



AI-Driven Governance and the Transformation of Central-Local Authority in Indonesia

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Abstract

Digital transformation through the use of Artificial Intelligence (AI) in governance is growing in Indonesia, triggering significant changes in the dynamics of power relations between the central and regional governments. While AI has the potential to improve the efficiency of public services and strengthen state capacity, disparities in digital capacity across regions pose significant challenges in its implementation. This study aims to analyze the impact of AI use on the configuration of authority and central-regional relations in Indonesia. The research methodology is a qualitative analysis using secondary data sources from national policy documents, local government reports, academic articles, and credible media, processed and analyzed using NVivo 12. Data were obtained from four major cities, including Jakarta, Bandung, Makassar, and Jayapura, representing varying levels of digital readiness and local challenges. The findings indicate that AI reinforces centralization and reconfigures power relations with a pattern of recentralization, through centrally controlled algorithmic standards and data interoperability. Variations in implementation indicate that local capacity and infrastructure are determinants of the success and influence of AI in local governance. This study makes a theoretical contribution by developing a framework for authority transformation in the context of digitalization in developing countries and offering empirical insights into the dynamics of central-regional relations in the AI era. In addition, this study recommends strategies for increasing institutional capacity and inclusive regulatory oversight to ensure sustainable and equitable AI implementation.

Keywords: Artificial Intelligence (AI), Central-Local Authority, Digital Governance, Public Service Transformation, Algorithmic governance.

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Introduction

Indonesia is entering a new phase of governance, with the widespread use of Artificial Intelligence (AI) in various state functions, from public services and development planning to fiscal oversight. The central government is promoting digitalization through SPBE, the Electronic-Based Government System, which is now integrating AI modules for predictive analytics, automated decision support, and real-time monitoring. Meanwhile, local governments face widely varying levels of bureaucratic capacity, infrastructure, and readiness. This imbalance is creating new patterns of interaction between the central and local governments, particularly when standardized national algorithms influence local discretion in policy planning and implementation (Jaya et al., 2024; Wadipalapa et al., 2024). Therefore, AI-based digital transformation is not merely a technical issue, but has become a factor that changes the power relations between the central and regional governments. To more clearly illustrate the disparity in digital readiness that underlies the variation in AI adoption between regions, the development of the national ICT Development Index (IP-TIK) can be presented as a macro indicator of Indonesia's digital capacity (see Figure 1).



Figure 1. Indonesia's ICT Development Index (IP-TIK) per year. **Source:** (Statistic Indonesia, 2024).

Based on Figure 1, there are variations in the trend of increasing IP-ICT nationally that are not evenly distributed across regions, indicating significant gaps in digital infrastructure and capabilities that ultimately affect the extent to which local governments are able to respond to the central government's push to adopt AI technology (Jaya et al., 2024; Wadipalapa et al., 2024). Practically, a number of AI initiatives, such as the use of machine learning for extreme poverty detection, stunting early warning systems, mobility analytics for smart cities, and AI in regional fiscal governance, indicate that the central government is increasingly playing a role in designing analytical frameworks and data standards that regions must follow (Wadipalapa et al., 2024). This has implications for a shift in the locus of authority, where decisions that were previously contextual-local are now increasingly supported by algorithmic recommendations controlled by the center or national

vendors. This dynamic ultimately forms a new configuration of central-regional relations, where digital capacity and regional capabilities in adapting technology become determining factors for the extent of local discretion (Judijanto et al., 2023). The adoption of AI not only engineers bureaucratic processes, but also gradually constructs new patterns of power that reveal a tendency toward technocratic centralization while opening up opportunities for differentiation in autonomy based on the digital readiness of each region.

As a more concrete illustration, cross-regional comparisons show that AI-based transformation is taking place under conditions of highly unequal capacity. Jakarta and Bandung, for example, have developed digital ecosystems and data infrastructure that enable more autonomous algorithmic integration (Surya et al., 2021; Wadipalapa et al., 2024), so that AI not only supports the implementation of national policies but also expands the scope for innovation by local governments. Makassar is in the middle, with fairly massive technology adoption but still dependent on national platforms and technical support from the central government (Hardi et al., 2025). In contrast, Jayapura shows a much higher level of dependency, both in terms of infrastructure and bureaucratic competence (Hilmawan et al., 2023). This variation shows that the adoption of AI is not only a matter of technology, but also a process that produces new differentiations in central-regional relations, depending on the digital readiness and institutional capabilities of each region. These differences become even more apparent when the digital readiness gap between Jakarta and Jayapura is visualized in Figure 2, which illustrates the structural distance in ICT infrastructure and capacity (see figure 2).



Figure 2. digital readiness disparity in Indonesia. **Source:** (Statistic Indonesia, 2024).

Based on Figure 2, it can be seen that the digital divide between Jakarta and Jayapura is not only quantitative in nature, but also reflects institutional limitations that directly shape the scope of AI adoption at the regional level. Theoretically, this shift challenges the classical framework of central-regional relations, which is usually analyzed through the concepts of decentralization, multilevel governance, and intergovernmental relations. AI introduces a new dimension in the form of algorithmic governance, which is a decision-making mechanism that is automated through computational models (Gritsenko & Wood, 2022). The literature shows that algorithms can create asymmetrical power relations through control over data, model standardization, and technocratic authority that is not always transparent (Katzenbach & Ulbricht, 2019; Micheli et al., 2020). Therefore, the central-regional relationship in the AI era needs to be understood through a new

perspective that combines digital centralization, data sovereignty, and algorithmic authority, thereby enabling a more comprehensive analysis of the transformation of power across levels of government.

Previous research highlights that AI tends to strengthen the capacity of states in surveillance and cross-regional coordination (Albous et al., 2025; Wadipalapa et al., 2024) improving the efficiency of public services (Wadipalapa et al., 2024) and establish data-driven national standards that can reduce local variation (van Noordt et al., 2025). On the other hand, several studies show that regions with high digital capacity are able to utilize AI to expand innovation and increase policy autonomy (Clim (Moga) et al., 2025). However, specialized literature on how AI affects central-regional power dynamics in developing countries, including Indonesia, is still limited. Most studies focus more on technology adoption rather than its political implications. This gap opens up space for this study.

This study aims to examine how the use of AI in governance changes the configuration of authority between the central and regional governments in Indonesia. Specifically, this study analyzes whether AI strengthens centralization, creates hybrid governance, or enables the re-localization of authority through increased regional digital capacity. The urgency of this research lies in the fact that the adoption of AI is developing faster than the establishment of adequate regulatory, ethical, and governance frameworks. Without an understanding of its impact on central-regional relations, Indonesia has the potential to face governance imbalances, algorithmic bias, and technocratic domination that could weaken the principle of regional autonomy.

Objectives

This study aims to analyze the shift in authority and the dynamics of the relationship between the central and regional governments as a consequence of the application of Artificial Intelligence (AI) in public services in Indonesia. In the first part, this study will identify the forms and levels of AI implementation in public services in several cities, with Jakarta as a representative of a city with mature digital infrastructure, Bandung as a city with strong local innovation, Makassar as a city with medium digital capacity, and Jayapura as a region with significant digital gap challenges. In the second part, this study will evaluate the governance implications of AI implementation, including the level of decision automation, national algorithmic standards, and the discretion of local governments in providing public services. In the final part, this study will analyze how differences in AI implementation at the local level affect shifts in central-regional relations, particularly in terms of changes in control, authority, and decision-making capacity.

Research Methods

Reserch design

This study uses an exploratory qualitative case study design (Creswell, 2007; Creswell & Poth, 2016) that is entirely based on secondary data because the focus of the study lies on interpreting institutional dynamics and digital governance that have been well documented through various credible sources. This approach is relevant for analyzing the transformation of central-regional authority in the era of Artificial Intelligence (AI)-based public services, given that these changes are widely recorded in national regulations, policy documents, evaluation reports, and academic publications that can be used as valid empirical material in qualitative research. The use of secondary data is also important to strengthen data triangulation, thereby increasing the credibility and validity of research findings. In addition, this method allows for tracing the mechanisms and causal relationships between digital innovation, changes in decision-making processes, and their impact on central-regional power relations.

The analysis was conducted in four cities with contrasting characteristics to capture the variation in AI implementation in public services. Jakarta was chosen as a representative of a region with the most mature digital infrastructure and the highest level of integration with national systems, Bandung was chosen for its strong local digital innovation and supporting human resource capacity, Makassar represents a city with medium digital capacity and gradual adaptation to AI systems, while Jayapura was chosen to illustrate a context with significant digital capacity constraints and infrastructure gaps. Based on the frameworks of digital governance, algorithmic bureaucracy, and multi-level governance, this study examines how differences in technological capacity, institutional quality, and central-regional coordination mechanisms shape variations in AI implementation and influence the discretion of local governments. This approach aims to reveal how different local contexts produce uneven changes in central-regional authority, as well as open up opportunities for more adaptive governance innovation in the era of AI-based governance.

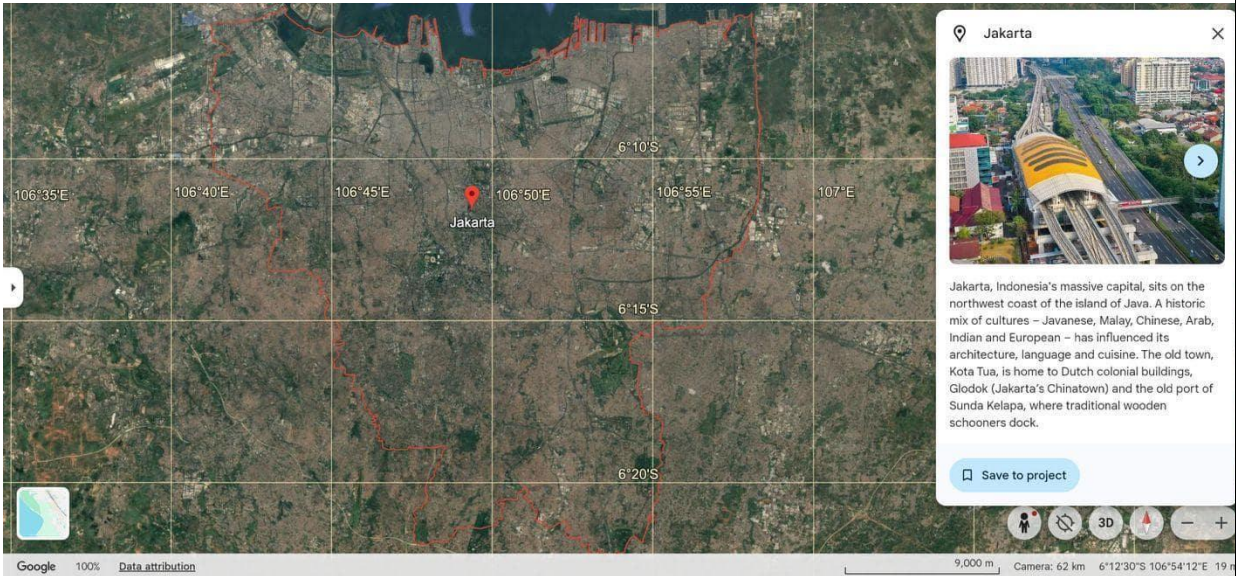
This study uses secondary data sources published in the last six years (2019–2025), including indexed journal articles, government regulations, national policy documents, reports from government and credible media investigations into the application of AI in public services. Inclusion criteria include: (1) sources that provide empirical data or analysis related to the implementation of AI in public services, digital governance, or the dynamics of central-regional relations in the four study areas; and (2) documents originating from reputable institutions or relevant experts. Exclusion criteria include: (1) documents without clear sources or methodologies, and (2) public opinions or advocacy materials that lack analytical depth.

Research site

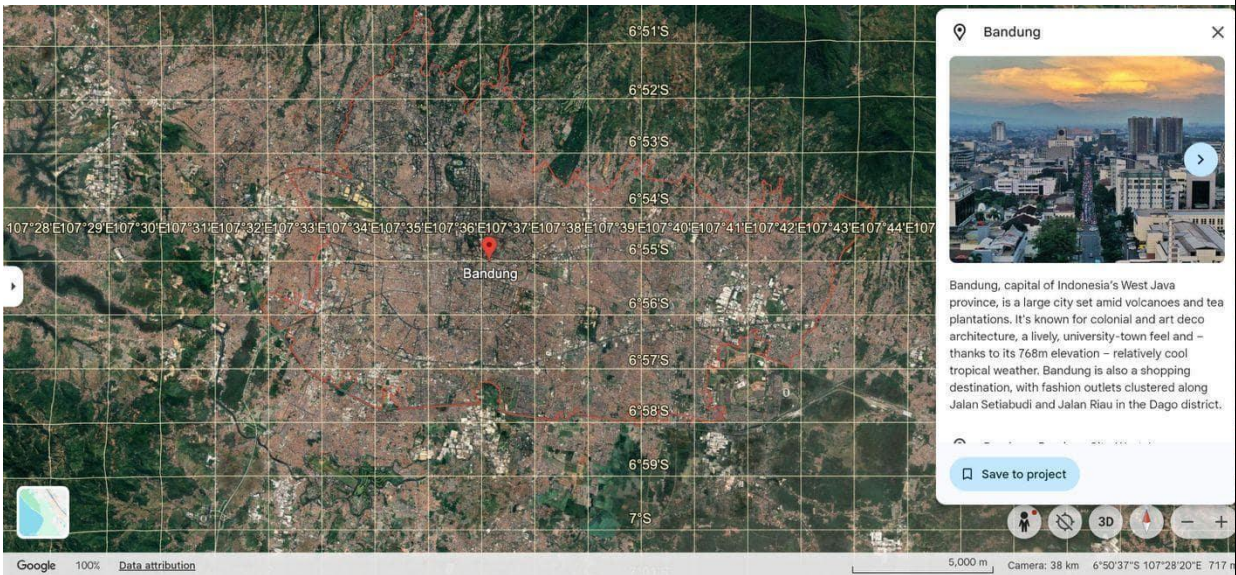
This study focuses on four cities in Indonesia that show striking differences in the dynamics of Artificial Intelligence (AI) implementation in public services and its implications for central-regional authority relations, namely Jakarta, Bandung, Makassar, and the Jayapura. Jakarta (index ICT score 7.88) represents the region with the most mature digital ecosystem, established technological infrastructure, and the highest level of integration with national systems and algorithms, thus demonstrating a strong pattern of digital centralization. Bandung (index ICT score 6.33) illustrates a different model with rapidly developing local innovation through the development of AI applications and systems designed by the city government, offering a unique interaction between central standards and regional creativity. Meanwhile, Makassar (index ICT score 3.64) reflects a context of medium digital capacity, where AI adoption is managed gradually and depends on institutional readiness, showing a hybrid pattern between the center and the regions. Jayapura (index ICT score 3.22), highlights structural challenges such as digital infrastructure gaps, limited technology access, and uneven institutional capacity, revealing a context where national algorithm dominance is far stronger than local discretion (Statistic Indonesia, 2024).

These regional differences provide an important context for understanding how variations in technological capacity, governance quality, and local socioeconomic conditions influence the distribution of authority in AI-based public services. These variations also provide opportunities to identify how regions with different conditions respond to algorithmic standardization pressures from the center, and the extent to which they are able to innovate or become increasingly centralized in decision-making.

Jakarta, Indonesia



Bandung, Indonesia



Makassar, Indonesia



Figure 3. Research site selection: several regions in Indonesia (Jakarta, Bandung, Makassar, and Jayapura). **Source:** Google Earth, 2025.

Based on Figure 3, data analysis in this study was directed at identifying patterns linking the level of AI implementation, digital infrastructure readiness, and changes in authority between central and regional governments in four study areas, namely Jakarta, Bandung, Makassar, and Jayapura. A qualitative content analysis approach was used through a process of data reduction, categorization, and thematic interpretation to explore how variations in regional digital capacity shape their roles, discretion, and dependence on national algorithmic standards. This analysis not only maps the forms of AI adoption in public services but also examines the extent to which this technology shifts policy control mechanisms from the local to the central level.

To ensure the reliability of the findings, this study applied several validation strategies: (1) source verification, by matching data from SPBE documents, local government reports, academic publications, and national regulations related to AI; (2) methodological triangulation, through a combination of cross-case analysis, policy document tracing, and synthesis of secondary findings; and (3) theoretical triangulation, by reading data using a digital governance framework, decentralization theory, and the concept of algorithmic centralization. This approach ensures consistency in the analytical process and reduces potential interpretation bias. In terms of representativeness, data selection was carried out proportionally to illustrate the variations in conditions across the four study areas, including Jakarta as the region with the most advanced digital infrastructure, Bandung as a local innovator, Makassar as a region with medium capacity, and Jayapura as the region with the largest digital gap. This proportionality allows the study to capture different dynamics in the application of AI, particularly in relation to service automation, distribution of authority, and changes in the discretion of local governments. Referring to the criteria of credibility, dependability, and confirmability from Lincoln and Guba (1985), transparency in data selection and analysis procedures ensures that the findings reflect relevant empirical realities, rather than isolated case narratives. Thus, the entire analysis process reinforces the reliability and contribution of this research in explaining how AI drives the transformation of central-regional relations in public service governance in Indonesia.

Data collection

This study employed document analysis and qualitative synthesis to collect and integrate information from multiple secondary sources. The data consisted of 3 foundational methodological texts, 30 peer-reviewed and online scientific articles on AI adoption and governance in Indonesia and internationally, 6 mass media reports, and 5 institutional reports from regional and national governments. These materials were selected based on their credibility, empirical relevance to AI-driven governance, and analytical depth in examining the transformation of central–local authority relations in Indonesia. Table 1 provides detailed information on the data sources used in this study (see Table 1).

Table 1. Data collection and data sources.

No.	Data Resources	References	Brief Relevance	Data Category
1.	Government Documents and Website	Makassar City Government. (2022). <i>Operation Room (War Room) Report</i> . https://makassarkota.go.id	These sources show how regional AI adoption and readiness shape central–local authority dynamics in Indonesia.	Government documents
		Makassar City Government. (2024). <i>Smart City Evaluation Report 2024</i> . https://makassarkota.go.id		
		Regional Development Planning Agency (Bappeda) of Makassar City. (2024). <i>Ranperda RPJPD 2025–2045</i> . https://makassarkota.go.id/		
		Papua Provincial Government. (2025). <i>Papua Digital Infrastructure Readiness Report</i> . https://papua.go.id/		
		Statistics Indonesia. (2024). <i>ICT Development Index 2024</i> . https://bps.go.id		
2.	Books	Creswell, J. W. (2007). <i>Qualitative Inquiry and Research Design</i> . Sage Publication Inc.	These sources provide methodological guidance for designing and conducting qualitative research to analyze AI-driven governance and	Methodology
		Creswell, J. W., & Poth, C. N. (2016). <i>Qualitative inquiry and research design: Choosing among five approaches</i> . Sage publications.		

Denzin, N. K., & Lincoln, Y. S. (2018). *The SAGE handbook of qualitative research (5th ed.)*. Sage publications

central–local authority dynamics in Indonesia.

		<p>Wadipalapa, R., Nurmandi, A., Kristiadi, J. B., & Purnomo, E. P. (2024). <i>Artificial intelligence policy in Indonesian</i></p> <p>Pratiwi, A., Rahmawyanet, M. E., Wibowo, P. A., & Sensuse, D. I. (2024). <i>Systematic literature review on artificial intelligence in Indonesia's public sector: Reimagining digital government</i>. <i>JITK (Jurnal Ilmu Pengetahuan dan Teknologi Komputer</i>, 11(2).* https://doi.org/10.33480/jitk.v11i2.6842</p> <p>Gati, R. A., Rizki, M., & Posumah, R. Y. (2021). <i>Readiness of artificial intelligence to accelerate bureaucratic reform in Indonesia</i>. <i>MAP Observer: Jurnal Penelitian Administrasi Publik</i>, 1(2), 1–23. https://doi.org/10.30996/mapo.v1i1.5606</p> <p>Didin, D., Haedar, A. W., & Aliah, N. (2024). <i>Artificial intelligence–based public services in the digital era in Indonesia</i>. <i>PINISI Discretion Review</i>. https://doi.org/10.26858/pdr.v8i1.67972</p> <p>Kesuma, A. A., Yulianto, A. S., & Dwi, S. (2023). <i>E-Government as a form of smart governance implementation at Bandung Smart City</i>. <i>Jurnal Indonesia Sosial Teknologi</i>, 4(12), 2469–2480. https://doi.org/10.59141/jist.v4i12.831</p> <p>Hastuti, H. (2025). <i>Strategies for implementing digital governance for Smart City development in Makassar City</i>. <i>Asian Digital Governance Problems</i>, 2(1), 35–45. https://doi.org/10.71435/639136</p> <p>Zuiderwijk, A., Chen, Y.-C., & Salem, F. (2021). <i>Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda</i>. <i>Government Information Quarterly</i>, 38(3), 101577. https://doi.org/10.1016/j.giq.2021.101577</p> <p>van Noordt, C., & Misuraca, G. (2022). <i>Artificial intelligence for the public sector: Results of landscaping the use of AI in government across the European Union</i>. <i>Government Information Quarterly</i>. https://doi.org/10.1016/j.giq.2022.101714</p> <p>Wicaksono, J. A., Widodo, A. P., & Adi, K. (2025). <i>AI governance: Understanding how public organizations implement it</i>. <i>Government Information Quarterly</i>, 42(1), 102003. https://doi.org/10.1016/j.giq.2024.102003</p> <p>Hardianto, T., Mustafa, M., Suleman, Y., Mubarak, M. N. A., & Triadi, F. (2025). <i>Digital transformation in public administration: Challenges and opportunities in the age of AI and Big Data</i>. <i>Pinisi Business Administration Review</i>, 7(1). https://doi.org/10.26858/pbar.v7i1.71546</p>	
3.	Previous Study	<p>These studies provide empirical and conceptual insights into AI adoption, policy, and digital governance in Indonesia, highlighting how AI shapes public sector reform, smart city initiatives, and central–local authority dynamics.</p>	Research article
4.	Media	<p>Alhamidi, R. (2025, October 22). Bandung trials AI-Based traffic lights. <i>Detik.com</i>.</p>	<p>These news articles illustrate real-world</p>

- <https://www.detik.com/jabar/berita/d-8172529/bandung-uji-coba-lampu-lalu-lintas-berbasis-ai>
- Aurellia, A. (2023, August 28). Take a peek at the latest sophisticated features and technology at the Bandung Command Center. *Detik.com*. <https://www.detik.com/jabar/berita/d-6898995/intip-kecanggihan-fitur-dan-teknologi-terbaru-di-bandung-command-center>
- Bogiarto, W. (2025, August 14). Jakarta Accelerates to Build a Data- and AI-Based Smart City. *Republik Merdeka*. <https://rmol.id/teknologi/read/2025/08/14/676152/jakarta-tancap-gas-bangun-smart-city-berbasis-data-dan-ai>
- Junida, A. I. (2024, December 10). Jakarta Satu implements AI to support its vision of becoming a global city. *Antara News*. <https://www.antaraneews.com/berita/4522471/jakarta-satu-implementasikan-ai-dukung-visi-jadi-kota-global>
- Primananda, R. J. (2025, November 12). The Traffic Corps installed 200 CCTV cameras integrated with smart cities in Bandung. *Antara News*. <https://www.antaraneews.com/berita/5237221/korlantas-pasang-200-cctv-terintegrasi-dengan-smart-city-di-bandung>
- Putri, L. M. (2025, June 11). Jakarta is already using AI to monitor and handle traffic jams. *Antara News*. <https://www.antaraneews.com/berita/4891877/jakarta-sudah-gunakan-ai-untuk-pantau-dan-tangani-macet>
- Regional Development Planning Agency (Bappeda) of Makassar City. (2024, August 6). Zulkifly Nanda admits AI implementation is included in Makassar City's RPJPD to promote digital transformation. *Regional Development Planning Agency (Bappeda) of Makassar City*. <https://bappeda.makassarkota.go.id/dorong-transformasi-digital-zulkifly-nanda-akui-penerapan-ai-masuk-dalam-dalam-rpjpd-kota-makassar/>

applications of AI in Indonesian cities, showing how Jakarta and Bandung use AI for traffic management, crowd monitoring, and cross-sector data integration, highlighting differences in scale and local implementation capacity.

Source: processed from various sources, 2025.

Data analysis

Qualitative data analysis in this study was conducted using NVivo 12 Plus (Woolf & Braveman, 2011), which serves to organize, code, and map thematic patterns from secondary data sources related to the application of artificial intelligence in public services. All documents, including national digital transformation policies, technical regulations for the public service sector, reports from the local governments of Jakarta, Bandung, Makassar, and Jayapura, as well as academic literatures (2019–2025), were imported into NVivo and underwent an initial data cleaning process to ensure consistency. Coding was carried out in stages with a structure of three main nodes: (1) Governance Conditions and Institutional Capacity, (2) Dynamics of AI Implementation in Public Services, and (3) Shifts in Central-Regional Authority Relations. Each node has sub-nodes such as infrastructure readiness, data integration, changes in service procedures, the role of local actors, and central policy

instruments. This hierarchical structure allows for systematic thematic analysis and cross-regional comparisons to understand variations in implementation and institutional responses to AI technology.

The node comparison, matrix coding, and NVivo visualization features were then used to explore the relationship between local capacity, central government intervention, and the impact of AI implementation on the dynamics of authority. Project visualization helped illustrate how national digital instruments (e.g., Satu Data, SPBE, and national interoperability architecture) reshaped the scope of local government in the delivery of public services. To maintain the reliability of the analysis, this study applied iterative refinement procedures, including codebook updates, peer evaluation, and coding consistency checks using coding comparison tools. This approach ensures transparency, repeatability, and stability of interpretation (Denzin & Lincoln, 2018), so that the findings can validly represent the center-region dynamics in AI-based governance in Indonesia.

Results and Discussion

Empirical Mapping of AI Deployment Across Indonesian Urban Governance Systems

To understand how artificial intelligence is beginning to reshape governance in Indonesia, an important first step is to map the actual conditions of AI implementation at the city level. Each city has different digital capacities, development visions, and administrative pressures, so the patterns of AI adoption are not uniform. Therefore, this section presents an empirical overview of how AI is applied in the delivery of public services in four cities that represent various characteristics of urban governance in Indonesia, namely Jakarta, Bandung, Makassar, and Jayapura. This mapping serves as a basis for examining how variations in local conditions can influence the transformation of the relationship between central and regional authorities in the era of AI-based governance (see Table 2).

Table 2. Empirical Mapping of AI Deployment Across Indonesian Urban Governance Systems. Source: Proceeded by researcher, 2025.

Cities	AI Implementation in Public Services	Systems/Programs	Empirical Evidence of AI Use	Key Challenges
Jakarta	Extensive implementation in smart city systems, mobility management, and administrative services (Solihati & Indriyani, 2021).	JAKI, CCTV Intelligent Surveillance, AI Traffic Control (Putri, 2025; Wadipalapa et al., 2024)	Jakarta is recorded as having the most mature AI ecosystem in Indonesia, with cross-sector data integration and the use of AI in daily operational decision-making (Bogiarto, 2025; Junida, 2024).	Cross-agency data integration, data security, and dependence on vendors (Wadipalapa et al., 2024).
Bandung	Use of AI in data-driven public services and citizen complaint systems (Sofyan, 2024)	LAPOR!, Bandung Command Center, limited face recognition in public areas (Aurellia, 2023; Sofyan, 2024)	Bandung uses AI for analyzing citizen reports and detecting crowd density, though its scale remains more limited compared to Jakarta (Alhamidi, 2025; Primananda, 2025).	Budget constraints and limited technical human resource capacity (Haetami, 2025)
Makassar	Adoption of AI through sensor-based public service	War Room Makassar, e-Government Sensor Systems (Makassar City)	Makassar has a strong record of digital innovation; AI is used for area	Digital infrastructure

innovations and administrative automation (Yusriadi et al., 2023) **Government, 2022; Yusriadi et al., 2023)** monitoring and rapid response (Makassar City Government, 2024; Regional Development Planning Agency (Bappeda) of Makassar City, 2024). **remains uneven (Yusriadi et al., 2023)**

Jayapuraa	AI use is very limited and is largely facilitated by central government programs (Chairuddin et al., 2024)	One Data Indonesia, basic service automation applications (Chairuddin et al., 2024; Papua Regional Daevelopment Planning Agency, 2021)	AI implementation is driven more by central initiatives than local ones; its use is limited to verifying social assistance data and basic administrative tasks (papua.go.id, 2025).	Infrastructure gaps, low digital literacy, and high dependence on the central government (Butarbutar, 2025).
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Based on Table 2, empirical mapping shows that variations in the level of AI implementation in the four cities are not merely differences in technical capacity, but reflect a slowly shifting structure of authority. Jakarta, with the most mature AI ecosystem, shows how cities with high capacity are able to build new, relatively autonomous agencies that utilize AI for administrative decision-making. However, this condition also marks the emergence of a new pattern of interdependence, for example the more sophisticated the AI system, the greater the city's need for standardized national datasets controlled by the center (e.g., population data, socioeconomic registration, and mobility data) (Wadipalapa et al., 2024). Bandung and Makassar exhibit a Middle pattern, where both adopt AI to improve service responsiveness but remain highly dependent on centrally determined regulations, standards, and interoperability. This means that AI adoption not only strengthens local capacity but also expands the scope of central control through algorithmic standardization and data protocols (Hardi et al., 2025).

In the case of Jayapura, infrastructure and human resource limitations mean that AI implementation is almost entirely driven by the central government through the national program. This represents the most extreme form of recentralization-through-technology, where the center no longer extends its authority through administrative instructions, but rather through digital systems that make automatic decisions based on national algorithms (Shoesmith et al., 2020). These findings show that variations in AI adoption actually widen the gap in authority between cities with high capacity to create new spaces for innovation, while disadvantaged regions become increasingly integrated into the central system and lose their discretion.

Institutional Reconfiguration and Governance Realignment in the Era of AI-Enabled Public Services

While the previous section mapped the actual conditions of AI implementation in various cities, this section goes further by examining how AI technology drives changes in institutional structures and governance realignment. The focus is no longer on what is being implemented, but on how AI changes working relationships, authority flows, and policy control between central and local governments. This transformation is not linear, but rather produces new patterns that reflect a combination of decision automation, algorithmic standardization, and cross-level data dependency (Madan & Ashok, 2023; Nascimento et al., 2025; Wadipalapa et al., 2024). Thus, this subchapter reveals the institutional dynamics that shape the new configuration of authority in AI-based public service governance (see figure 4).

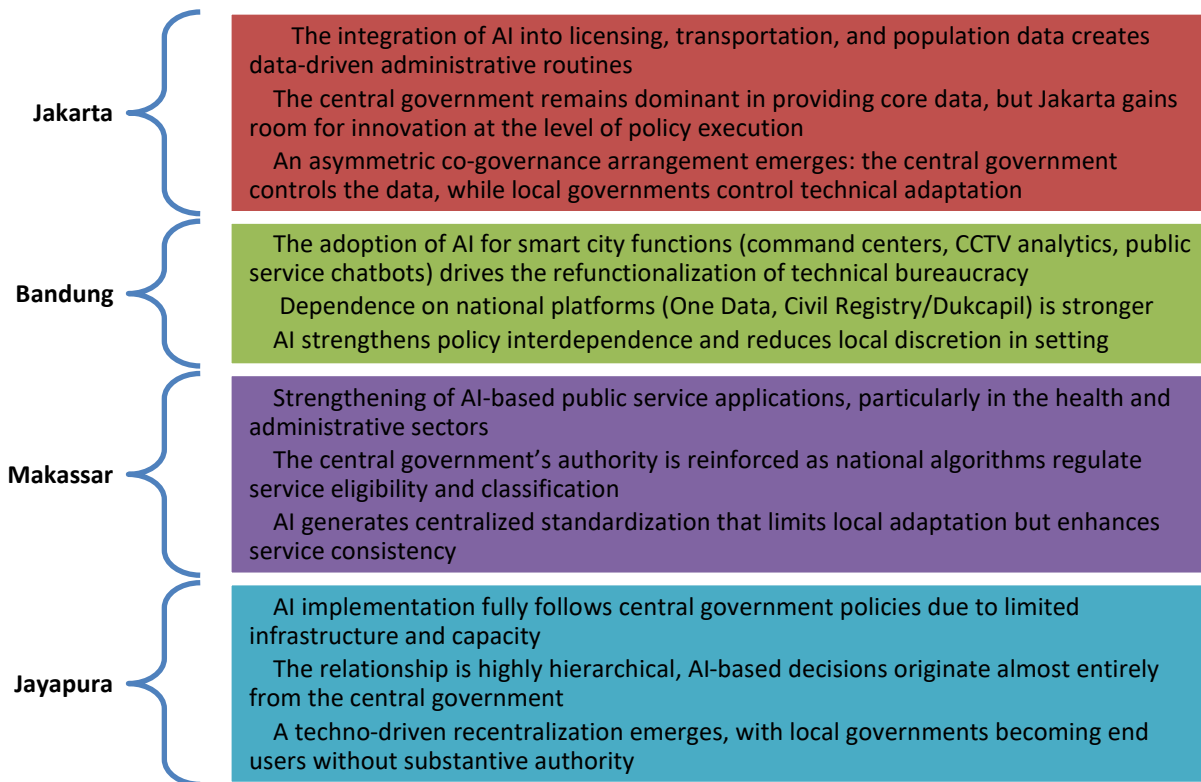


Figure 4. Institutional Reconfiguration and Governance Realignment in the Era of AI-Enabled Public Services. **Sources:** (Judijanto et al., 2023; Madan & Ashok, 2023; Wadipalapa et al., 2024; Wicaksono et al., 2025; Yusriadi et al., 2023).

Based on the Figure 4, it shows that institutional changes resulting from the implementation of AI are not uniform, but create different patterns of stratified governance realignment between cities. In Jakarta, the adoption of AI has enabled the formation of a new, more collaborative configuration of authority, in which the center retains control over core data and standardization, but the regions gain room for innovation in service design and technical implementation. This indicates that high-capacity cities can use AI to build countervailing capabilities against central dominance, while remaining integrated into the national data architecture (Wadipalapa et al., 2024). Conversely, in Bandung and Makassar, AI serves as a mechanism that reinforces institutional dependence. The use of centralized algorithms and national platforms creates a new, more standardized bureaucratic work structure, in which local decisions are increasingly dependent on classification logic regulated by the center, for example in determining social assistance eligibility or managing population data (Hardi et al., 2025; Yusriadi et al., 2023).

Jayapura presents the most extreme form of this realignment of authority. Limited technological capacity and human resources mean that AI implementation is entirely top-down, giving rise to a form of recentralization by design. When national algorithms take over functions previously performed by regional officials, such as data verification, risk assessment, or document validation, regions lose their deliberative and discretionary capacities (Karepouwan, 2025; Wadipalapa et al., 2024). This analysis confirms that AI is not merely a technical tool but an institutional mechanism that can reshape central-regional relations. Variations between cities reflect not only technological readiness but also how power is restructured through digital infrastructure, algorithmic logic, and national data architecture. Thus, the realignment of authority in the AI era is a political process embedded in technological design, not merely the result of administrative innovation.

Discussion

Empirical findings from four cities, including Jakarta, Bandung, Makassar, and Jayapura, show that the application of AI in public services reflects not only technological readiness, but also the shifting dynamics of authority between the central and regional governments. Jakarta, with its most mature digital ecosystem, shows how high local capacity enables the city government to develop technical innovations and utilize AI for data-driven administrative decision-making, as exemplified by the initiative (Judijanto et al., 2023; Wadipalapa et al., 2024). However, this innovation space remains within the orbit of central control due to dependence on national datasets such as Population and Civil Registration Office (Dukcapil) and Indonesia One Data. In contrast, Bandung and Makassar, although quite progressive in utilizing command centers, CCTV analytics, and service automation, are still highly dependent on central interoperability protocols (Hardi et al., 2025; Wulandari & Munawaroh, 2020). Jayapura presents the most extreme situation, where infrastructure and human resource limitations make AI adoption entirely dependent on systems and algorithms designed by the central government, reflecting a pattern of recentralization occurring through technological design (Chairuddin et al., 2024).

These variations reveal important mechanisms of how AI can function as an institutional instrument that reorganizes central-regional relations. The integration of algorithms and data standardization creates a new bureaucratic working structure that shifts the locus of authority from local officials to technical designs established by the central government or national vendors (Gritsenko & Wood, 2022). Decision automation, for example in document verification, beneficiary classification, or service prioritization, reduces the discretion of local officials and centralizes control within a nationally uniform algorithmic logic (Vogl et al., 2020). In high-capacity cities such as Jakarta, this situation results in a form of asymmetric co-governance, the center controls core data while the regions manage technical implementation. However, in medium- and low-capacity cities, this mechanism further reinforces vertical dependency, as the standards and operating rules embedded in the algorithms bind local decisions without contextual flexibility (Goldsmith, 2025).

This configuration has significant implications for public governance and regional autonomy (Nizov, 2025). The implementation of standardized AI can indeed improve administrative efficiency and service consistency, but at the same time it obscures accountability because decisions that could previously be rationalized by local officials are now generated by a centrally controlled system. In some cities, particularly Bandung and Makassar, increased technological capacity has actually reduced the space for local deliberation in setting policy priorities, as AI models rely on national categories that do not always match local needs. Meanwhile, the context in Jayapura shows how technology can reinforce administrative hierarchies, the national AI system takes over the substantive functions of local officials, reducing them to mere operators rather than decision-makers. This shows that rather than being a neutral instrument, AI has the potential to deepen regional disparities through the reproduction of central authority in technical structures.

These variations show how AI is reshaping central-regional relations, a finding supported by (Kuziemski & Misuraca, 2020; Vogl et al., 2020) which shows that algorithmic standardization shifts authority from local officials to national technical design. (Goldsmith, 2025) also asserts that data-driven automation creates asymmetric co-governance, especially in high-capacity cities. However, some studies provide a different picture Li et al., (2025) and Madan & Ashok, (2023) found that AI can actually expand regional discretion when digital capacity is adequate, whereas (Kuziemski & Misuraca, 2020) warns that algorithms can reproduce inequalities and reinforce administrative hierarchies, especially in disadvantaged areas. Meanwhile, (Zuiderwijk et al., 2021) shows that adaptive AI designs can reduce vertical dependency. Overall, these five studies show that AI is not

entirely neutral, it can reinforce centralization or open up opportunities for the relocation of authority, depending on regional capacity and institutional configuration. The shift in local-central authority resulting from AI adoption becomes clearer when examined through various research findings that reinforce or contradict these dynamics (see Figure 5).

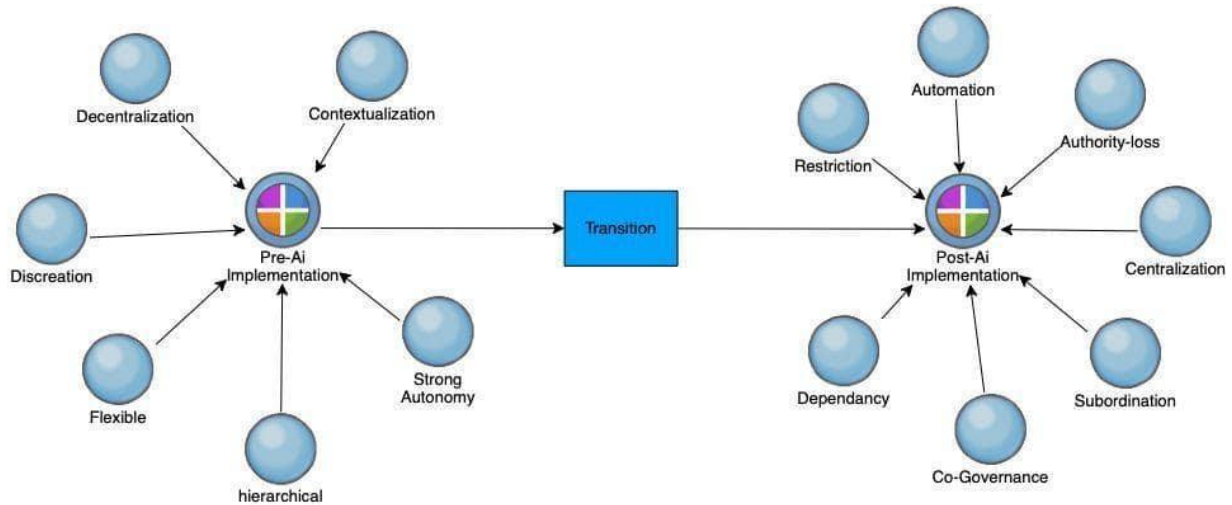


Figure 5. Nvivo Analysis of Reconfiguration of Central-Local Authority in Indonesia's Public Services: Pre- and Post-AI Implementation Dynamics. **Source:** Nvivo 12, 2025.

Based on figure 5, the transformation of central-local authority in Indonesian public services before and after AI implementation. Prior to AI adoption, local governments exhibited autonomy, flexibility, contextualization, and adaptability, enabling officials to tailor policies and administrative decisions to local needs within a decentralized governance framework. With AI integration, however, authority increasingly shifts toward the center through mechanisms such as reorganization, centralization, automation, and restriction. High-capacity cities like Jakarta experience co-governance, where the center controls core datasets while regions manage technical implementation, preserving some limited-innovation space. Medium-capacity cities such as Bandung and Makassar face dependency on central interoperability protocols and constraint in local decision-making. In low-capacity cities like Jayapura, the shift is most pronounced, local officials experience subordination, authority-loss, and operatorization, reflecting a scenario where AI automates substantive functions, leaving local actors as executors of centrally defined processes. Overall, the visualization captures the asymmetric redistribution of decision-making power, highlighting how AI functions as both a tool of efficiency and an instrument of recentralization in public governance.

Implications

This study expands the academic framework on the transformation of central-regional power relations in the digital and AI era by highlighting the dynamics of algorithmic governance and the shift in authority resulting from the application of AI in Indonesian government governance. The findings show that AI is not only a technical tool but also an agent of change that reinforces existing digital inequalities, giving rise to asymmetrical relationships based on data control and algorithmic standardization that strengthen central power while providing opportunities for reformative autonomy for regions with high digital capacity. Thus, the traditional hierarchical model is replaced by a new, more complex pattern characterized by hybrid governance and relationships dominated by data sovereignty and data-driven decision making, which has important implications for the

theory of central-regional relations and the concept of decentralization in the context of government digitalization.

In practical terms, the results of this study identify that the successful implementation of AI in public services is highly dependent on infrastructure readiness, institutional capacity, and data management at the regional level. The central government needs to formulate policies that not only encourage uniform technology adoption but also strengthen regional institutional capacity through training, infrastructure development, and regulations that mitigate the risks of algorithmic bias and digital inequality. In addition, cross-level collaboration must be directed towards creating an open and secure data ecosystem, thereby enabling inclusive and sustainable innovation, and reducing the potential for centralization that could limit regional autonomy and diversity of regional innovation.

From an institutional perspective, this study emphasizes the need to adjust organizational structures and institutional decision-making mechanisms to be more adaptive to digital transformation and AI. The establishment of an independent and autonomous national data management agency is crucial to ensure transparent and accountable data management, as well as to support a more balanced relationship between the central and regional governments. Furthermore, it is necessary to develop a regulatory framework that is capable of consistently regulating algorithmic and ethical standards for AI at the national and regional levels, as well as strengthening the institutional capacity of local governments to manage and integrate AI systems that are appropriate to the local context, thereby encouraging the decentralization of data management and strengthening regional autonomy in this digital era.

Conclusion and Limitations

This study highlights how the application of Artificial Intelligence (AI) in public services in Indonesia has triggered significant changes in the dynamics of central-regional power relations, with the main finding that AI reinforces digital inequality and creates new relationships based on algorithmic governance, data sovereignty, and data control. Its contribution to the field of study includes the development of a theoretical framework on the transformation of authority and institutions in the context of government digitalization in developing countries, as well as offering empirical insights into the variations in AI implementation in various local contexts in Indonesia. This study recommends that central and regional governments enhance strategic collaboration through institutional capacity building, inclusive regulation, and transparent data management to ensure sustainable and inclusive AI innovation, and suggests that policies align technology adoption with the principles of regional autonomy and socio-economic diversity. For further development, future studies are expected to explore the ethical aspects of AI use, its impact on human rights, and the dynamics of community participation in AI-based decision-making processes.

The main limitation of this study lies in the use of cross-sectional secondary data limited to four cities in Indonesia, which may not fully reflect the complexity and contextual diversity at the national level. In addition, the focus of the analysis on institutional aspects and power relations ignores socio-cultural factors, public perceptions, and ethical aspects that also influence the overall success of AI implementation. It should also be noted that the rapid development of AI technology requires further research to understand its long-term impact and the evolution of accompanying regulations and policies.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. All authors contributed equally in conceptualization, study design, data collection, data analysis plan, data interpretation, manuscript writing.

Use of Artificial Intelligence (AI)-Assisted Technology

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

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