Research Article

From Digital Exclusion to Adaptive Inclusion: Policy Innovations to Bridge Social Divides in Next-generation Regional Planning in Indonesia

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Abstract.

This study examines the impact of Indonesia's digital transformation policies on regional social equity, with a focus on disparities between the Western and Eastern regions. Utilizing a comparative methodology with quantitative and qualitative data from government assessments, including the electronic-based government system (SPBE) and Indonesia Digital Society Index (IMDI) from 2022 to 2024, the research identifies spatial, institutional, and policy disparities. The analysis revealed persistent regional digital divides, with Western Indonesia consistently outperforming Eastern Indonesia in both digital readiness and citizen capacity. A positive correlation between IMDI and SPBE scores indicates that societal digital readiness and e-government maturity evolve in tandem. However, these advancements have not equally benefited all regions. The observed digital gaps reflect deeper structural inequalities, necessitating policy innovation for inclusive development. The findings underscore the importance of adaptive, context-specific interventions that align community empowerment with bureaucratic modernization. This study recommends asymmetric, capacity-building programs, performance-based digital equity grants, and the establishment of Regional Digital Transformation Zones (RDTZs) to bridge the digital equity gap and promote inclusive digital transformation in Indonesia.

Keywords: digital transformation, social equity, regional development, e-government, policy innovation

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1. Introduction

Indonesia, the largest economy in Southeast Asia and the world's fourth most populous nation, is undergoing a rapid and complex transformation process. As of 2024, Indonesia's population has reached over 281 million, with nearly 69% of individuals connected to the internet and more than 99% having access to electricity (CIA World Factbook, 2024). Simultaneously, urbanization is accelerating, with projections indicating that 68% of the population will reside in urban areas by 2025. This demographic shift presents significant opportunities and challenges for national and regional development. Indonesia's diverse cultural landscape, comprising over 300 ethnic groups, further complicates

efforts to design equitable development policies that effectively address regional disparities. In the digital era, the integration of technology into public governance, services, and community engagement is no longer optional—it is a requisite for inclusive and sustainable development.

The emergence of digital governance models and policy frameworks has become increasingly central to Indonesia's development strategy, particularly under initiatives such as the "100 Smart City Movement" and the Electronic-Based Government System (SPBE). With the enactment of multiple presidential regulations, such as President Regulation Number 95 year 2018, Number 132 year 2022, and Number 82 year 2023, Indonesia has institutionalised a nationwide commitment to digital transformation. These regulatory frameworks, supported by the pedomanMenteri PAN-RB Number 3 year 2024, aim to enhance policy coherence, institutional performance, and citizen engagement through digitally mediated governance. The SPBE model, drawing from international standards such as the Capability Maturity Model (CMM) and its integration framework CMMI, marks a significant evolution toward more adaptive and mature digital governance. Consequently, Indonesia's rise to a "Very High" category in the 2024 E-Government Development Index (VHEGDI) underscores its progress, while simultaneously revealing persistent gaps in ensuring digital equity and regional inclusivity.

The academic literature reflects growing interest in the intersection of digital transformation, policy innovation, and social equity. [1] emphasizes the transformative capacity of state-led digital initiatives to foster collaborative governance mechanisms that prioritize sustainability and inclusivity. This perspective is echoed in research on digital capacity in education by Timotheou et al. (2022), who highlight the role of digital literacy in mitigating social disparities and empowering marginalized groups. The recognition that digital transformation can democratize access to services underscores its potential in regional planning. However, equitable outcomes are not guaranteed without deliberate policy interventions that address the root causes of exclusion.

Policy frameworks for digital inclusion have become a focal point in development studies. [2] explores the nuances of e-government adoption in developing contexts, emphasizing that issues such as privacy, data security, and user trust significantly influence digital governance outcomes. [3] advance this discussion by linking digital transformation with performance improvements in key sectors, such as energy, and positing that strategic policy design is essential to achieving broader sustainability targets. In the Indonesian context, such insights hold particular relevance, as the integration of digital tools into regional planning processes must consider both infrastructural

capabilities and socio- political dynamics. Furthermore, the Indonesian Digital Society Index (IMDI), modelled on the G20 Toolkit for Measuring Digital Skills, introduces a multidimensional framework based on infrastructure, digital skills, empowerment, and employment, signalling a more holistic approach to adaptive inclusion.

Yet, despite these advances, significant regional and social disparities remain. The research by [4] calls for reconfiguring social impact assessments to prioritize resilience and inclusion in regional development. They argue that digital governance must be reoriented to account for local knowledge, values, and socio-economic contexts—particularly in heterogeneous societies such as Indonesia. Similarly, [5] demonstrate how municipalities can proactively integrate community input and adapt to environmental risks in urban planning, an approach that resonates with Indonesia's need for decentralized, participatory policy- making. [6] demonstrate how inclusive public spaces foster social trust, thereby providing a valuable conceptual link between spatial planning and digital inclusion.

Despite such contributions, the core research problem persists: how can Indonesia's digital transformation efforts be recalibrated to genuinely bridge social divides and ensure adaptive inclusion across its diverse regions? Existing literature acknowledges the potential of digital tools to enhance governance and service delivery but falls short of offering comprehensive frameworks that align technological innovation with social equity in the context of regional planning. The challenge lies in ensuring that digital governance mechanisms are not only technically robust but also socially responsive and regionally adaptable.

Several studies propose general solutions, predominantly focusing on the development of policy instruments and institutional reforms that promote digital accessibility and citizen engagement. For example, national-level initiatives such as SPBE are designed to standardize digital services across government agencies and regions, thereby enhancing administrative efficiency and transparency. The incorporation of maturity models like CMMI into SPBE governance structures allows for the systematic monitoring of digital capability progress. However, while these models provide a blueprint for digital system integration, they do not fully address the sociocultural and economic variances that shape digital adoption and impact at the local level. Similarly, frameworks such as the IMDI serve as useful diagnostic tools but require further operationalization to guide inclusive policy interventions.

A more targeted body of literature delves into specific solutions, emphasizing participatory digital governance and community-led innovation. For instance, [3] propose adaptive policy mechanisms that account for evolving public administration dynamics, particularly in contexts marked by institutional fragmentation and demographic complexity. These recommendations are particularly pertinent to Indonesia, where regional autonomy presents both opportunities and challenges for policy harmonization. Other researchers, such as[4], advocate for the institutionalization of social impact assessments within digital policy frameworks, arguing that inclusive development hinges on context- sensitive evaluations of community needs and vulnerabilities. These perspectives suggest that adaptive inclusion—defined as the capacity to integrate diverse social groups into digital governance processes through responsive and participatory policies—requires both top-down frameworks and bottom-up engagement strategies.

Closely related research further underscores the importance of integrating social equity into urban and regional planning frameworks. Studies on stakeholder engagement in municipal governance [5] and on the role of public spaces in fostering inclusion [6] highlight the necessity of multidimensional strategies that transcend technological considerations. These studies support the premise that policy innovations must be both spatially and socially grounded.

In the Indonesian context, there are emerging yet underdeveloped attempts to bridge institutional and citizen-oriented digital policy assessments. The IMDI framework and the SPBE maturity model both provide tools for evaluating digital progress, but they are rarely analyzed in conjunction to assess their combined impact on regional disparities. There is also limited empirical work that correlates policy implementation at the provincial level with measurable social equity outcomes. As a result, a significant research gap exists in integrating these policy frameworks to assess their effectiveness in reducing digital exclusion and promoting adaptive inclusion, particularly between Eastern and Western Indonesia.

This study contributes to the evolving discourse by providing a comprehensive, macro-level analysis of how SPBE policies have impacted digital equity across Indonesia's provinces between 2022 and 2024. It does so by synthesizing institutional and community-based digital performance indicators and evaluating interregional disparities through a spatial equity lens. In doing so, the study responds to calls for more integrative, evidence-based assessments of digital governance that reflect the complexities of diverse and decentralized national contexts. The novelty of this study lies in its dual integration of macro policy frameworks and spatial analytics

2. Literature Review

2.1. Urban and Regional Planning Perspectives

Urban and regional planning has long been recognized as a vehicle for promoting social equity through coordinated interventions across spatial, economic, and social domains. Regional planning is a strategic process designed to enhance the quality of life and promote sustainable development across urban and rural areas, often by integrating land use, transportation, housing, and public services[7][8]. The relationship between regional planning and social equity is profound. Integrative policies can align educational, health, and housing agendas to address underserved populations [9]. Improvements in transportation infrastructure can enhance access to services and employment, particularly benefiting low-income populations [10]. Community engagement practices embedded in planning processes empower marginalized voices, ensuring policy responsiveness [8]. Furthermore, regional planning can mitigate environmental injustices by equitably distributing green spaces and pollution burdens [10]. Addressing housing affordability through inclusive housing strategies ensures spatial justice and supports social mobility [11]. As [5] and [6] note, climate-resilient urban planning that includes participatory mechanisms enhances both environmental sustainability and social inclusiveness.

2.2. Policy Innovation as a Mechanism for Equity

Policy innovation is increasingly essential in adapting governance structures to the demands of a rapidly changing world. It refers to the introduction of new ideas, processes, or tools that enable more effective and inclusive policy responses to complex challenges [12]. The COVID-19 pandemic highlighted the need for innovation in public administration, necessitating adaptable mechanisms for healthcare and service delivery[13]. A central component of policy innovation is stakeholder integration, which promotes inclusivity and enhances the legitimacy of policies [14][15]. Conceptual innovations involve redefining policy goals in line with emerging challenges such as social equity and environmental sustainability [3]. Procedural innovations emphazise collaborative governance and participatory mechanisms, while technological innovations utilise digital tools for efficient service delivery [16]. As noted by [17], technology-driven policy innovations can enhance government responsiveness and accountability. These

innovations must be embedded in adaptive frameworks that evolve in response to societal needs, particularly in dynamic settings where social conditions change rapidly [18].

2.3. Social Equity: Concepts and Indicators

Social equity has become an increasingly focal point in academic discourse and policy development. It is commonly defined as the just distribution of resources, opportunities, and privileges, aiming to ensure that all individuals, regardless of socioeconomic status, background, or demographic characteristics—enjoy equal access to societal benefits [19]. Social equity transcends formal equality by addressing historical injustices and structural disparities that inhibit full societal participation. To operationalize social equity, scholars have identified several key indicators. Economic indicators such as income distribution and employment rates are frequently employed to assess disparities in access to financial resources, with tools like the Gini coefficient serving as widely accepted measures. Health indicators encompass disparities in access to healthcare services and outcomes, linking inequities to broader social determinants, such as housing and education. In the realm of education, disparities in enrollment, graduation rates, and resource availability reveal systemic inequalities that hinder educational equity. Environmental indicators have gained prominence through the lens of environmental justice, examining the unequal exposure to environmental hazards among marginalized populations [20][21]Social connectivity indicators measure community engagement, political representation, and institutional inclusivity, serving as a proxy for the social capital necessary for equitable governance. A multidimensional approach to social equity, leveraging these indicators, enables policymakers to address complex and interrelated issues of disparity. [3] underscore the importance of comprehensive policy frameworks in the digital age, particularly in heterogeneous societies like Indonesia, where digital divides mirror existing social fractures.

2.4. Digital Transformation and Social Equity

Digital transformation significantly influences the structure and delivery of public services, reshaping access to economic, educational, and healthcare opportunities. This transformation can enhance social equity by improving service accessibility, fostering economic mobility, and supporting inclusive governance models. [1] argues that policy

innovations must be leveraged through strategic state interventions to ensure digital technologies contribute to sustainability and equity. Digital governance, when appropriately implemented, facilitates transparency, participation, and accountability Similarly, [22] highlight that investment in digital literacy and educational capacity-building is fundamental to reducing digital and social divides. Moreover, digital transformation is reshaping public service delivery and economic opportunity structures. [23] assert, digital platforms are instrumental in expanding access to healthcare, education, and employment, thereby supporting broader social inclusion. When digital reforms are aligned with inclusive governance principles, they can significantly enhance economic mobility and societal well-being.

2.5. Policy Frameworks for Digital Inclusion and Community Resilience Achieving digital inclusion requires policy frameworks that are both

context-sensitive and adaptable to the diverse needs of various populations. In developing countries, challenges such as low digital literacy, infrastructure gaps, and institutional fragmentation necessitate tailored strategies for equitable digital governance. [2] emphasizes the importance of ensuring privacy and security in digital services as a foundational element for building trust, particularly among first-time users or vulnerable populations. Without secure platforms, digital transformation risks reinforcing exclusion rather than alleviating it. Complementarily, [3] advocate for cross-sectoral collaboration and localized policy adaptations to advance sustainability and resilience. Their study emphasizes that digital equity cannot be achieved in isolation; it must be integrated into broader socio-economic planning and community resilience frameworks. [4] extend this argument by calling for redesigned social impact assessments that reflect local capacities and aspirations. Participatory governance and inclusive planning processes, they argue, are essential for ensuring that digital governance initiatives respond effectively to community needs. [3] further support this view, highlighting the role of evolving public administration theories in guiding equitable policy development in digital contexts. In the Indonesian context, digital governance initiatives such as SPBE and IMDI aim to create standardized performance indicators for government agencies and communities. While SPBE provides a structured model for evaluating institutional digital maturity, IMDI focuses on the digital capabilities of citizens across four dimensions: infrastructure, digital skills, empowerment, and employment. However,

the implementation of these frameworks has often been compartmentalized, limiting their combined potential to reduce the digital divide.

2.6. Research Gaps and Justification for this Study

Despite the comprehensive frameworks developed for digital governance, significant gaps persist in their integration and regional application. First, existing research often treats institutional digital readiness and citizen digital literacy as separate domains, leading to fragmented policy assessments. This is evident in Indonesia, where Kemen-PANRB evaluates institutional performance (SPBE), and Kominfo assesses citizen capacity (IMDI), without a unified analytical framework. Second, most empirical studies remain at the national level, overlooking spatial disparities within countries, particularly in geographically complex nations like Indonesia. There is a pressing need to assess how digital governance initiatives perform across provinces and how these patterns reflect broader issues of regional inequality. Third, limited research has been conducted on the interaction effects of multiple digital policy instruments. Understanding how SPBE and IMDI influence one another—and whether they collectively contribute to digital equity—is crucial for designing more effective regional policies. This study addresses these gaps by providing a provincial-level analysis of SPBE performance across Indonesia from 2022 to 2024, using IMDI as a complementary measure of citizen capacity. The findings aim to inform integrated policy development that bridges digital and regional disparities, ultimately supporting adaptive inclusion and social equity in the context of next-generation regional planning in Indonesia.

3. Methods

This study employs an exploratory, comparative methodology to investigate the impact of Indonesia's digital transformation policies on regional social equity, with a particular focus on interregional disparities between the Western and Eastern parts of the country. This methodological approach is chosen to capture macro-level patterns of digital exclusion and inclusion using secondary data analysis. The goal is to construct a foundational understanding that can inform future research at sub-provincial levels, including urban and municipal scales. The methodology is designed in alignment with current scholarly calls for integrated digital policy evaluation frameworks [2][3].

3.1. Research Design and Analytical Framework

The research design is grounded in qualitative and quantitative comparative analysis, applying a meta-analytical approach to synthesize data from multiple authoritative government sources. The comparative lens facilitates the identification of spatial, institutional, and policy disparities that contribute to digital inequities across provinces. Drawing on the Capability Maturity Model Integration (CMMI) framework adopted in Indonesia's SPBE (Electronic-Based Government System) policy, the study evaluates the institutional maturity and service delivery readiness across provincial governments. In line with digital transformation literature [16] the methodology is structured to examine both governance inputs (e.g., infrastructure, policy adoption) and outcomes (e.g., digital literacy, citizen engagement). It integrates theoretical perspectives from digital governance, public policy innovation, and regional planning to provide a multi-scalar lens of analysis.

3.2. Data Sources

Primary data sources for this study include two government-commissioned assessments conducted in 2024. The first is the "Laporan Evaluasi Sistem Pemerintahan Berbasis Elektronik (SPBE) 2024" produced by the Ministry of Administrative and Bureaucratic Reform (KemenPANRB), which offers standardized evaluations of digital governance implementation across all Indonesian provinces. The second major source is the "Indeks Masyarakat Digital Indonesia (IMDI) 2024," published by the Ministry of Communication and Informatics (Kemenkominfo), which provides metrics on digital literacy, infrastructure, empowerment, and employment across provinces. These indices are aligned with the G20 Toolkit for Measuring Digital Skills and Digital Literacy and thus offer internationally comparable indicators. Additional data are drawn from national statistics provided by Badan Pusat Statistik (Statistics Indonesia), including population density, urbanization rates, GDP per capita, and regional infrastructure development indices. Complementary international datasets are accessed through repositories such as the World Bank and the International Telecommunication Union (ITU), offering comparative metrics on connectivity, digital service usage, and human capital development.

3.3. Data Preparation and Coding

All datasets were cleaned, normalized, and geocoded to facilitate provincial-level comparative analysis. Variables such as digital infrastructure readiness, digital skill acquisition, policy compliance levels, and public service digitization scores were coded using a standardized rubric derived from CMMI maturity levels. This coding enabled the alignment of dissimilar datasets into a coherent analytical framework. Each province was treated as a case unit. Index scores from the SPBE evaluation and IMDI were imported into a data management system and merged using unique provincial codes. To manage and process the datasets, Python and R were used, complemented by machine learning-supported software (RapidMiner and Orange) for clustering and pattern recognition tasks. These tools enabled a structured analysis of correlations and divergences between the two indices, providing robust insights into interregional gaps.

3.4. Meta-Analysis and Analytical Procedures

A meta-analytical approach was employed to synthesize data and findings across different reports and indices. This involved a comparative analysis of SPBE and IMDI scores to identify correlations between government digital readiness and public digital capability. The goal was to discern whether high institutional digital maturity corresponded with higher levels of societal digital inclusion, as theorized by [1]. Cluster analysis techniques were employed to categorize provinces into typologies based on their relative performance in SPBE and IMDI indices. Hierarchical clustering with Ward's method and K-means clustering were used to segment provinces into groups exhibiting similar digital maturity patterns. This step was crucial for identifying provinces with high institutional readiness but low societal inclusion and vice versa. To quantify disparities, the study employed Gini coefficients and Theil indices to measure digital inequality across provinces. These measures were chosen for their robustness in assessing inequality in multidimensional datasets. Additionally, cross-tabulation and regression analyses were conducted to explore the relationships between digital infrastructure availability, governance quality, and social outcomes.

3.5. Theoretical Grounding and Policy Integration

The methodological approach is grounded in the conceptual framework that combines digital governance theory, regional equity models, and public policy innovation literature [9]. The study draws on Imperiale and Vanclay's (2023) framework of community resilience and adaptive governance to understand how digital policy interventions can enhance inclusive development. Policy innovation is operationalized following [15] emphasis on stakeholder integration and procedural redesign, which is especially relevant in Indonesia's multi-level governance context. This methodological integration supports a comprehensive understanding of how regional planning and policy structures interact with digital transformation initiatives. It positions the analysis to inform actionable recommendations for targeted policy interventions in areas lagging in either governance or community readiness.

3.6. Validy, Reability, and Limitations

To ensure reliability and validity, triangulation was conducted by comparing government reports with open-source datasets. Cross-validation was applied during clustering to prevent overfitting. Furthermore, inter-rater reliability was ensured by having independent analysts code the policy documents using the standardized rubric. Despite these precautions, several limitations exist. The use of secondary data constrains the analysis to the scope and quality of existing datasets. Provincial-level aggregation may obscure intra-provincial disparities, which are critical for urban-scale planning. Moreover, the absence of longitudinal data limits the ability to infer causal relationships or temporal changes.

3.7. Ethical Consideration

As this study relies solely on publicly available secondary data, no direct ethical risks to human subjects are present. However, ethical research principles were followed in data sourcing, ensuring transparency and proper citation. Software tools were used in accordance with licensing agreements, and all data interpretations were conducted with academic integrity. In summary, the methodology presented in this study combines rigorous comparative analysis with a meta-analytical framework to evaluate the interplay between digital governance and social equity at the provincial level in Indonesia.

This approach is designed to be replicable, scalable, and adaptable for future studies exploring digital transformation at more granular spatial scales.

4. Results and Discussion

This study addresses the core research question of whether the Electronic-Based Government System (SPBE) initiative in Indonesia has contributed to enhancing social equity through digital inclusion, particularly between the Western and Eastern regions of the country. By integrating data from the Indonesia Digital Society Index (IMDI) and the SPBE evaluation results (2022–2024), this study confirms that while measurable progress has been made, significant regional disparities remain. The analysis not only validates previous research highlighting uneven regional development in Indonesia [3] but also offers novel empirical insights into the extent and trajectory of digital inclusion efforts at the macro-regional level.

4.1. Regional Disparities in Digital Readiness and E-Governance

The analysis of the IMDI and SPBE data reveals that, although improvements occurred nationwide, disparities between Western and Eastern Indonesia persist. As shown in Figure 1, the Western Region achieved an average IMDI score of 61.6 in 2024, while the Eastern Region recorded a significantly lower average of 53.0. Likewise, the normalized SPBE scores followed a similar trend, with Western Indonesia scoring 56.4 and Eastern Indonesia lagging at 49.8 (Figure 1). These findings are consistent with literature emphasizing historical infrastructural gaps and governance asymmetries between the regions [24].

This regional disparity aligns with prior research noting uneven digital development across Indonesian provinces, rooted in long-standing structural, infrastructural, and institutional asymmetries [3]. These patterns also align with the structural disparities identified by [1] who notes that policy innovations alone cannot overcome long- standing institutional and economic imbalances unless accompanied by equitable resource allocation. The Western Region, including provinces such as DKI Jakarta, West Java, and Yogyakarta, demonstrates more mature digital ecosystems. These regions exhibit higher digital literacy, better ICT infrastructure, and more advanced e-governance capabilities. In contrast, the Eastern Region—including Papua, Maluku, and East Nusa Tenggara—continues to face infrastructural constraints and limited access to

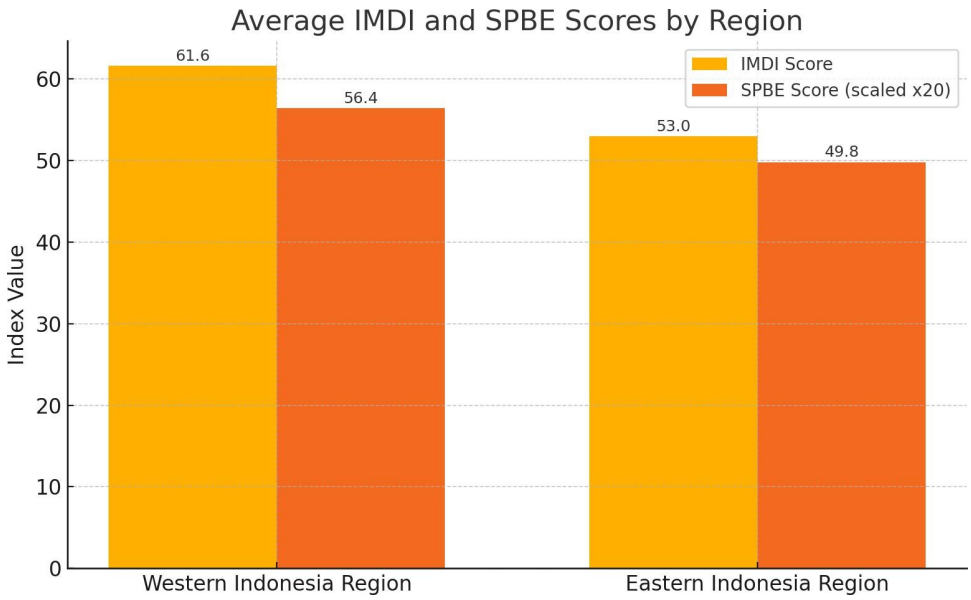

Figure 1: Average IMDI and SPBE Scores by Region.

quality digital services [24] and human capital necessary for effective digital participation (Figure 2) [8].

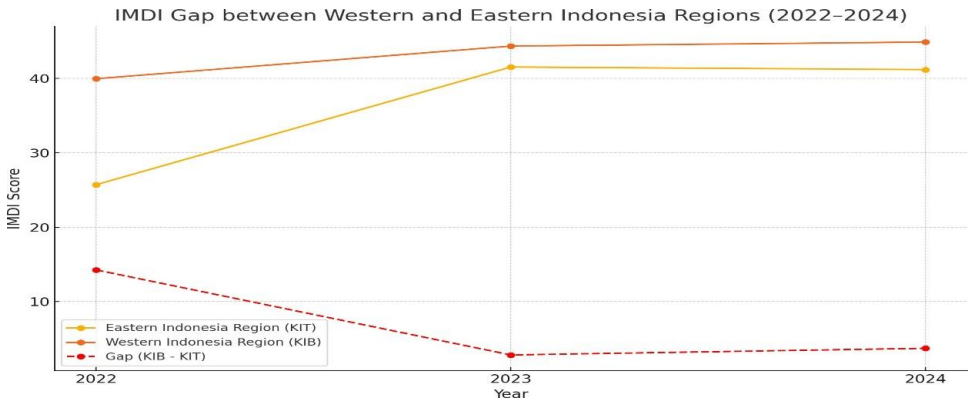

Figure 2: IMDI gap between the Western and Eastern regions, 2022 to 2023.

4.2. Correlation Between Digital Society and E-Government Readiness

A positive correlation exists between the IMDI and SPBE scores at the provincial level, supporting the proposition that societal digital readiness and e-government maturity evolve in tandem. As illustrated in Figure 3, provinces with higher IMDI scores generally exhibit superior SPBE performance, indicating that the digital competencies of citizens influence and are reinforced by digital governance mechanisms. This dual-progress

trend affirms assertions by [2] who emphasised the interdependence between digital infrastructure, digital literacy, and effective e-government systems.

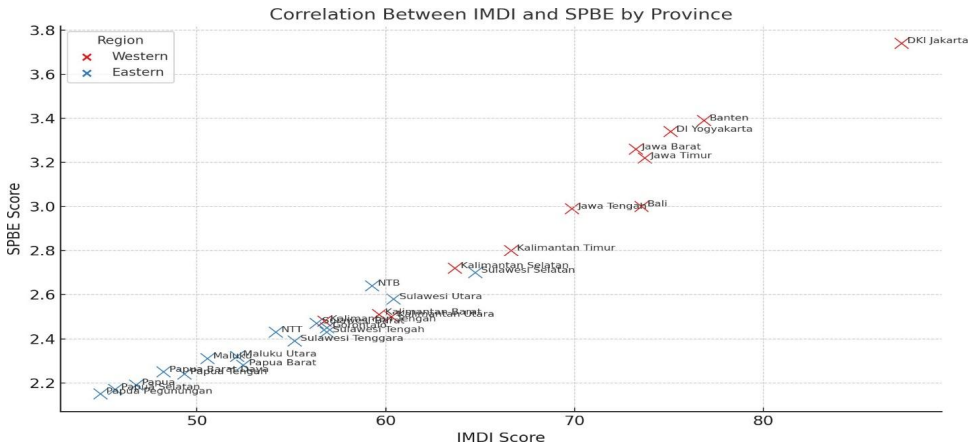

Figure 3: Correlation Between IMDI and SPBE by Province.

This finding reinforces existing literature emphasizing the mutual reinforcement between public digital literacy and administrative digital transformation [1]. A digitally literate populace tends to engage more effectively with e-government platforms, thereby encouraging governments to improve the quality of their digital services. Conversely, regions with low IMDI scores, like Papua and Maluku, exhibit correspondingly low SPBE outcomes, indicating intertwined deficiencies in both societal and bureaucratic digital capacities.The correlation also supports Androniceanu and Georgescu's (2023) assertion that digital governance initiatives are more likely to succeed when a robust digital society is in place to help them. This reinforces the methodological stance adopted in this study, which holds that integrative frameworks—combining policy, technology, and community resilience—are vital for achieving equitable digital transformation.

4.3. Provincial Trends in Digital Inclusion

The slope chart analysis demonstrates notable improvements in IMDI scores between 2022 and 2024 across selected provinces. Several provinces in Eastern Indonesia—such as East Nusa Tenggara and North Maluku—recorded substantial gains, indicating targeted policy impacts. However, the Western Region still dominates the top five in overall IMDI improvements (see Figure 4). This reflects a more accelerated pace of digital adoption due to pre-existing infrastructural and institutional advantages.

The observed provincial gains underscore the importance of localized policy innovation. Context-specific policy designs are critical to overcoming localized barriers to

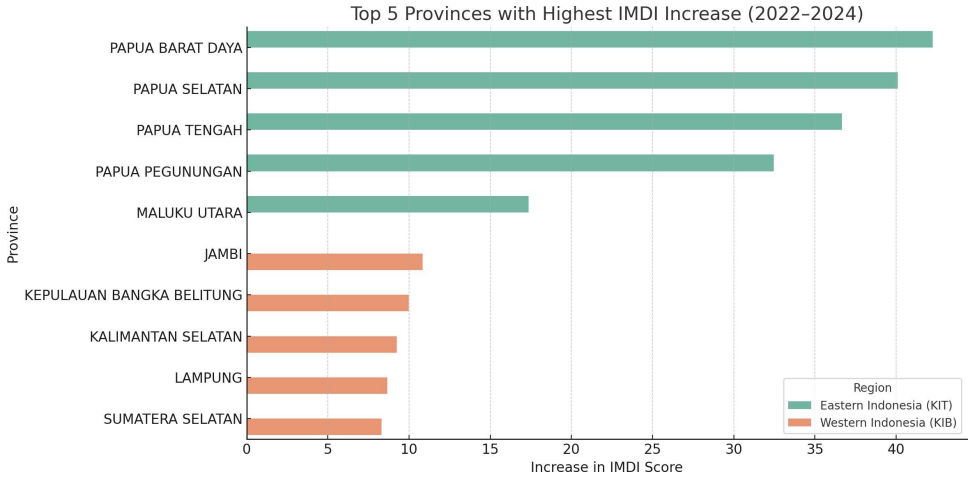

Figure 4: Top 5 Provinces with Highest IMDI Improvement (2022–2024).

digital equity. Policy innovation, when embedded in adaptive frameworks, enables governments to deploy tailored interventions—ranging from capacity- building programs to infrastructural investments—that directly respond to regional needs [18].

4.4. Heatmap Analysis: Spatial and Temporal Variation

The IMDI heatmap (Figure 5) offers a granular view of spatial and temporal changes in digital inclusion. Western Indonesia exhibits consistent performance across most provinces, while Eastern Indonesia displays sporadic improvements. This spatial variation supports [9] argument that integrative planning policies must consider spatial equity to ensure that underserved regions receive adequate support

The heatmap also reinforces the argument made by [6] regarding the role of community-level digital spaces—akin to urban parks—in fostering communal engagement and trust. In regions where digital infrastructure is limited, community access points such as libraries or community internet centers may play a critical role in catalyzing digital literacy and inclusion.

4.5. Middle-Spectrum Provinces as Regional Accelerators

A noteworthy observation involves provinces like East Kalimantan and South Sulawesi. These provinces do not fit neatly into the dichotomy of Western advancement and Eastern lag. Instead, they represent middle-spectrum regions with moderate IMDI and SPBE scores, suggesting emerging digital maturity. These provinces could serve as strategic accelerators or “digital bridges” for less developed regions. This idea aligns

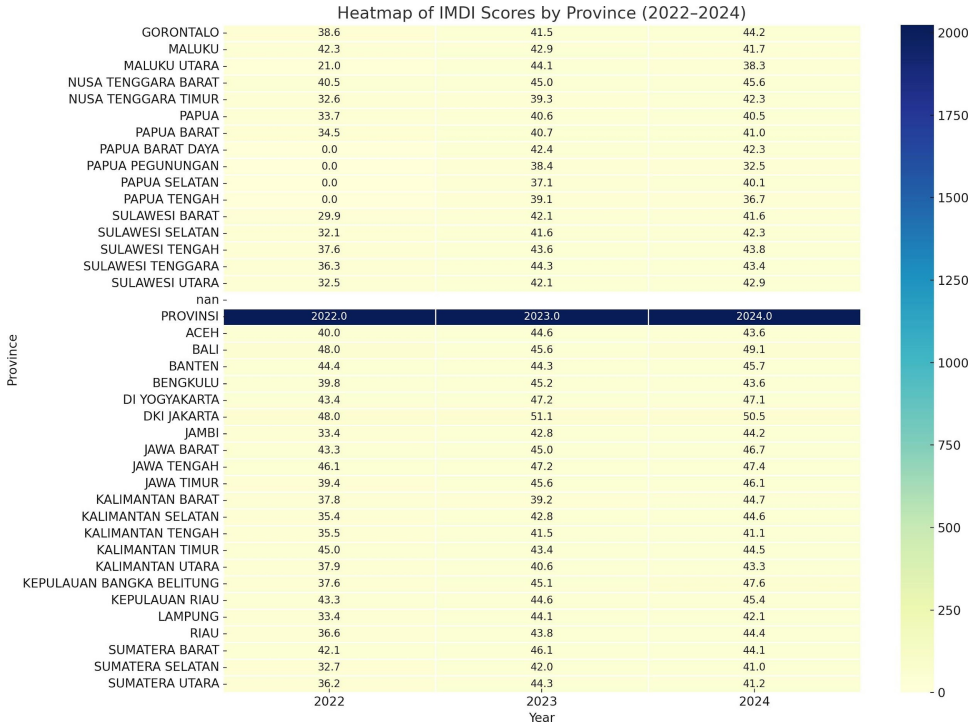

Figure 5: IMDI Heatmap by Province (2022–2024).

with [4] recommendation that participatory digital strategies in semi-developed regions can yield scalable models. By leveraging existing capacities and community engagement mechanisms, middle-spectrum provinces could become regional hubs for digital literacy, SPBE pilot programs, and innovation incubators. Their relative advancement, coupled with geographic proximity to underdeveloped areas, presents a unique opportunity to foster regional equity through targeted interventions.

4.6. Digital Gaps and Structural Inequality

The observed digital divide reflects deeper structural inequalities. Western Indonesia's superior performance in both IMDI and SPBE metrics is not merely a function of administrative competence but a consequence of cumulative advantages in infrastructure, education, and socioeconomic development [19] These structural advantages translate into greater ease in adopting digital platforms and public service innovation. In contrast, Eastern Indonesia grapples with persistent underinvestment in digital infrastructure and human capital. The region's limited access to stable internet, insufficient ICT training programs, and low literacy levels present significant barriers to SPBE implementation [2]. This reinforces the findings of[9], who argue that digital transformation cannot be detached from broader social equity issues. Digital policy, therefore, must operate

within a context-sensitive and equity- focused framework. This report presents the development of the Indonesian Basic Capital Index (IMDI) in Western and Eastern Indonesia from 2022 to 2024. It includes comparative regional trends, top-performing provinces, and visual analyses to highlight progress and disparities across provinces.

4.7. Implications for Policy Innovation and Regional Planning

The empirical findings substantiate the importance of policy innovation as a mechanism for promoting digital equity. As emphasized by [16]technological innovations in governance must be supported by procedural and conceptual innovations that ensure inclusivity. Stakeholder integration, as advocated by Akimov and Kadysheva (2023), is particularly crucial in regions where trust in government and institutional engagement is historically weak. Furthermore, the findings align with the notion that digital transformation reshapes access to essential services— education, health, and employment—thereby influencing long-term regional equity [23]. The gains in Eastern Indonesia demonstrate that strategic interventions can reverse systemic exclusion, though sustained efforts are required to match the pace of digital advancement in the West. The findings also indicate the necessity for an asymmetric policy approach to digital transformation in Indonesia. Uniform national strategies risk overlooking regional disparities in digital readiness and administrative capacity. Instead, differentiated interventions, tailored to regional needs and existing capacities, are essential. For instance, while the Western Region could focus on advanced digital governance innovation—such as AI-driven public services or smart city applications—the Eastern Region requires foundational investments in infrastructure, digital literacy, and institutional capacity [11]. These findings align with the recommendations of [6] who advocate for regional planning frameworks that incorporate localized needs into national digital strategies. Similarly, the concept of anticipatory governance [18] underscores the importance of adapting policy instruments to evolving regional conditions. In this light, Indonesia's digital equity agenda should emphasize adaptive and segmented policymaking.

4.8. Significance and Strategic Recommendations

The results of this study contribute new insights into the intersection of digital society development and government digital transformation. The evidence supports a shift toward holistic, place-based digital strategies that align community empowerment with

bureaucratic modernization. It confirms that digital transformation is most effective when governments invest simultaneously in technological infrastructure, digital literacy, and participatory governance [3] This study contributes to the theoretical discourse on adaptive inclusion in regional planning by demonstrating how digital transformation, mediated by targeted policy innovations, can narrow structural divides. It extends the work of [4] who proposed community resilience frameworks informed by digital governance. The strong relationship between IMDI and SPBE adds empirical validation to the idea that social and digital systems are co-evolutionary in nature. Moreover, this study bridges sectoral policy silos by integrating e-government and digital literacy assessments into a single analytical framework, offering a model for future urban-scale studies. It complements the arguments made by [1] that educational capacity is a determinant of digital equity, suggesting that regions with stronger human capital bases are better equipped to harness digital governance. Furthermore, the potential role of middle-spectrum provinces as regional accelerators represents a novel contribution to the literature. By fostering these provinces as model regions, national authorities can generate scalable practices that uplift lagging areas. This approach resonates with the principles of resilience and social equity advocated by[4], whereby community-based innovations form the backbone of equitable digital development. Overall, the research objectives were achieved. The analysis confirmed the strong interdependence between IMDI and SPBE performance, mapped regional disparities with empirical clarity, and identified strategic leverage points for policy intervention. While exceptions—such as the relative progress of NTB and NTT—require further exploration, they point to the efficacy of targeted digital acceleration programs.

4.9. Limitations and Future Research Directions

While this study achieves its primary objective of mapping regional digital disparities through macro-level analysis, it is limited by its aggregate focus on provinces. Sub-provincial (urban and rural district-level) analysis is essential to uncover more nuanced patterns of exclusion and inclusion. The use of AI-assisted meta-analysis offers computational advantages but may obscure qualitative contextual variations. Future studies should incorporate participatory research and mixed-methods approaches to enhance interpretive depth. Additionally, as the SPBE and IMDI frameworks evolve, longitudinal studies beyond 2024 will be critical to capturing the enduring impacts of policy

interventions. Integrating environmental sustainability metrics and social vulnerability indices could further enrich the framework for inclusive digital transformation.

5. Conclusion

This study demonstrates that digital transformation in Indonesia is characterized by clear regional asymmetries, with Western provinces consistently outperforming their Eastern counterparts in both the Indonesia Digital Society Index (IMDI) and the Electronic-Based Government System (SPBE) evaluation. The positive correlation between IMDI and SPBE scores substantiates the interdependence of societal digital readiness and bureaucratic digital maturity. Notably, provinces such as DKI Jakarta and West Java lead in both indices, benefiting from cumulative infrastructural and institutional advantages, while Eastern regions such as Papua and Maluku face systemic barriers, including limited ICT infrastructure and insufficient digital literacy. One of the study's major contributions lies in identifying middle-spectrum provinces—such as South Sulawesi and East Kalimantan—as potential accelerators of equitable digital development. These provinces represent a strategic middle ground and offer replicable models for inclusive governance and digital innovation. This insight introduces a valuable nuance to the digital divide discourse by proposing spatially differentiated development pathways. The implications are profound for policy design. Uniform national digital policies risk exacerbating inequality unless they are recalibrated to reflect regional capacities and constraints. Therefore, an asymmetric, equity-focused framework is critical. The findings affirm that digital transformation is not only a matter of technology deployment but also one of social inclusion, institutional alignment, and place-based policy responsiveness. Future research should further investigate the mechanisms enabling middle-tier provinces to act as regional hubs and explore longitudinal impacts of digital acceleration initiatives to refine the trajectory toward inclusive and sustainable digital governance The research contributes to the existing literature by integrating policy analysis with empirical digital readiness indicators, thereby offering a macro-level perspective on the intersection between digital governance and social equity. By analyzing public datasets and applying meta-analytical methods, the study bridges fragmented governmental insights and presents a holistic view of digital inclusion. Importantly, this research advances the discourse on policy innovation as a critical tool for adaptive inclusion, particularly in complex archipelagic nations like Indonesia, where geographic and infrastructural asymmetries challenge uniform policy implementation. A critical

insight from this research is the positive correlation between digital society readiness and e-government performance. This alignment suggests that advancing one dimension can reinforce the other. Accordingly, bridging the digital divide must be pursued through comprehensive policy innovation strategies that address both citizen empowerment and institutional capability. Innovative policies should prioritize context-sensitive frameworks, acknowledging the diverse geographic, cultural, and administrative conditions across Indonesian provinces. Adaptive policy tools, including regulatory sandboxes and iterative planning models, can foster experimentation while ensuring local relevance. Operationally, the government should deploy multi-level, cross-sectoral actions such as: (1) expanding digital infrastructure in remote areas through public-private partnerships; (2) integrating digital literacy into national education curricula with local language adaptations; (3) establishing regional digital equity task forces to monitor and respond to disparities in real time; and (4) enhancing inter-ministerial data interoperability to coordinate digital inclusion programs. Ultimately, this research contributes a strategic framework for adaptive inclusion, emphasizing that technological diffusion alone is insufficient. Social equity in the digital era depends on institutional agility, stakeholder integration, and the political will to operationalize innovation where it is needed most. Future studies should explore the impact of these adaptive strategies at the urban and community scales to ensure lasting digital justice.

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