainable solutions, with the private sector providing systems and academia offering training and expertise. Lee et al. (2021) emphasize the importance of monitoring both technical and socioeconomic impacts, as well as utilizing blockchain for data protection.

Regional digital queuing and monitoring systems have proven advantageous when tailored to local contexts. Successful digital transformation requires robust institutions, skilled personnel, funding, and effective collaboration to enhance public health outcomes. This study highlights the importance of aligning national digital platforms with district needs for fair policy-making. Platform usage differences across districts underline the need for regulations that integrate digital tools with existing policies. Issues such as digital literacy, data quality, and internet access impact service delivery. The goal was to develop a framework merging national guidelines with local needs by examining platform usage and identifying aligned regulations. We suggest strategies for digital transformation. This study is crucial for health management in Indonesia and provides evidence for sustainable digital planning. It contributes to discussions on collaborative digital health transformations using technical,



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administrative, and social indicators. These findings demonstrate how to strike a balance between standardization and local innovation to enhance services.

METHODS

This study employed a qualitative approach to investigate the technical and organizational management of digital health platforms within a decentralized system. Participants were selected through stratified purposive sampling to ensure representation in terms of digital readiness, financial capabilities, urban-rural distribution, and governance models. Data were collected through semi-structured interviews, focus groups, and reviews of regulations, budgets, contracts, procedures, and monitoring reports, as well as non-participant observation. Study tools were piloted and refined, with teams trained in research ethics and data security. NVivo 14 facilitated analysis using a thematic framework with a living codebook, dual coding, and adjudication for consistency. Woolf and Silver (2017) noted the integration of NVivo through the use of codes, cases, queries, tables, and charts. Case classifications organized metadata, while matrix queries and framework matrices facilitated comparisons among stakeholders and districts; word-frequency and cluster analyses revealed discursive patterns. Study credibility was enhanced through data triangulation, audit trails, reflexive memos, peer debriefing, and member checking. Ethical protocols covered research ethics, health authority approval, informed consent, pseudonymization, encrypted storage, role-based access, and data-sharing agreements. Reporting ensured anonymity, included community engagement, and enhanced transparency by archiving de-identified instruments and codebooks, subject to confidentiality.

RESULTS

Platform Adoption Patterns

In Mataram City, the primary healthcare framework comprises 11 public health centers providing inpatient and outpatient care. The number of hospitals increased from 14 to 16 between 2022 and 2024, all of which are accredited facilities equipped for digital platforms. The Integrated Primary Care initiative enhances data quality and governance, while Mataram supports platform interoperability. The OneHealth platform implementation demonstrates integration with the national ecosystem. Hospitals in Mataram City derive strengths from their capacity and readiness for quality. Public healthcare, private clinics, and specialized hospitals provide comprehensive referral services for general and specialty needs. Hospital accreditation ensures the quality and safety of patient care. The combination of public healthcare and private management enables flexible financing and service delivery. As the provincial referral hub, Mataram connects different healthcare levels. These strengths prepare hospitals for digital systems and health-data interoperability.



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Hospitals in Mataram City offer key advantages over others in West Nusa Tenggara due to their superior facilities, services, and quality standards. While most areas have few general hospitals with limited offerings, Mataram has evolved into a referral healthcare center, featuring public, private, educational, police, and specialized institutions, including those offering ophthalmology and psychiatry services. This diversity addresses general and subspecialist healthcare needs. All Mataram hospitals are accredited, boasting robust digital infrastructure, which makes the city West Nusa Tenggara's connectivity hub and the most prepared for national digital health systems. These strengths position it as a provincial healthcare model, referral point for neighboring districts, and leader in digital health transformation. A comparison between hospitals and community healthcare is presented below.

Table 1

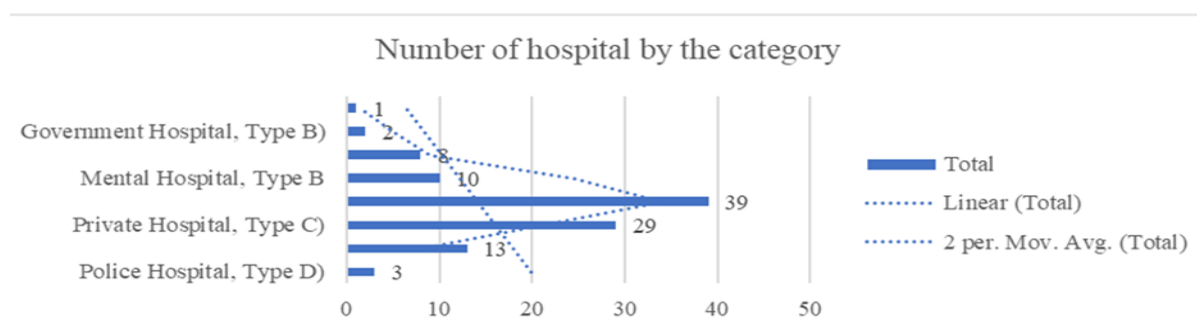
Comparison of the Number of Hospitals and Community Health Centers

Year	Number of Hospitals	Number of Public Health Centres
2022	14	11
2023	15	11
2024	16	11

As shown in Table 1, the number of hospitals increased over the three years. By 2022, there were 14 hospitals, with one more added in 2023, resulting in a total of 16 by 2024. This growth represents a 14.3% increase over two years, with a 6.9% CAGR. The increase reported by Bartlett et al. (2023) is attributed to initiatives aimed at enhancing healthcare capacity and expanding referral networks (Table 1). This infrastructure growth aligns with enhanced system preparedness and improved patient safety. Addo & Agyepong (2024) emphasized the importance of investing in human resources, digital health technologies, and financial sustainability. Physical expansion can enhance the performance of healthcare systems. The list of hospitals is as follows.

Figure 1

Listing of hospitals by category





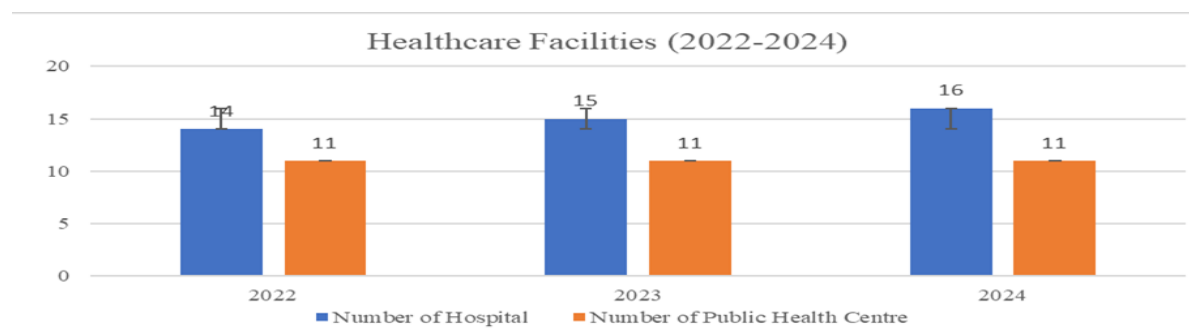
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Figure 1 illustrates the categorization of hospitals based on type and ownership. There are thirteen educational hospitals (Type C/ Intermediate-accredited) dedicated to healthcare and medical training. Hudon et al. (2022) noted that this structure facilitates the transition from basic to complex cases and enhances referral management. Private hospitals, classified as Types C and D, were the most prevalent, with 29 and 39 units, respectively. Mental hospitals (Type B) consisted of 10 psychiatric units, while there were eight specialized eye hospitals (Type C). Two provincial general hospitals (Type B) function as provincial referral hubs, and one municipal general hospital (Type B) serves as the primary referral center for the city. In 2022, Mataram City's referral network comprised 14 hospitals, with municipal and provincial hospitals handling secondary and tertiary referrals, educational hospitals supporting service delivery, and private hospitals augmenting their capacity. Specialized ophthalmology and psychiatric hospitals offer subspecialty care. Hospital accreditation has enhanced quality standards and patient safety. By 2024, the number of hospitals is expected to increase to 16, thereby expanding referral capacity while maintaining high standards. Major hospitals have demonstrated interoperability through national ecosystem connections, thereby enhancing clinical data integration (Lewis et al., 2022). Community health centers remain at 11 units from 2022 to 2024, ensuring consistent primary care services and supporting the adoption of digital platforms.

A health facility analysis in Mataram City revealed that the number of hospitals increased from 14 to 16, representing a 14.3% rise with a 6.9% compound annual growth rate (CAGR). These figures indicate that referral services experienced a 7% yearly growth rate. All hospitals were accredited and showed improved quality, patient safety, governance (including clinical pathways, incident reporting, and audit cycles), and digital health readiness (Hussein et al., 2021). Eleven community health centers (CHCs) remained stable, maintaining primary care coverage and supporting Integrated Primary Care (IPC). This stability enhances referral efficiency and aligns with national digital platforms, such as OneHealth. The combination of accredited hospitals and CHCs follows a quality-first scaling approach, improving outcomes across service tiers. For details on the healthcare facilities, refer to Table 2.

Table 2

Number of Healthcare Facilities





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The Table shows trends in healthcare facilities in Mataram City from 2022 to 2024. Hospitals increased from 14 in 2022 to 15 in 2023 and 16 in 2024, while CHCs remained stable at 11, indicating consistent primary care services. As Kelsey et al. (2023) note, this combination highlights Mataram's strategy of strengthening its referral system while maintaining primary health services, as shown in Table 2. This balance is crucial for readiness in digital health transformation. The growth in hospital capacity, with steady CHCs, represents balanced health system development. According to Ladds et al. (2023), this combination supports efficient hospital utilization through case filtering and expands treatment capacity. Mataram is increasing service capacity and aligning infrastructure with digital integration goals, enabling data sharing between hospitals and CHCs. The city serves as a regional benchmark in West Nusa Tenggara Province, showing readiness for national health digitalization initiatives.

Factors Influencing Implementation

Three supportive factors and two challenges influenced the city's implementation. The presence of 16 hospitals improves referral systems and data consolidation. An increase from 14 to 16 hospitals between 2022 and 2024 enhances network adoption. Eleven community health centers supported citywide standardization under the Integrated Primary Care (ILP) model, leading to consistent workflow. The absence of connectivity "blank spots" ensures stable data access. Challenges arise from varying facility readiness and diverse information systems. Ten of 11 community health centers met all nine standard staffing categories (91%), leaving one center in need of support, which limited the adoption of the frontline module. Information systems across hospitals remain diverse, without a comprehensive account of active sites in the national interoperability stack. These conditions require integration oversight, adherence to interoperability profiles, and vendor agreements regarding interface stability and data quality.

Healthcare Infrastructure and Primary Care Capacity

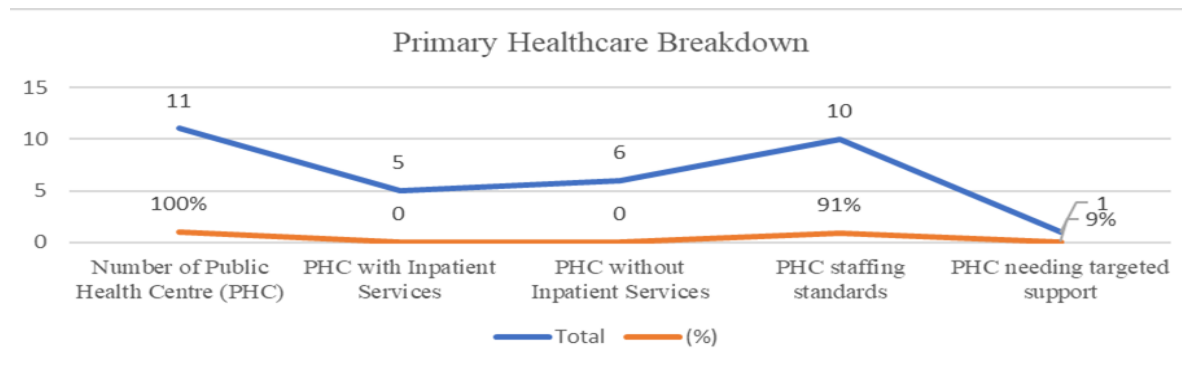
Figure 2 illustrates that 11 community health centers support primary health services in Mataram City. Among them, 45.5% provided inpatient services, while 54.5% focused on outpatient, promotive, and preventive care. According to Daniel et al. (2021), this distribution facilitates functional differentiation and reduces hospital referrals, as shown in Figure 2. Regarding workforce readiness, 91% of the health centers met all nine national staffing standards, including general practitioners, dentists, nurses, midwives, nutritionists, public health officers, environmental health officers, laboratory analysts, and pharmacists, indicating strong preparedness for digital adoption. However, one health center (9%) did not fulfill all staffing standards. Although primary health services are well-established, interventions are needed to ensure uniform capacity across centers to support Integrated Primary Care and integration into the national digital health ecosystem.



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Figure 2

Primary Healthcare Breakdown



Health Policy Orientation and System Readiness

The health policy in Mataram City demonstrates dedication to ensuring high-quality primary care. The presence of 11 community health centers, half of which offer inpatient services, indicates a focus on enhancing capacity rather than expanding facilities. Digital health readiness is evident as 91% of CHCs meet all nine national staffing standards, positioning them for the Integrated Primary Care (ILP) model. Stevens et al. (2021) mentioned that one CHC not meeting staffing standards could undermine system interoperability. Therefore, targeted support and supervision are crucial for achieving uniform readiness and integration into the national digital health ecosystem.

Impact on Health Administration Efficiency

In Mataram, health administrative efficiency was assessed through factors impacting performance and capacity. Indirect indicators enable evaluation through organizational readiness, infrastructure, and processes, given the lack of direct data. Primary care, with 11 health centers, maintains uniform registration, triage, referral, and reporting processes, thereby preventing fragmentation. Service protocol alignment follows efficiency theories linking routines to reduced costs and better coordination. The 16 hospitals form a compact referral network, which facilitates transfer times and expedites the flow of clinical data for reporting and quality assurance. This clustering contrasts with cross-district arrangements, which face delays due to logistical dispersion and jurisdictional boundaries.

Infrastructure plays a crucial role, and the lack of connectivity in Mataram necessitates semi-offline solutions, which can result in synchronization issues in areas with weak signals. A robust digital infrastructure enables continuous data exchange (Liu, Liu, Zang et al., 2024), thereby eliminating administrative delays in Indonesia's peripheral districts. The adoption of electronic medical records (EMR) by municipal hospitals signifies digital integration, enhancing institutional memory and expediting data compilation. Digital practices can enhance timeliness, reduce errors, and strengthen



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accountability. The configuration of health facilities, comprising 11 healthcare centers and 16 hospitals, along with the citywide implementation of Integrated Primary Care (IPC), drives efficiency in Mataram. However, while these conditions foster a supportive environment, empirical measurements are essential. Time savings and efficiency gains must be validated through field studies using standardized indicators and comparative metrics across districts to substantiate policy lessons empirically.

Participatory Governance Outcomes

The initiative to introduce Integrated Primary Care (IPC) at the Mataram City Health Office is being expanded to all community health centers. This move enhances collaboration among healthcare directors, cluster leaders, and health personnel, while engaging community members in creating service pathways. The strategy is documented through official communication, ensuring coordination and data validation for the following year. The program maintains feedback loops between providers and health authorities (Gallifant et al., 2023). The city has implemented the one-health platform, demonstrating collaboration between local government, facilities, and system providers, ensuring compliance with data standards and privacy governance.

The health centers in Mataram City meet minimum staffing standards with robust primary-care human resource capacity. However, one center needs support to transition to digital channels. These accomplishments reflect participatory governance outcomes, where inclusivity, accountability, and responsiveness strengthen institutional legitimacy. The involvement of stakeholders enhances transparency and fosters shared ownership of health reforms, thereby reducing resistance and improving the sustainability of digital integration. Such arrangements align with collaborative governance theories, which suggest that citizen engagement enhances the quality and effectiveness of services. The Mataram experience demonstrates how participatory governance can transform health administration into a co-produced system of accountability and equity, representing progress toward an integrated and efficient healthcare system.

Integration of Infrastructure, Management, and Community Involvement

The Mataram study of health administration offers three key insights. First, it integrates infrastructure, management, and community involvement, showing that decentralization drives digital transformation. Optimal results occur when these components work in tandem, while missing elements hinder progress. Second, this study redefines decision-making in digital contexts by incorporating bounded autonomy with clear guidelines. Local decision-making is most effective when it follows established protocols and leverages rapid feedback to generate actionable insights. Third, this study examines equity and efficiency, highlighting that focusing solely on technical aspects overlooks essential trade-offs. It advocates for equitable efficiency in decentralized digital health systems by adopting hybrid access strategies. Findings on healthcare infrastructure and government practices are presented in Table 3.



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Table 3

Dimension key finding Healthcare Infrastructure

	Dimension	Finding	Implication
1	Structural Resources	The dense infrastructure of 11 public health centres and 16 hospitals, and the full connectivity and adoption of integrated primary care, created favourable conditions for platform use.	Infrastructure is necessary but insufficient; it must be paired with governance mechanisms
2	Governance Practices	Clear decision rights, dashboard-based reviews, and accountability for data quality sustained adoption beyond initial rollout	Governance routines and managerial capacity are central to embedding digital health practices
3	Participation Mechanisms	Structured engagement with staff and communities enabled local adaptation while maintaining standardization.	Participation enhances contextual relevance and strengthens ownership without undermining
4	Unexpected Insight 1	Despite universal connectivity. Some facilities faced delays due to workforce readiness and workflow redesign constraints.	Connectivity alone is insufficient; human factors and workflow reforms are binding constraints.
5	Unexpected Insight 2	High hospital concentration did not ensure interoperability: vendor diversity and inconsistent standards compliance required managerial enforcement.	Interoperability depends on standard adherence and managerial guidelines, not just physical density.

DISCUSSION AND IMPLICATION

Interpretation of Key Findings

Research in Mataram City explored decentralization and digital health systems by integrating structural capacity, governance, and participation. Findings show that structural resources of 11 health centers and 16 hospitals, with citywide ILP implementation, enable digital platform deployment. Infrastructure alone is insufficient. Governance routines are essential, requiring defined decision-making rights, oversight dashboards, and accountability for data quality. Digital transformation requires aligned authority, incentives, and effective monitoring through the healthcare administration. Participation functions as a contextualizing mechanism, with facility staff and community engagement enabling workflow adaptations while meeting national standards. This shows conditional autonomy, where structured participation enhances relevance and adoption. These findings support decentralization and decision space theories by showing local performance depends on authorized choices and managerial capacity.

Theoretical frameworks emphasize roles and accountability for data quality, aligning with realist approaches that utilize context-mechanism-outcome frameworks to demonstrate how decentralization, the integration of health infrastructure, and feedback-driven participation improve processes (Vinson, 2021). Facilities face implementation delays due to resource and workflow challenges. Hospital concentration



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did not ensure interoperability, highlighting the need for ILP guidelines. These findings highlight the importance of infrastructure, connectivity, governance, and institutional design in digital health transformations. Decision space theory demonstrates how the choices of local actors influence performance. Principal-agent theories link roles and accountability to the success of implementation. In Mataram City, infrastructure and participation enabled adoption despite resource constraints (do Nascimento et al., 2023). Hospital concentration did not guarantee interoperability, underscoring the importance of ILP guidelines.

The establishment of 11 public health centers and 16 hospitals with Integrated Primary Care (IPC) and connectivity forms the foundation for digital health platforms. The system's success depends on effective governance and seamless data integration, while maintaining high service quality. As noted by Sheik and Abimbola (2021), successful digital health implementation requires access to networks, effective health management policies, and accountability for data quality, as shown in Table 2. Engaging staff and communities through participatory approaches enables local adaptation. Two key insights emerge: universal connectivity alone cannot accelerate implementation due to the complexities of workflow redesign, and digital health initiatives require a skilled workforce (Ferreira et al., 2025). The diversity of vendors and standards necessitates the development of technical guidelines for the exchange of clinical data. These findings highlight the significance of structural resources and governance in facilitating the integration of digital health.

The evaluation of Mataram's healthcare infrastructure shows that digital health integration extends beyond physical resources. Despite 11 health centers, 16 hospitals, citywide ILP implementation, and connectivity, infrastructure alone cannot sustain digital transformation. Effective governance requires apparent decision-making authority and accountability for data quality. Engaging health facility staff through participatory arrangements allows contextual modifications while maintaining standards. Some facilities face delays due to workforce and workflow challenges. The geographic concentration of hospitals does not ensure interoperability across vendor systems (Fennelly et al., 2024). These findings suggest that resources, governance, and adaptive capacities influence digital health adoption. Digital transformation succeeds when infrastructure, governance, and participation align.

Implications for Health Administration Policy

A policy framework for municipal and provincial administrators should combine regulatory guidelines with a limited degree of autonomy, allowing for flexibility while maintaining accountability and transparency. These guidelines should specify key data elements, such as patient identifiers and facility registries, outline reporting requirements, and establish privacy, security, and procurement standards that require vendor agreements and open interfaces. Limited autonomy should enable facilities to adjust workflows, create forms, and organize training, while complying with interoperability and safety constraints. Implementation governance requires a joint IT health steering committee that meets monthly requirements, reviews dashboards, and incorporates facility feedback loops. Managerial evaluations should include data-use



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meetings to address these issues. Interoperability operations require a citywide audit of healthcare facilities, a heatmap of interfaces and errors, and standardized change-control processes for configuration adjustments.

Participatory governance requires distinguishing between local flexibility and national standards, maintaining forums that articulate privacy-by-design and role-based access to build trust, and offering digital and paper services to ensure fairness for users with low literacy and connectivity issues. Budgeting must include ongoing governance costs beyond devices and bandwidth, such as dashboarding, facilitation, and coaching. Since one health center lacks the nine standard staffing categories, targeted workforce mentoring is crucial to prevent bottlenecks in an otherwise mature service network.

Limitations

The limitations of this study warrant consideration regarding scope and generalizability. The research was confined to Mataram City, an urban area with excellent connectivity and a high concentration of healthcare facilities. The findings may not apply to regions with limited service availability or inadequate network coverage, requiring caution when applying the results to less-resourced areas. Measurement limitations affect the conclusions. The study used publicly verifiable data for healthcare facilities and connectivity, triangulated with qualitative sources. However, detailed operational data, such as cycle times, cost accounting, and workload indicators, were unavailable, preventing the precise quantification of efficiency. Future research should incorporate time-motion studies and standardized cost tracking to translate observations into verifiable savings.

Navigating system heterogeneity is challenging due to the presence of multiple vendor platforms, which complicates the links between improvements and interventions. To strengthen causal inference, change logs, incident taxonomies, and interoperability dossiers should document interface failures. The introduction of electronic medical records (EMR) and Integrated Primary Care (ILP) in Mataram could advantage regions lacking these systems. Testing frameworks in areas with infrastructure, including other Lombok districts, are needed. Future studies should focus on longitudinal research. Monthly dashboards can monitor governance and participation to identify effective combinations of approaches that drive success. Privacy audits are essential for linking data protection with adoption trends. Mataram Health Center demonstrates governance requirements for digital transformation, enabling policymakers to develop a model for health reform.

CONCLUSION

Reforming digital health requires a socio-technical systems perspective, where technology, practices, and governance evolve in tandem. Balancing central standards with local flexibility reduces costs while maintaining problem-solving capability. Performance improvements align with constraints as enablers, setting boundaries that do not hinder innovation. Limited autonomy allows teams to experiment within parameters, with feedback determining success. Digital underperformance stems from



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unclear rules and weak accountability, resulting in increased costs. Digitalization benefits are unevenly distributed, with initial costs affecting staff before benefits emerge. The solution requires linking decision-relevant measures to managerial routines. Institutional memory depends on documenting decisions. Learning occurs through a combination of mixed methods, incorporating metrics with process tracing, and emphasizing mechanisms over changes.

In the evaluations, we differentiated between actions and outcomes. A high message volume does not necessarily indicate clinical significance, and frequent dashboard logins do not significantly impact outcomes. Establishing boundaries is crucial for extending the findings beyond specific regions. The Mataram case demonstrates feasibility through connectivity, documentation, and coordinated facilities. Central authorities facilitate convergence by utilizing templates to reduce costs and streamline processes. Privacy requires default settings for identity management, access control, and audit trails within federated learning. Equity requires monitoring stratification because improvements in averages with increasing variance are ineffective. The framework should evaluate performance by facility type, location, gender, and coverage, while preventing re-identification of individuals. Participation serves as a governance tool for identifying errors. Therefore, advanced analytics must follow these principles. Predictive models rely on the quality of the data. Poor change control leads to model drift, and a lack of vendor accountability worsens errors. Treating digital transformation as a non-recurring capital expense in public financing can lead to a decline in costs, including analytical staff, meeting times, and oversight tools.

In Mataram, constrained autonomy with regulatory safeguards ensures that national standards align with local flexibility, thereby promoting a balance between national and regional interests. Hospitals lack data exchange due to vendor systems, outdated workflows, and inconsistent governance. The report emphasizes master data, interface standards, change control, vendor SLAs, and privacy-by-design. Hybrid access with paper backup enhances equity for users with low literacy, older adults, and vulnerable populations. Policymakers should establish guidelines for identifiers, reporting, privacy, and vendor criteria, allowing regional adaptability. The agenda begins with governance stabilization. The city health office holds monthly Steering Committee meetings for feedback. A citywide evaluation should assess hospital interfaces and resolution times. Healthcare mapping should focus on data exchanges and master rules. A single source of patient IDs and facility lists was needed. Digital and paper options require user-friendly interfaces.

The intervention focuses on mentoring to optimize workflow in understaffed centers. Guidelines regulate triage, registration, referral, and reporting processes. Facility Plan-Do-Study-Act Cycles test enhancements. Quarterly workshops collect proposals while maintaining standards. A summary covers adoption, data quality, and interface reliability. Public visibility builds trust. Budget includes governance and dashboarding. Recurring costs drive performance, with fairness indicators guiding improvements. Organizational cultures evolve by integrating interfaces with documentation. In decentralized health administration, Mataram City has improved its understanding in



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three ways. First, aligning infrastructure reliability and governance will enhance the adoption of these systems. Second, it refines decision space theory through bounded autonomy within guidelines. Local discretion is effective when standards and feedback loops are clearly defined. Third, it equates administrative fairness with efficiency through dashboard monitoring, emphasizing the utilization of pathways and data protection.

Acknowledgements:

The authors sincerely thank all participants, including healthcare professionals and local policymakers, for their valuable time and insights. Special thanks to the local health offices and community organizations for their support during the data collection. This research would not have been possible without the dedication and cooperation of all contributors involved in the study.

Ethics Statement:

All procedures performed in this study involving human participants adhered to the ethical standards of the institutional research committee. All the participants received information sheets and provided **written informed consent**. For participants with low literacy, permission was obtained orally using witness signatures. Privacy and confidentiality were ensured throughout the study, and participants were assured of their right to withdraw at any point without consequence.

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