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Building an Inclusive Digital Public Infrastructure: A Strategy for Strengthening Governance

Andi Rahmatullah[1], Rina Kurniati Akbar[2]

[1]Department of Public Administration, Halu Oleo University, Kendari, Indonesia
[2]Faculty of Government and Public Policy, Hasanuddin University, Makassar, Indonesia

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Corresponding Author:
Andi Rahmatullah

Email:
arahmatullah@yahoo.com

ABSTRACT

***Purpose**: This study explores the state of digital governance in Southeast Sulawesi, focusing on the regions of Kendari, Kolaka, and Buton. It aims to assess the disparities in digital infrastructure readiness, institutional capacity, and inclusivity in these areas and their implications for effective governance*

***Subjects and Methods:** The research employs a qualitative methodology, including document analysis, interviews, and participant observation, to examine the local implementation of national digital policies.*

***Results:** The findings reveal significant disparities in institutional readiness, technological integration, and citizen participation across the three regions. Kendari demonstrates stronger governance capacity, integrated digital systems, and higher public participation, while Kolaka and Buton continue facing infrastructure limitations, fragmented coordination, and low digital literacy. Collaborative initiatives involving universities and civil society organizations contributed positively to community engagement and digital inclusion.*

***Conclusions:** Sustainable digital governance requires institutional reform, inclusive participation, technological integration, and equitable capacity development to strengthen governance effectiveness and social equity in peripheral regions.*

INTRODUCTION

The rapid expansion of digital technologies has profoundly reshaped the architecture of public governance worldwide, introducing new modes of service delivery, citizen participation, and intergovernmental coordination (Das, 2024). In the Global South, particularly within Southeast Asia, digitalization has become a strategic driver for improving transparency, efficiency, and inclusivity in governance systems. The notion of *Digital Public Infrastructure* (DPI) an integrated framework of digital identification, interoperable payment systems, and data exchange platforms has gained prominence as a foundation for sustainable digital transformation (Mehta, 2021).

Countries such as India and Indonesia have demonstrated that DPI initiatives can significantly enhance administrative efficiency and access to essential services when properly institutionalized (Nilekani & Shah, 2023). However, the challenge of ensuring inclusivity within these digital infrastructures remains unresolved, especially in peripheral regions where socio-economic and connectivity gaps persist. In Southeast Sulawesi, Indonesia, digital transformation has advanced unevenly across local government units, leading to disparities in service accessibility, policy coordination, and citizen participation (Widodo & Kusnan, 2023).

The increasing policy attention toward DPI reflects the recognition that digital transformation is no longer a purely technological agenda but a governance imperative. It requires institutional adaptation, capacity building, and equitable access mechanisms that safeguard against digital exclusion (Kattel & Mazzucato, 2020; Cordella & Tempini, 2021). As regional governments in Indonesia adopt national digital governance frameworks such as SPBE (*Sistem Pemerintahan Berbasis Elektronik*), challenges of interoperability, data governance, and institutional readiness have become more apparent.

Moreover, despite progress in connectivity infrastructure, Southeast Sulawesi continues to face fragmented digital ecosystems characterized by weak coordination among agencies, insufficient digital literacy, and limited integration of digital platforms across administrative sectors (Hafel, 2023). The lack of coherent strategies for building inclusive DPI exacerbates regional disparities, undermining efforts to achieve the Sustainable Development Goals (SDGs), particularly Goal 16 on effective, accountable, and inclusive institutions.

The core problem addressed in this study lies in the persistent *digital governance gap* between central and peripheral regions in Indonesia, which limits the potential of DPI to promote equitable and accountable public service delivery. While national frameworks such as the Indonesia Digital Roadmap 2021–2024 have laid the groundwork for digital transformation, their localized implementation often encounters administrative, cultural, and infrastructural barriers. Many local governments lack the institutional capacity and digital readiness to translate these policies into operational frameworks that are contextually responsive (Gasco-Hernandez et al., 2022).

This issue raises a critical question: how can regional governments build inclusive digital infrastructures that enhance governance capacity and citizen engagement in areas with limited technological and institutional resources? Several general solutions have been proposed in the literature, emphasizing the need for a *whole-of-government* and *whole-of-society* approach to digital transformation (Määttä, 2021). Such approaches advocate for policy alignment across levels of government, integration of digital platforms, and inclusion of civil society in digital policymaking processes (Janssen & Estevez, 2013).

The integration of DPI elements digital identity, open data systems, and payment interoperability serves as a backbone for enabling participatory and transparent governance ecosystems (Lips, 2019). While these frameworks offer conceptual clarity, their practical adaptation in peripheral regions requires an understanding of local governance dynamics and community participation patterns (Ansell & Torfing, 2021). Without such localized adaptation, digital initiatives risk reinforcing existing inequalities and reproducing centralized governance hierarchies in digital form (Madon & Sahay, 2020).

Scholars have increasingly highlighted the need for adaptive governance models to strengthen institutional resilience and inclusivity in digital transformations (Sørensen & Torfing, 2018). Empirical studies in Southeast Asia show that the most effective DPI frameworks are those that embed local participation, cross-sectoral collaboration, and institutional learning into their design (Lim, 2022). For instance, India's *Aadhaar* system and Indonesia's SPBE both illustrate how integrated digital identity systems can enhance service efficiency, but also reveal the risks of exclusion if not coupled with citizen-centric design and robust data protection mechanisms

The Philippines' *e-Government Masterplan* demonstrates how multi-stakeholder partnerships can facilitate inclusivity in digital policy implementation. These experiences underscore that technology alone cannot solve governance disparities strong institutions and participatory mechanisms remain central to sustainable digital transformation. Within this scholarly discourse, Southeast Sulawesi presents a compelling context for examining the interplay between digital infrastructure, institutional capacity, and inclusivity.

Shoesmith et al. (2020) said that, the region has undergone significant administrative reforms under Indonesia's decentralization framework but continues to struggle with uneven governance performance, limited interagency coordination, and inadequate digital literacy among civil servants. Previous studies have shown that peripheral provinces often face structural disadvantages in digital capacity development due to limited fiscal space and human capital

(Grimes, 2003; Oppido et al., 2023). However, emerging local innovations such as community-based digital inclusion programs and partnerships with local universities indicate growing potential for regional adaptation of DPI principles (Rakuasa et al., 2024).

Despite these advances, a comprehensive analysis of how inclusive DPI strategies can be designed and institutionalized at the subnational level remains largely absent from current literature. A review of related studies suggests that while much attention has been given to national-level digital policy frameworks, there is limited research exploring how subnational governments operationalize inclusivity within digital infrastructure planning (Madon & Sahay, 2020; Cordella & Tempini, 2021). Most analyses focus on technological adoption and service efficiency, overlooking the institutional and social dimensions that determine the sustainability of digital transformation.

This gap is particularly relevant for Southeast Sulawesi, where digital initiatives are often externally driven and lack systemic integration into governance structures. Consequently, this study situates itself within the intersection of *digital governance*, *institutional capacity*, and *inclusive public policy*, aiming to uncover how local governments can strengthen governance through adaptive and inclusive digital infrastructures. The primary aim of this study is to develop a strategic framework for building inclusive digital public infrastructure as a means of strengthening governance in Southeast Sulawesi. It proposes that digital inclusion must be institutionalized through participatory design, interagency collaboration, and capacity-building mechanisms.

The novelty of this study lies in its regional focus and its integration of institutional capacity theory with the concept of digital inclusivity, offering an empirical contribution to the understanding of subnational digital governance in Indonesia. By combining policy analysis, field interviews, and document review, the study provides a holistic perspective on the challenges and opportunities of implementing DPI in peripheral regions. Ultimately, it seeks to inform policymakers, practitioners, and scholars about the pathways toward equitable and sustainable digital governance that bridges the divide between technology and public value in Southeast Sulawesi.

METHODOLOGY

Research Design

This study employs a qualitative research design to explore how inclusive digital public infrastructure (DPI) can be strategically developed to strengthen governance in Southeast Sulawesi, Indonesia. The qualitative approach was selected because it enables an in-depth exploration of complex governance processes, institutional behavior, and socio-political dynamics that shape digital transformation. As Creswell & Poth (2018) assert, qualitative inquiry is well-suited for examining phenomena that require understanding subjective meanings and contextual influences. The research integrates institutional analysis with a governance framework to investigate the extent to which digital inclusion principles are embedded within local government strategies. Guided by inductive reasoning, the study develops conceptual insights grounded in empirical realities through interviews, document analysis, and field observations.

Philosophical Foundation

The methodological orientation of this research is rooted in the interpretivist paradigm, which emphasizes the subjective meanings constructed by individuals and institutions involved in digital governance. Interpretivism acknowledges that governance practices are shaped not only by formal structures but also by perceptions, values, and social interactions (Denzin & Lincoln, 2011). The study therefore examines how local government officials, technology providers, civil society organizations, and citizens interpret and operationalize concepts such as transparency, participation, and accountability in the development of DPI. This paradigm enables the researcher to investigate power relations, institutional constraints, and adaptive policy processes that may not be visible through quantitative methods (Kettunen & Kallio, 2021).

Research Sites and Sampling Strategy

Fieldwork was conducted from January to September 2024 in three administrative regions of Southeast Sulawesi: Kendari City, Kolaka Regency, and Buton Regency. These sites were purposively selected to represent variations in digital readiness, governance capacity, and socio-economic contexts. Kendari City serves as an urban innovation hub with advanced infrastructure, Kolaka represents a mid-level region with growing digital initiatives, while Buton reflects a rural locality facing substantial infrastructural and connectivity challenges. This variation aligns with Alordiah & Oji (2024) maximum variation sampling strategy, which enhances the breadth and depth of qualitative insights. Participants were purposively selected to ensure representation of diverse stakeholders engaged in or affected by digital governance.

Data Collection Techniques

Data collection employed three complementary methods document analysis, semi-structured interviews, and participant observation to ensure triangulation and depth.

Document Analysis

Document analysis involved reviewing strategic policy documents, digital transformation roadmaps, regional development plans, and regulations issued between 2020 and 2024. These documents were analyzed to assess the presence of digital inclusion principles, interagency coordination mechanisms, and policy coherence in DPI development. This stage provided a foundational understanding of institutional commitments and governance structures.

Semi-Structured Interviews

Semi-structured interviews were conducted with thirty participants, including regional government officials, ICT office personnel, planning agency staff, public service administrators, university experts, civil society actors, and leaders of community-based digital initiatives. Interviews explored five thematic areas: policy design and implementation, institutional coordination, citizen engagement, digital literacy challenges, and perceived outcomes of DPI. Conducted face-to-face or virtually depending on participant availability, each interview lasted 45–90 minutes and was recorded with informed consent. Transcripts were prepared verbatim for thematic analysis.

Participant Observation

Participant observation was carried out during public consultations, digital literacy workshops, and regional coordination meetings related to e-governance. Observations focused on stakeholder interactions, the practical use of digital tools, and barriers to citizen participation. Field notes enriched the understanding of how policies translate into real-world implementation and how institutional actors engage with digital platforms.

Data Analysis Procedures

Data analysis followed a multi-layered approach integrating institutional capacity theory and the digital governance maturity model. Thematic analysis, based on Braun & Clarke's (2019) six-step procedure, guided the coding and theme development process. In the first phase, within-case analysis was conducted separately for Kendari, Kolaka, and Buton to identify unique governance structures, institutional strengths, and digital inclusion challenges. The second phase involved cross-case comparison to highlight convergences and divergences in leadership commitment, policy integration, and citizen participation. The final phase entailed theoretical interpretation, positioning empirical insights within broader frameworks on digital governance and inclusive infrastructure development. This structure ensured analytical rigor while allowing inductive patterns to emerge from the data.

Validation and Credibility Strategies

To enhance the trustworthiness of findings, several validation techniques were employed. Member checking allowed selected interviewees to review and confirm the accuracy of preliminary interpretations, ensuring alignment with their lived experiences. Peer debriefing was conducted with academic experts in governance and digital policy to refine analysis and minimize

researcher bias. Triangulation across interviews, documents, and observations strengthened analytical credibility by confirming patterns across data sources. These procedures collectively ensured the robustness and reliability of the study.

Ethical Considerations

The entire research process adhered to strict ethical standards, with clearance obtained from the Institutional Review Board of Universitas Hasanuddin. All participants were informed about the study's aims, their voluntary involvement, and their right to withdraw at any time. Informed consent was obtained prior to data collection. Confidentiality was maintained through pseudonyms, anonymization of sensitive information, and secure digital storage of all research materials. These practices align with the ethical guidelines of the American Political Science Association.

Methodological Contribution

The methodological design of this study integrates empirical depth, contextual sensitivity, and theoretical grounding. By employing qualitative methods across diverse local settings, the research allows for an enriched understanding of institutional adaptation, citizen participation, and digital governance processes in developing regions. This approach answers contemporary calls for contextualized digital governance analysis in the Global South (Kattel & Mazzucato, 2020). The methodology supports both exploratory and explanatory dimensions exploring under-studied regional dynamics while explaining causal relationships between institutional capacity and inclusive digital governance. Ultimately, this methodological strategy positions local voices at the forefront, representing a significant contribution to inclusive policy research.

RESULTS AND DISCUSSION

This section presents the empirical findings regarding the development of inclusive Digital Public Infrastructure (DPI) in Southeast Sulawesi, particularly in Kendari City, Kolaka Regency, and Buton Regency. The findings are organized into several interconnected themes derived from thematic analysis, including institutional readiness, inclusivity and citizen participation, technological integration, leadership commitment, interagency collaboration, and social inclusion. The analysis demonstrates that digital governance development in Southeast Sulawesi is shaped not only by technological capacity but also by institutional adaptation, collaborative governance, and socio-cultural dynamics. The discussion integrates interview findings, field observations, and policy document analysis to explain how local governments operationalize digital transformation within different governance contexts.

Institutional Capacity and Governance Readiness

The findings indicate that institutional capacity constitutes the primary determinant of successful digital governance implementation. Variations in institutional readiness across Kendari, Kolaka, and Buton reveal unequal levels of administrative capability, policy coordination, and digital adaptation. Kendari demonstrates relatively advanced institutional maturity due to strong leadership support, stable budgeting, and integrated digital governance planning. Most regional agencies in Kendari already operate under interconnected digital administrative systems, enabling faster coordination and service delivery.

An official from the Kendari Communication and Informatics Office explained:

> *"Since the city government started integrating digital services, coordination among agencies has become much easier. Before that, every office worked separately and data verification often took a long time. Now licensing, population administration, and health data can be checked more quickly because the systems are connected. The mayor also regularly monitors digital service performance directly through evaluation meetings every month."* (Participant KDI-04, Regional ICT Office)

Field observations also showed that Kendari has developed a dedicated digital governance task force responsible for supervising cross-agency digital coordination. This institutional arrangement strengthens administrative consistency and supports policy continuity.

By contrast, Kolaka and Buton still experience fragmented governance structures. Several agencies continue operating independent digital systems without standardized interoperability mechanisms. In Buton, institutional coordination remains weak because digital initiatives are often treated as sectoral programs rather than integrated governance reforms.

A staff member from Buton Regency stated:

> *"Most agencies still manage their own applications independently. Sometimes one office does not even know what system another office is using. When there are technical problems, coordination becomes difficult because there is no integrated command system. Budget limitations also make it hard to upgrade the platforms regularly."* (Participant BTN-07, Administrative Services Division)

These findings indicate that institutional maturity strongly influences the sustainability of DPI implementation. Regions with stronger governance structures are more capable of integrating technology into public administration, while weaker institutional environments tend to reproduce fragmentation and inefficiency.

Table 1. Comparative Institutional Readiness Across Research Sites

Indicators	Kendari	Kolaka	Buton
Digital Governance Coordination	Highly integrated	Partially coordinated	Fragmented
Institutional Readiness	Advanced	Moderate	Limited
Human Resource Capacity	Strong	Developing	Weak
Budget Support	Stable	Moderate	Limited
Digital Service Integration	High	Partial	Minimal

Source: Interview and field observation data, 2024.

Table 1 demonstrates that Kendari possesses stronger institutional readiness compared to Kolaka and Buton. The differences are reflected in coordination mechanisms, human resource capacity, and digital system integration.

Inclusivity and Citizen Participation

The second major finding concerns inclusivity and citizen participation in digital governance. Although local governments increasingly promote digital services, access and participation remain uneven across socio-economic groups. In Kendari, participatory digital platforms have enabled citizens to report public service complaints, monitor administrative processes, and access government information online. However, participation remains concentrated among urban residents, students, and civil servants.

A local government officer in Kendari explained:

> *"The digital complaint platform is already functioning properly, but users are mostly from urban communities. Residents from coastal villages and outer areas still rarely use it. Many people are unfamiliar with digital applications or do not own proper devices. Some older citizens also prefer direct face-to-face services because they trust manual procedures more."* (Participant KDI-09, Public Service Agency)

In Kolaka, inclusivity efforts are supported through collaboration with universities and civil society organizations. Digital literacy workshops targeting women, youth groups, and rural communities have gradually increased community engagement with online public services.

A facilitator from a university-based digital literacy program stated:

> *"Women participating in the training programs are starting to use online health and social assistance services independently. At first many participants were hesitant because they thought digital systems were complicated. After several mentoring sessions, they became more confident using government applications and accessing public information online."* (Participant KLK-03, Digital Literacy Facilitator)

In Buton, the situation remains more challenging because limited internet infrastructure and low digital literacy continue to hinder participation. Rural communities often distrust digital systems due to concerns regarding administrative errors and data misuse.

A community leader from Buton explained:

> *"People here still prefer coming directly to the office rather than using applications. They worry their documents will not be processed correctly online. Some residents tried digital registration before, but because the network was unstable, they had to repeat the process several times."* (Participant BTN-11, Community Organization Leader)

These findings demonstrate that digital inclusivity depends not only on infrastructure availability but also on trust-building, literacy development, and socio-cultural adaptation.

Table 2. Community Participation and Inclusivity Indicators

Indicators	Kendari	Kolaka	Buton
Citizen Access to Digital Services	High	Moderate	Low
Digital Literacy Programs	Extensive	Developing	Limited
Community Trust in Digital Services	Moderate–High	Moderate	Low
Participation of Rural Communities	Limited	Moderate	Very Limited
Civil Society Involvement	Strong	Moderate	Weak

Source: Interview data and participant observation, 2024.

Table 2 indicates that community participation levels are strongly associated with digital literacy access and institutional trust.

Technological Infrastructure and System Integration

The findings further reveal significant disparities in technological integration and interoperability among the three regions. Kendari has implemented interconnected digital systems under the SPBE framework, allowing agencies to exchange data through integrated servers. Administrative processes related to licensing, civil registration, and health services have become more efficient because of synchronized databases.

An IT officer from Kendari stated:

> *"Currently most regional agencies already use a unified digital identity system. Data synchronization has reduced administrative duplication and accelerated service verification. For example, business permit applications can now automatically connect with population databases without requiring manual checks from multiple offices."* (Participant KDI-06, Government IT Division)

In contrast, Kolaka and Buton still rely on partially disconnected systems. Several applications are developed independently without interoperability standards, leading to inefficiencies and duplicated administrative processes.

A regional ICT staff member in Kolaka explained:

> *"The biggest challenge is compatibility between applications. Some systems were developed by external vendors using different standards, so connecting them becomes difficult. Data sharing between agencies still depends on manual coordination in many cases."* (Participant KLK-07, ICT Administration Office)

Field observations confirmed that infrastructure instability also affects digital governance implementation in rural Buton. Network disruptions frequently interrupt online administrative services, reducing public confidence in digital systems.

Table 3. Technological Integration and Infrastructure Conditions

Indicators	Kendari	Kolaka	Buton
Internet Infrastructure	Strong	Moderate	Weak
System Interoperability	Advanced	Partial	Minimal

Unified Data Management	Available	Limited	Absent
Technical Maintenance Capacity	High	Moderate	Low
Reliability of Digital Services	Stable	Moderately Stable	Unstable

Source: Government documents, interviews, and field observation, 2024.

The findings suggest that technological integration remains uneven because infrastructure development is not always accompanied by institutional coordination and technical standardization.

Leadership Commitment and Institutional Reform

Leadership commitment emerged as another critical factor influencing digital transformation outcomes. Kendari demonstrates strong political support for digital governance, reflected in consistent policy direction and institutional reforms. The mayor actively supervises digital innovation programs and allocates specific budgets for service integration.

A senior planning official explained:

> *"Digital transformation in Kendari is treated as part of governance reform, not merely technology procurement. The mayor requires every agency to integrate service systems and regularly evaluates implementation progress. This political commitment creates pressure for agencies to adapt and collaborate."* (Participant KDI-02, Regional Planning Agency)

Conversely, leadership inconsistency in Buton has disrupted policy continuity. Frequent administrative changes have resulted in shifting priorities and interrupted digital programs.

An official from Buton noted:

> *"When leadership changes, many digital programs are postponed or redirected. Some initiatives stop before reaching implementation stages because budget priorities shift toward other sectors. This makes long-term digital planning difficult."* (Participant BTN-05, Regional Secretariat Office)

These findings indicate that sustainable DPI development requires stable political leadership and institutional commitment.

Interagency Collaboration and Institutional Resilience

Interagency collaboration significantly influences governance resilience and digital integration. Kolaka provides an important example where collaboration between the Regional Development Planning Agency and the Communication Office facilitated the development of a shared public data platform.

A planning officer explained:

> *"The integrated data initiative started because agencies realized they could not work independently anymore. Bappeda established data standards while Kominfo managed technical integration. Although implementation is still limited, the collaboration already helps improve planning accuracy and public service monitoring."* (Participant KLK-01, Regional Planning Agency)

Meanwhile, institutional silos remain dominant in Buton. Agencies continue operating independently without coordinated recovery systems during technical disruptions.

A university expert involved in regional consultation meetings explained:

> *"Fragmented governance structures create inefficiency because every agency builds separate systems. There is no centralized mechanism for coordination or crisis response. When one platform fails, other agencies cannot provide technical backup."* (Participant BTN-14, Academic Expert)

The findings confirm that collaborative governance strengthens institutional resilience and improves administrative adaptability.

Social Inclusion and Gender Dimensions

The study also identified persistent social inequalities within digital governance participation. Women, elderly citizens, and marginalized rural groups face substantial barriers to accessing digital services. Limited access to smartphones, unstable internet connectivity, and cultural restrictions reduce women's participation in several rural communities.

A female participant from Buton explained:

> *"Many women here still depend on family members when using digital applications. Some do not own smartphones personally, while others feel uncomfortable dealing with online systems because they are unfamiliar with the technology."* (Participant BTN-18, Women's Community Group)

Kolaka has attempted to address these inequalities through gender-inclusive training programs, although participation remains uneven. These findings indicate that inclusive digital governance requires socio-cultural adaptation alongside technological expansion. Without targeted interventions, digital transformation risks reproducing existing social inequalities within governance systems.

The findings demonstrate that building inclusive Digital Public Infrastructure in Southeast Sulawesi depends on the interaction between institutional capacity, technological integration, leadership commitment, and social inclusion. Kendari illustrates how stronger governance structures can accelerate digital transformation, while Kolaka and Buton reveal the structural limitations that continue to constrain equitable digital governance development.

Digital Infrastructure and Internet Accessibility

Digital infrastructure remains one of the most decisive factors influencing the effectiveness of governance transformation in Southeast Sulawesi. The findings show that Kendari possesses stronger connectivity and wider internet accessibility compared to Kolaka and Buton. Urban concentration, institutional investment, and telecommunications support contribute significantly to this condition. In contrast, rural regions continue facing unstable connectivity, limited digital facilities, and unequal access to communication technology.

Table 4. Internet Access and Digital Infrastructure Indicators

Indicators	Kendari	Kolaka	Buton
Internet Penetration Rate (%)	82.4	68.7	49.2
Households with Internet Access (%)	79.1	61.5	41.8
Villages with Stable 4G Access (%)	91.5	73.2	52.6
Public Wi-Fi Service Points	214	96	41
Average Mobile Network Coverage (%)	96.3	84.7	67.4

Source: Statistics Indonesia (BPS Southeast Sulawesi, 2024); Ministry of Communication and Informatics Regional Report, 2024.

The data in Table 4 indicate substantial disparities in digital infrastructure across the study areas. Kendari demonstrates relatively advanced connectivity conditions that support integrated digital public services and administrative efficiency. Meanwhile, Buton continues to experience serious limitations in internet coverage and digital accessibility, particularly in rural and coastal communities. These inequalities directly affect citizen participation in digital governance platforms and reduce the effectiveness of online public services.

An official from the Kendari Communication and Informatics Agency explained:

> *"Internet infrastructure in Kendari has improved significantly during the last few years. Almost every district already has stable network access, and many public service offices are connected through integrated systems. Residents can now access licensing services, administrative documents, and complaint systems much faster than before. The challenge now is ensuring equal digital literacy, especially among elderly citizens and lower-income communities."* (Participant KDI-04, Regional ICT Office)

A village administrator from Buton stated:

> *"The biggest issue here is still the unstable network connection. Sometimes residents have to travel to the district center just to access online administrative services because the signal in the village is weak. When the internet goes down, digital services stop completely, so people return to manual procedures at government offices."* (Participant BTN-08, Village Administrative Officer)

The interview findings confirm that infrastructure inequality remains a structural barrier to inclusive digital governance implementation in peripheral regions.

SPBE Performance and Institutional Readiness

Institutional readiness is reflected in the SPBE (Electronic-Based Government System) performance scores issued by the Ministry of Administrative and Bureaucratic Reform. These indicators measure governance integration, digital public service capacity, institutional coordination, and administrative innovation.

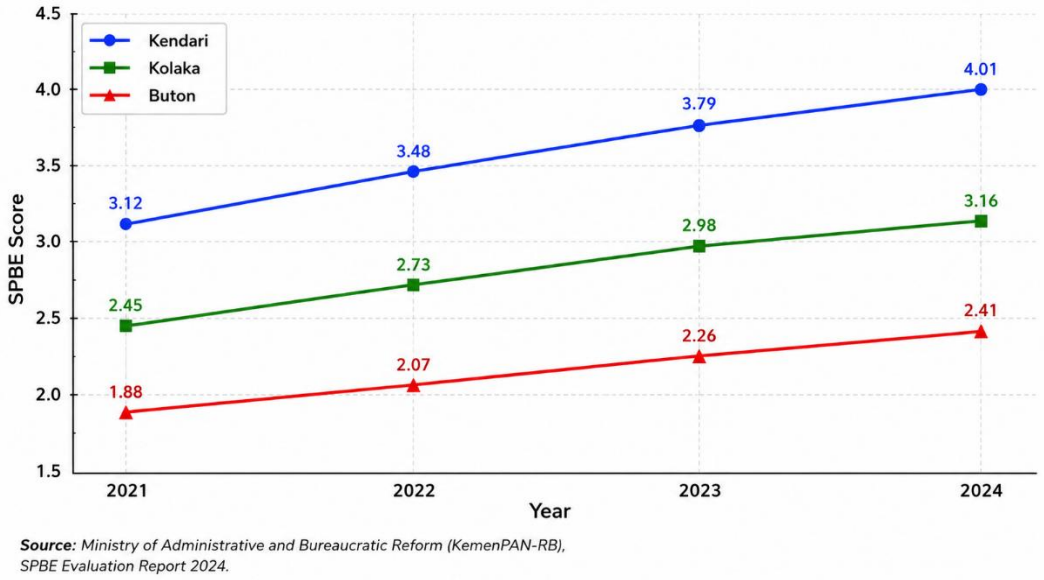

Figure 1. SPBE Performance Scores in Southeast Sulawesi (2021–2024)

Kendari consistently records the highest SPBE performance among the three regions. Strong leadership commitment, institutional coordination, and budget allocation contribute to the city's digital governance progress. Kolaka shows gradual improvement due to increasing collaboration among agencies and educational institutions. However, Buton remains at the lower level because of fragmented institutional structures and limited technical capacity.

A planning officer from Kendari explained:

> *"The city government treats digital governance as part of administrative reform rather than simply technology procurement. Every regional agency is required to integrate services into the SPBE framework. There are regular evaluations from the mayor's office, and agencies that fail to adapt receive direct administrative reviews. This creates stronger institutional discipline for digital transformation."* (Participant KDI-02, Regional Planning Agency)

Meanwhile, a public administration officer in Buton stated:

> *"We are still struggling with institutional coordination. Some agencies already have digital applications, but they are not connected to each other. Budget limitations also make it difficult to maintain the systems consistently. Sometimes new applications are launched, but there is no long-term support for maintenance or staff training."* (Participant BTN-05, Regional Secretariat Office)

The findings illustrate that institutional commitment and policy continuity are essential for sustainable digital governance implementation.

Digital Literacy and Community Participation

Digital literacy represents another critical factor shaping inclusivity within digital governance systems. The findings indicate that differences in digital competency strongly influence citizen participation in online public services and governance platforms.

Table 5. Community Digital Literacy Indicators

Indicators	Kendari	Kolaka	Buton
Population with Basic Digital Skills (%)	76.8	59.4	38.7
Participation in Government Digital Literacy Programs (%)	41.5	28.3	14.9
Women Participating in Digital Training (%)	52.1	37.6	19.5
Elderly Population Using Digital Public Services (%)	31.7	18.4	8.9
Citizens Using Online Government Services (%)	72.3	51.6	29.8

Source: Regional Communication and Informatics Offices; University-Based Digital Literacy Programs, 2024.

The data demonstrate that Kendari has achieved relatively high levels of digital literacy and online service utilization. Kolaka shows moderate progress, particularly through university-supported training programs. Meanwhile, Buton continues to experience limited community participation due to low digital literacy and restricted internet access.

A facilitator from a digital literacy program in Kolaka explained:

> *"At the beginning, many participants especially women and elderly residents were hesitant to use online public services because they felt digital applications were complicated. After several training sessions, they became more confident accessing health services, social assistance applications, and online population administration. The mentoring approach turned out to be more effective than formal classroom training."* (Participant KLK-03, Digital Literacy Facilitator)

A women's community leader from Buton stated:

> *"Many women in rural areas still rely on younger family members when using digital applications. Some do not own smartphones personally, while others are afraid of making mistakes during online registration. Even when government applications are available, participation remains low because people are unfamiliar with the systems."* (Participant BTN-18, Women's Community Group)

These findings indicate that digital transformation requires not only technological expansion but also social adaptation and continuous literacy development.

Public Service Digitalization and Administrative Efficiency

The implementation of digital governance has also affected administrative efficiency and public service delivery across the study areas. Regions with stronger technological integration demonstrate faster service processing and higher citizen satisfaction levels.

Table 6. Public Service Digitalization Indicators

Indicators	Kendari	Kolaka	Buton
Integrated Public Service Applications	27	14	6
Administrative Processing Time Reduction (%)	43	26	11
Population Administration Processed Online (%)	74.5	49.3	22.6
Online Licensing Applications (%)	68.7	44.1	18.2
Citizen Satisfaction with Digital Services (%)	81.4	63.5	39.7

Source: Regional Public Service Reports and SPBE Monitoring Data, 2024.

Kendari demonstrates the highest level of administrative efficiency due to integrated digital systems and coordinated governance structures. Kolaka has begun implementing online administrative integration, although interoperability remains partial. Buton continues relying heavily on manual procedures because digital systems remain fragmented and unstable.

An IT officer from Kendari explained:

> *"Integrated public service systems significantly reduce administrative delays. Before digital integration, residents often had to visit several offices just to complete one document. Now many verification processes happen automatically because agency databases are already connected through the city server system."* (Participant KDI-06, Government IT Division)

A civil service officer from Buton stated:

> *"Digital applications exist, but many residents still come directly to the office because they do not trust the online process completely. Technical disruptions also happen frequently, especially during network outages. As a result, manual administration is still considered more reliable by many people."* (Participant BTN-12, Civil Administration Office)

These findings strengthen the argument that administrative digitalization must be supported by stable infrastructure, institutional coordination, and public trust to achieve effective governance outcomes.

Discussion

Institutional Capacity and Technological Readiness in Digital Governance

The findings demonstrate that institutional capacity and technological readiness constitute the primary foundations for the development of inclusive Digital Public Infrastructure (DPI) in Southeast Sulawesi. The qualitative analysis reveals that variations in governance readiness across Kendari, Kolaka, and Buton are strongly influenced by differences in institutional coordination, administrative capability, infrastructure quality, and political commitment. These factors collectively determine the effectiveness of digital transformation initiatives and the sustainability of governance reform processes.

Kendari exhibits the highest level of institutional maturity among the three research locations. The city government has established integrated coordination mechanisms, interconnected digital systems, and dedicated governance structures to support SPBE implementation. Strong political leadership also contributes to administrative consistency and policy continuity (Huque & Ferdous, 2019; Shawoo et al., 2023; Van et al., 2019). The existence of centralized monitoring systems enables local agencies to synchronize administrative services and accelerate public service delivery. These findings support Painter & Pierre (2004) institutional capacity theory, which emphasizes that governance effectiveness depends on organizational coherence, administrative capability, and policy integration. The high SPBE performance scores achieved by Kendari further confirm that institutional stability and coordinated governance significantly strengthen digital transformation outcomes.

The findings also indicate that technological integration plays a central role in improving administrative efficiency (Madaki et al., 2024; AlMulhim, 2023; Akram et al., 2022). Kendari has successfully implemented interoperable systems connecting population administration, licensing services, and regional data management platforms. This integration reduces administrative duplication, accelerates verification processes, and increases service responsiveness. The findings align with OECD perspectives on digital governance, which emphasize that interoperability strengthens transparency, accountability, and institutional efficiency. In contrast, Kolaka and Buton continue facing fragmented system development because many digital platforms operate independently without standardized integration frameworks. Several agencies still rely on manual coordination, resulting in administrative inefficiency and inconsistent public service delivery.

Infrastructure inequality further influences governance performance across the research sites. Statistical data indicate that Kendari possesses stronger internet penetration, broader 4G

coverage, and more stable digital infrastructure than Kolaka and Buton. Rural areas in Buton continue experiencing unstable network access and limited digital facilities, restricting citizen access to online governance platforms. These conditions support Grimes (2003) argument that peripheral regions often experience structural disadvantages in digital infrastructure development due to geographical limitations and unequal investment distribution. According to Hafel (2023) the field observations confirm that unstable internet connectivity frequently disrupts administrative processes and reduces public trust in digital services.

Leadership commitment also emerged as a decisive factor shaping digital governance sustainability. In Kendari, digital transformation is positioned as part of bureaucratic reform rather than merely technological modernization. Political support from local leadership strengthens institutional discipline, budget allocation, and cross-agency collaboration. Lim argues that stable leadership vision is essential for sustaining digital governance transformation because institutional adaptation requires long-term administrative commitment. The present findings support this argument, particularly when compared with Buton, where leadership inconsistency frequently disrupts policy continuity and delays digital governance implementation.

Interagency collaboration further contributes to institutional resilience and governance adaptability (Elston, T., & Bel, 2023; Sonesson et al., 2021). The collaboration between planning agencies, ICT offices, and regional institutions in Kolaka demonstrates how shared coordination mechanisms improve policy implementation and public service integration. Collaborative governance arrangements facilitate technical support, data sharing, and institutional learning processes. These findings correspond with Sørensen & Torfing (2018) collaborative governance framework, which highlights the importance of cross-sector cooperation in strengthening public sector innovation. In Buton, however, institutional silos continue limiting coordination capacity and weakening administrative resilience during technical disruptions.

The findings collectively demonstrate that digital governance development in Southeast Sulawesi depends not only on technological investment but also on institutional adaptation, governance coordination, and political commitment. Regions with stronger administrative structures and integrated governance systems are more capable of institutionalizing inclusive digital transformation, while weaker institutional environments continue facing fragmentation, inefficiency, and limited technological sustainability.

Inclusivity, Citizen Participation, and Social Adaptation

The second major dimension identified in this study concerns inclusivity, citizen participation, and socio-cultural adaptation within digital governance implementation. The findings reveal that digital transformation in Southeast Sulawesi remains unevenly distributed across social groups and geographical areas. Although local governments have expanded online public services, participation in digital governance platforms is still strongly influenced by digital literacy, infrastructure accessibility, socio-economic conditions, and public trust toward government institutions.

The study found that citizen participation in digital governance is considerably higher in Kendari compared to Kolaka and Buton. Yue et al. (2019) and Rodríguez-Hevía et al. (2020) said that, urban communities, civil servants, students, and younger populations demonstrate stronger engagement with online public services because they possess better digital literacy and more reliable internet access. Participatory platforms allowing residents to submit complaints, access information, and monitor public services have increased administrative responsiveness in Kendari. These findings support Ansell and Torfing's perspective that inclusive governance requires participatory mechanisms capable of strengthening interaction between citizens and public institutions.

Despite these developments, inclusivity challenges remain substantial in rural and marginalized communities. Many residents in Buton continue preferring manual administrative procedures because they distrust online systems and experience difficulties accessing digital platforms. Concerns regarding data errors, unstable networks, and bureaucratic reliability reduce community confidence in digital governance systems. The findings demonstrate that digital

transformation cannot succeed solely through technological expansion without simultaneously addressing issues of institutional trust and community adaptation.

Digital literacy emerged as one of the most important determinants of citizen participation. The findings indicate that regions implementing continuous literacy programs experience greater community engagement with digital public services (Pade-Khene, 2018; Chohan & Hu, 2022). In Kolaka, collaborations between universities, local governments, and civil society organizations have improved digital competency among women, youth groups, and rural residents. Training programs focusing on practical mentoring approaches have increased citizens' confidence in using online administrative systems, healthcare services, and social assistance platforms. These findings reinforce Madon and Sahay's argument that digital inclusion requires social learning processes that enable communities to adapt to technological change gradually.

The study also reveals significant gender disparities in digital participation. Women in rural areas frequently face structural barriers related to smartphone ownership, internet access, and technological confidence. Many female participants reported relying on younger family members when accessing online public services. Cultural norms and economic limitations further reduce women's opportunities to participate independently in digital governance processes. These findings indicate that digital governance initiatives risk reproducing existing social inequalities when inclusivity policies fail to address socio-cultural constraints directly (Zamani & Rousaki, 2024; Pandey & Zheng, 2023).

The role of non-governmental actors also appears highly significant in strengthening inclusivity. Universities, community organizations, and local digital literacy initiatives function as intermediary institutions connecting communities with government services. Collaborative literacy programs implemented in Kolaka illustrate how community-based initiatives can strengthen public engagement and reduce technological exclusion. Sørensen & Torfing (2018) describe this condition as collaborative public value creation, where governance effectiveness emerges through shared institutional participation between state and non-state actors.

Public trust additionally shapes the sustainability of inclusive digital governance. Communities that perceive digital services as transparent, responsive, and reliable demonstrate higher willingness to engage with online systems. Kendari has attempted to strengthen public confidence through transparency dashboards and integrated monitoring systems that improve accountability visibility. Hartanto et al. (2021) argues that transparency mechanisms increase legitimacy and strengthen citizen trust within digital governance systems. The present findings support this perspective by showing that regions with stronger transparency mechanisms experience higher levels of citizen participation and administrative acceptance.

The findings collectively demonstrate that inclusive Digital Public Infrastructure requires more than technological availability. Sustainable digital governance depends on the interaction between literacy development, social adaptation, institutional trust, and collaborative participation mechanisms. Regions with stronger institutional coordination and community empowerment programs are more capable of ensuring equitable digital participation, while areas with limited infrastructure and weak social support systems continue facing exclusionary governance patterns.

CONCLUSION

The development of inclusive Digital Public Infrastructure (DPI) in Southeast Sulawesi is strongly influenced by the interaction between institutional capacity, technological readiness, leadership commitment, and social inclusivity. Kendari shows relatively advanced digital governance performance due to integrated administrative systems, stable political support, and stronger infrastructure availability, while Kolaka and Buton continue facing institutional fragmentation, limited interoperability, and unequal digital access. The findings also reveal that digital inclusivity remains constrained by low digital literacy, infrastructure disparities, and socio-cultural barriers, particularly among rural communities and marginalized groups. Collaborative initiatives involving local governments, universities, and civil society organizations contribute positively to strengthening citizen participation and digital adaptation. The study confirms that sustainable digital governance cannot rely solely on technological expansion but requires institutional reform,

participatory governance mechanisms, and equitable capacity development to ensure that digital transformation supports both governance effectiveness and social equity in peripheral regions of Indonesia.

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