

Anticipatory Smart Governance: Public Policy Strategy for Urbanization Mitigation and Public Services in the IKN Buffer Zone

Aldi Saputra^{1*}, Eddy Iskandar¹

¹ Department of Government Science, Faculty of Social and Political Sciences,
Mulawarman University, Samarinda, Indonesia.

Article History

Received:
22.07.2026

Revised:
02.09.2026

Accepted:
12.09.2026

***Corresponding Author:**
Aldi Saputra
Email:
aldisaputrasaf@gmail.com

This is an open access article,
licensed under: [CC-BY-SA](#)



Abstract: The relocation of Indonesia's capital to the Nusantara Capital City (IKN) has fundamentally transformed the administrative and socio-economic landscape of Balikpapan City as its primary buffer zone and gateway. This study addresses the core research problem of how local government institutional capacity and public service frameworks adapt to rapid urbanization pressures driven by national-scale capital relocation. While existing literature predominantly frames smart governance through technological adoption, this study argues for a deeper structural alignment between data integration, inter-agency collaboration, and predictive policy capacity. Utilizing a qualitative case study design, empirical data were gathered through in-depth interviews with 18 key informants comprising municipal officials from key regional apparatus organizations (OPD) of Balikpapan, representatives from the IKN Authority (OIKN), and urban planning experts alongside rigorous document analysis and focus group discussions. Data were systematically processed and coded using NVivo 14 software to identify thematic nodes, with data validity established via source and methodological triangulation. The findings reveal that conventional digital applications are severely hindered by institutional fragmentation, entrenched "sectoral ego," limited human resource capabilities, and bureaucratic silos. To overcome these barriers, the study introduces and advances the theoretical novelty of Anticipatory Smart Governance an integrated framework that synergizes cross-sector data integration, predictive demand forecasting, early warning mechanisms, and multi-level governance. Practically, this framework equips local governments to transition from reactive administrative firefighting to proactive, preventive policymaking. Theoretically, the study bridges the gap between urban mitigation studies and anticipatory public administration, offering a robust paradigm for secondary cities navigating metropolitan integration.

Keywords: Anticipatory Smart Governance, Balikpapan, IKN Buffer Zone, Public Services, Urbanization Mitigation.



1. Introduction

The relocation of Indonesia's capital city to East Kalimantan has created a major change in the development pattern of the region. The impact of the policy is not limited to the area designated as the Nusantara Capital City (IKN), but also extends to cities and regions that support its development. Law Number 3 of 2022 establishes IKN as a new center of economic growth and places its development within a wider regional context [1]. Among the surrounding areas, Balikpapan has an important position because of its transportation infrastructure, economic activities, trade networks, and the availability of education and health services. These conditions make Balikpapan one of the cities that is likely to receive increasing population movement and economic activity as IKN develops. The growing interaction between Balikpapan and IKN, however, also creates additional demands for the city.

Population mobility can increase the need for housing, transportation, clean water, health services, education, administrative services, and other basic urban services. Lidyana and Dewanti [2], for example, found that the development of IKN has the potential to encourage migration not only toward the new capital area but also toward supporting cities such as Balikpapan. At the same time, Balikpapan still faces limitations in several aspects of urban infrastructure and public services, including clean water, the availability of medical personnel, public facilities, and urban mobility [2].

Similar concerns can be understood from the experience of buffer cities, where rapid changes in population and economic activity may be followed by urban expansion and increasing infrastructure pressure. Balikpapan's role as an important gateway and logistics center for IKN further increases the city's exposure to these changes. Therefore, the issue is not simply whether Balikpapan can accommodate population growth, but whether its government has sufficient capacity to identify and respond to changes in public service needs before they become more difficult to manage.

This situation places local government in a position where conventional responses to public service problems may no longer be sufficient. Government needs information that can explain not only current service conditions but also possible changes in demand. In this regard, the use of digital technology becomes increasingly relevant. However, smart governance should not be understood simply as the development of digital applications or the conversion of conventional services into online services. Meijer and Bolívar [3] describe smart urban governance as a broader governance process involving technology, institutions, actors, and new forms of interaction in the management of urban affairs.

Bolívar and Meijer [4] similarly emphasize that information and communication technologies can strengthen the capacity of public administration when they are connected to institutional and organizational processes. Ruhlandt [5] also shows that the implementation of smart city governance is strongly influenced by institutional arrangements, government capacity, actors, and policy objectives. This perspective is particularly relevant to Balikpapan. The city has developed a number of digital initiatives, but digitalization alone does not necessarily resolve the institutional problems underlying public service delivery. Previous studies have identified several constraints in the implementation of smart governance in Balikpapan, including institutional capacity, human resources, financial resources, technological infrastructure, and public participation [6] [7]. These limitations indicate that the challenge of smart governance is partly an organizational issue. The effectiveness of digital transformation depends on whether government institutions are able to coordinate, share information, and use available data in the policy process.

Another issue concerns the fragmentation of government organizations. Different agencies often manage data and public services according to their respective mandates. When these systems are not connected, information that could be useful for identifying emerging urban problems remains separated across sectors. The problem becomes more significant when population growth and mobility affect several public services at the same time.

Research on digital transformation in Balikpapan has identified the persistence of sectoral ego as one of the factors that complicates coordination and integration among regional government organizations [8]. This finding is consistent with broader research on Indonesian local government, which identifies institutional fragmentation and sectoral interests as important barriers to digital integration. Thus, improving smart governance requires more than adding new technologies; it requires changes in the way government organizations exchange information and work together.

The importance of data becomes even greater when public service demand is changing rapidly. Digitalization can produce large amounts of information concerning population movement, public complaints, health services, transportation, infrastructure, and other aspects of urban life.

Nevertheless, the existence of data does not automatically mean that government is able to use it strategically. Recent research on urban public service digitalization in Indonesia suggests that the next challenge is moving from the provision of digital services toward the effective use of technology and data in policy formulation [9] [10].

Data-driven urban governance can provide governments with a basis for identifying patterns and changes in service demand, but this requires institutional capacity and coordination across sectors [11]. In other words, the central question is no longer simply whether the government has digital systems, but whether those systems can support better decisions. The need for such capacity becomes particularly important in the context of IKN because the consequences of urban change may develop faster than the government's conventional planning cycles. A sudden increase in population mobility, for instance, may affect transportation, housing, health facilities, clean water, and administrative services simultaneously. If government action only begins after service problems have become visible, policy responses may be delayed and more costly.

This creates a need for a governance approach that places greater emphasis on anticipating potential changes. The idea is closely related to anticipatory governance, which emphasizes the capacity of institutions to recognize possible future developments and incorporate them into present decision-making [11]. Fuerth [12] further explains that anticipatory governance requires future-oriented analysis and foresight to be connected to actual policy and decision-making processes.

The combination of smart governance and anticipatory governance provides an alternative way of understanding Balikpapan's position as an IKN supporting city. Smart governance provides the technological, institutional, and collaborative foundation, while anticipatory governance adds the capacity to look beyond existing conditions and prepare for potential future pressures. In this approach, information generated through digital systems is not treated merely as administrative data. It can become an input for identifying trends, assessing risks, developing early warnings, and determining preventive policy measures. Data-driven smart city research has similarly demonstrated the potential to move local government from managing existing infrastructure toward developing more anticipatory public policies [13].

Such an approach also requires collaboration that extends beyond individual government agencies. The impacts of IKN development cross administrative and institutional boundaries, making coordination among local, provincial, central, and IKN authorities increasingly important. Public service provision in a region that is becoming more interconnected cannot rely entirely on the autonomy of a single local government. It requires a clear distribution of responsibilities and coordination among different levels of government [14] [15]. At the operational level, the integration of public service information with urban infrastructure and logistics data can also support more responsive urban management. Collaborative governance is therefore an important component because data and policy resources are distributed across different institutions.

Despite these developments in the literature, existing studies leave an important gap. Research concerning Balikpapan's position in relation to IKN has generally examined infrastructure readiness, spatial development, and community adaptation to the capital relocation. Meanwhile, studies of smart governance in Balikpapan have mainly focused on institutional capacity, resources, digitalization, and implementation challenges.

These two strands of research have not yet sufficiently explained how urbanization generated by IKN development can be connected with smart governance as a capacity for anticipating changes in public service demand. This gap is important because urbanization should not only be understood as a pressure that government must manage. Changes in population movement, service demand, public complaints, infrastructure use, and other urban activities can also provide information about what may happen in the near future. When such information is integrated across sectors and analyzed appropriately, it can support earlier government intervention. Smart governance, therefore, can be developed beyond its conventional function as a mechanism for improving service efficiency and toward a broader policy capacity for anticipating urban change. Based on this perspective, this study proposes the concept of Anticipatory Smart Governance.

The concept refers to a governance approach that connects digital technology and integrated data with institutional capacity, cross-sector collaboration, public participation, predictive analysis, and preventive policy action. Its purpose is not simply to improve the availability of digital public services, but to strengthen the ability of government to identify potential changes in urban conditions and respond before those changes create serious pressure on public services. In the case of

Balikpapan, this approach is particularly relevant because the city is simultaneously experiencing the opportunities and pressures generated by its strategic relationship with IKN.

The novelty of this study lies in connecting three dimensions that have largely been discussed separately: urbanization pressure, smart governance, and public service capacity. Rather than treating digitalization as the final objective, this research positions digital governance as a means of developing anticipatory policy capacity. The study also places this framework within the specific context of Balikpapan as an IKN supporting city, where urban changes are closely connected to a national-scale development project. Through this perspective, the research seeks to explain how integrated data, institutional coordination, and collaborative governance can be used to anticipate changes in public service demand.

The study aims to formulate a governance strategy that can strengthen the capacity of Balikpapan City Government to anticipate and manage the impacts of urbanization associated with IKN development. In particular, it focuses on the role of data integration, inter-agency coordination, public participation, and institutional capacity in supporting more adaptive and preventive public service policies. The study is expected to contribute to the development of smart governance research while providing a practical framework for local government in managing the continuing urban transformation surrounding IKN.

2. Literature Review

2.1. Smart Urban Governance and Institutional Realities

Contemporary scholarship establishes that smart governance extends far beyond the mere computerization of administrative tasks or the creation of public service mobile applications [16] [17] [18]. Meijer and Bolívar conceptualize smart urban governance as a complex socio-technical process that relies on intensive institutional collaboration, stakeholder engagement, and the transformation of administrative culture [3]. Reinforcing this view, Bolívar and Meijer emphasize that information and communication technologies (ICT) only augment public administration capacity when tightly coupled with robust organizational structures and transparent institutional frameworks [4]. Furthermore, Ruhlandt demonstrates through systematic evaluation that successful smart city implementation is inextricably contingent upon political will, bureaucratic readiness, and inter-organizational alignment [5].

Within the context of Indonesian local governments, these theoretical propositions encounter severe operational hurdles [19] [20]. Research by Nawawi et al. underscores that regional apparatus readiness in secondary cities often suffers from deficiencies in digital literacy, budgetary constraints, and rigid hierarchical traditions [6]. Setiawan et al. corroborate that technological adoption frequently outpaces institutional capacity, leading to disconnected digital islands [7]. Compounding this, recent inquiries by Akbar et al. highlight that "sectoral ego" remains a pervasive pathology within regional governance, obstructing seamless interoperability and data sharing among municipal departments [8]. Thus, overcoming these structural bottlenecks requires an analytical framework that prioritizes institutional integration over superficial software procurement [21] [22] [23].

2.2. Urbanization Pressure in IKN Buffer Zones

The geopolitical shift entailed by capital city relocation generates profound spatial and demographic repercussions for surrounding territories [24] [25]. Pratama et al. note that buffer cities adjacent to newly constructed national capitals routinely suffer from aggressive urban sprawl, skyrocketing land speculation, and acute infrastructure deficits [15]. In the specific case of Balikpapan, its dual status as the principal maritime and aviation gateway and the primary logistics depot for IKN construction magnifies its exposure to sudden population influxes. Lidyana and Dewanti observe that migration flows toward Balikpapan outpace the municipal government's capacity to expand basic urban amenities, resulting in severe bottlenecks in clean water provision, traffic management, and healthcare infrastructure [2]. These empirical realities demonstrate that buffer zone governance cannot be managed through insular municipal planning; it requires a multi-level governance perspective that coordinates local, provincial, and national authorities alongside the IKN Authority (OIKN) [14].

2.3. Anticipatory Governance and Data-Driven Policymaking

To reconcile the mismatch between rapid urban transformation and sluggish bureaucratic responsiveness, administrative science looks toward the paradigm of anticipatory governance [26] [27]. Guston defines anticipatory governance as a broad-based capacity that enables institutions to

systematically peer into the future, identify emerging systemic risks, and embed foresight into current policy design [11]. Fuerth operationalizes this concept by arguing that traditional reactive governance must be replaced by structured future-oriented analysis (*foresight*) that directly informs executive decision-making [12].

In the realm of modern urban management, Silva et al. demonstrate that the proliferation of big data and integrated digital dashboards provides the empirical bedrock necessary to transition local authorities from passive infrastructure operators to proactive formulators of preventive policy [13]. Similarly, Santoso and Yudianto emphasize that data-driven policy formulation minimizes administrative lag, allowing governments to intervene before localized service failures cascade into systemic crises [20]. By synthesizing these theoretical streams, this study positions Anticipatory Smart Governance as an essential conceptual bridge: uniting digital infrastructure [28], cross-sectoral data integration [29], and collaborative frameworks to empower municipal authorities in mitigating urbanization pressures proactively [30].

3. Methodology

This study adopts a qualitative approach utilizing an instrumental case study design to examine public policy strategies for urbanization mitigation and smart governance in Balikpapan City. A qualitative case study methodology is optimal as it enables an in-depth, context-rich exploration of complex socio-bureaucratic phenomena, institutional arrangements, inter-agency coordination failures, and policy innovation mechanisms within their real-world administrative setting.

3.1. Informant Selection and Empirical Data Sources

Primary empirical data were gathered through semi-structured, in-depth interviews conducted between January and May 2026. To ensure high credibility and comprehensive representation, informants were selected using purposive and snowball sampling techniques based on their direct operational and strategic involvement in urban planning, public service delivery, digital transformation, and IKN buffer management. A total of 18 key informants participated in this study, comprising:

- 1) Municipal Government Officials (Balikpapan City): Heads and senior analysts from the Department of Communication and Informatics (Diskominfo), the Regional Development Planning Agency (Bappeda), the Department of Population and Civil Registration (Disdukcapil), and the Public Works Agency (3 informants each; total 12).
- 2) National and Regional Stakeholders: Officials from the Nusantara Capital City Authority (OIKN) Regional Integration Directorate (3 informants).
- 3) Academic and Civil Society Experts: Urban governance scholars from Mulawarman University and representatives of local civic watchdog organizations focusing on public service accountability (3 informants).

Secondary data sources encompassed official municipal regulations, regional development master plans (RTRW/RPJMD), strategic evaluation reports on digital transformation, official statistical compendiums from BPS-Statistics Balikpapan, and internal governmental documentation regarding IKN buffer mitigation.

3.2. Data Analysis and Triangulation via NVivo 14

All interview transcripts, focus group transcripts, and documentary texts were transcribed verbatim, anonymized, and imported into NVivo 14 qualitative data analysis software to ensure systematic data management and transparent coding trails. In accordance with rigorous qualitative protocols, data analysis progressed through three iterative stages:

- 1) Open Coding: Dissecting raw texts to isolate foundational concepts regarding population mobility, digital infrastructure limitations, and bureaucratic friction.
- 2) Axial Coding: Grouping open codes into cohesive sub-nodes and parent categories, mapping thematic relationships between urbanization pressures and smart governance bottlenecks.
- 3) Selective Coding: Synthesizing core theoretical dimensions around predictive demand modeling, early warning mechanisms, and anticipatory policy formulation.

To guarantee empirical validity and research reliability, the study implemented rigorous triangulation techniques:

- 1) Source Triangulation: Cross-verifying claims made by municipal agency bureaucrats against documentation records, academic assessments, and civil society observations.
- 2) Methodological Triangulation: Comparing qualitative interview assertions against quantitative administrative data trends extracted from municipal digital dashboards.

Data analysis is carried out systematically through the stages of data condensation, data presentation, and conclusion withdrawal and verification. In the analysis process, the study used NVivo as a qualitative data processing software. NVivo is not used as a research method, but as a tool to organize and analyze interview data, documents, and field notes in a more systematic manner. The data that has been obtained is transcribed, imported into NVivo, then a *coding process* is carried out based on themes relevant to the focus of the research. So that the *coding process* is carried out in stages, starting with open coding to identify important concepts and information from the data, followed by grouping the code into broader categories through axial coding, as well as the development of the main theme through selective coding. The code and categories are directed at several key aspects of the research shows in Table 1.

Table 1. Coding Framework Used for Qualitative Data Analysis

N/A	Parent Node	Sub-Node	Fokus Coding
1	Urbanization Pressure	Population mobility Growth in economic activity Infrastructure pressure Service needs Spatial changes	Movement/mobility due to IKN Economic activity and investment Roads, transportation, clean water, sanitation Education, health, administration Housing, land, land value
2	Smart Governance	Digitization of services Infrastructure digital HR Capacity Institutional Community participation	Service application/platform Technology and information systems Apparatus capabilities Regulation and organizational structure Complaints, consultation, co-production
3	Integration and Collaboration	Data integration OPD coordination Fragmentation/sectoral ego Multi-level governance Public/private collaboration	Data between OPDs Inter-organizational relationships Coordination barriers City Government Provincial Government OIKN Central Non-governmental actors
4	Anticipatory Smart Governance	Demand prediction Early warning Data-driven policy Preventive policy Adaptive governance	Forecasting service needs Early detection of service pressure Data-driven policies Intervention before problems occur Adaptability

The results of NVivo analysis are then not treated as the results of the research automatically, but are interpreted by the researcher based on the empirical context and theoretical framework used. This process allows researchers to identify patterns, similarities, differences, and relationships between categories that emerge from the data. The findings are then compared with the results of observations and documents to triangulate sources and techniques, thereby increasing the credibility of the research findings. The final stage of analysis is directed to discover how *smart governance* can function as an *anticipatory policy capacity* in facing urbanization pressures and maintaining the quality of public services.

4. Finding and Discussion

4.1. Finding

(1) Urbanization Pressures and Multidimensional Strains on Balikpapan

Data analysis using NVivo indicates that the issue of urbanization within the context of Balikpapan serving as a supporting region for the IKN (New Capital City) can be grouped into several key

categories: population mobility, infrastructure strain, rising demand for public services, economic activity, and spatial changes. This categorization demonstrates that urbanization is not understood merely as population growth, but rather as a multidimensional transformation that impacts local government capacity.

Figure 1 illustrates the NVivo coding analysis of urbanization pressure in the Balikpapan case study.

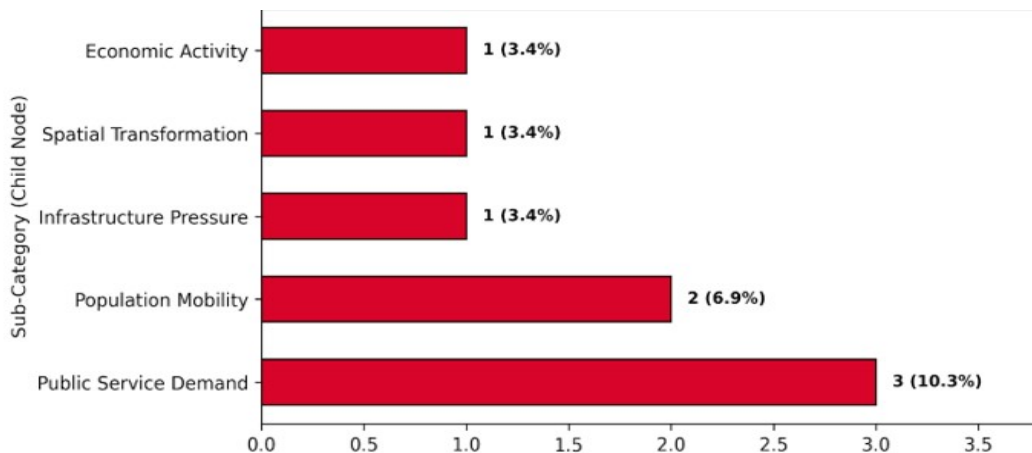


Figure 1. NVivo Coding Analysis of Urbanization Pressure in Balikpapan

During the coding process, statements from informants regarding population growth and mobility resulting from the development of the IKN (New Capital City) were categorized under the “population mobility” node. Meanwhile, statements concerning the increased demand for roads, transportation, clean water, sanitation, and public facilities were classified as “infrastructure pressure.” Statements regarding rising public needs for healthcare, education, population administration, and social services were categorized as “public service needs.” These coding results reveal a link between urbanization and the increased burden on local government services. This finding aligns with previous research indicating that IKN development has the potential to drive population migration to Balikpapan while simultaneously straining various service and infrastructure sectors. Consequently, urbanization can be viewed as a “policy pressure” requiring a cross-sectoral policy response. The government is required not only to enhance existing service capacities but also to possess the ability to anticipate changes in service demands resulting from IKN development.

Empirical analysis of interview transcripts and regional documents through NVivo 14 reveals that urbanization in Balikpapan propelled by the magnet effect of IKN development manifests across five primary sub-categories: population mobility, economic activity acceleration, infrastructure strain, surging public service demands, and spatial transformation.

Informants from Bappeda explicitly highlighted the demographic shock:

“Since the master construction of IKN commenced in Sepaku, our daily population influx has surged exponentially. We are not just seeing permanent settlers, but tens of thousands of construction workers, consultants, and transient business migrants renting properties in North and South Balikpapan, placing immediate pressure on our clean water distribution and traffic corridors.”

(Senior Planner, Bappeda Balikpapan, Interview March 2026)

This empirical reality confirms that urbanization operates as an external shock demanding systemic administrative adaptation rather than business-as-usual management.

(2) Implementation of Smart Governance in Supporting Public Services

Subsequent NVivo coding results indicate that the implementation of smart governance can be

categorized into the following nodes: service digitalization, digital infrastructure, human resource capacity, institutional aspects, and public participation.

Figure 2 presents the NVivo coding analysis for the Smart Governance dimension in the Balikpapan case study.

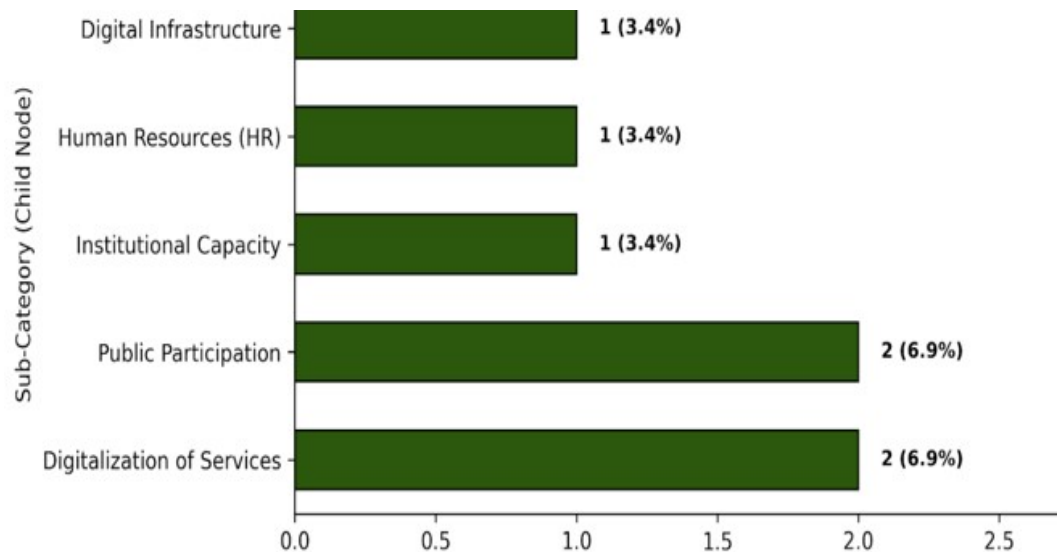


Figure 2. NVivo Coding Analysis of Smart Governance in Balikpapan

NVivo thematic coding regarding smart governance implementation highlights persistent structural disparities across service digitalization, digital infrastructure, human resource capacity, institutional readiness, and public participation. While the municipal government has launched multiple electronic portals for licensing and civil registration, bureaucratic readiness remains uneven.

An informant from Diskominfo acknowledged structural constraints:

“We have the applications and the basic cloud servers, but our operational challenge lies in the uneven digital competence across different sub-departments. Furthermore, older bureaucratic workflows often dictate that online systems are treated merely as digital filing cabinets rather than active tools for service delivery integration.”

(Digital Infrastructure Division Head, Diskominfo Balikpapan, Interview April 2026).

The analysis indicates that technology serves as a crucial foundation for the development of smart governance, yet it does not operate in isolation. The implementation of smart governance is also influenced by institutional capacity and human resources. These findings reinforce the research by Setiawan, Ilham, and Nawawi [7], which demonstrated that smart governance implementation in Balikpapan still requires strengthening in terms of institutional aspects, budgeting, information technology infrastructure, and public participation. The results also align with the perspective of Meijer and Bolívar [3], who view smart governance not merely as the application of information technology, but as a process of establishing new forms of technology-facilitated collaboration to achieve better governance. Consequently, the NVivo results indicate that the mere presence of technology is insufficient to bring about smart governance; technology must be effectively utilized to enhance the government's capacity to understand issues, coordinate, make decisions, and create public value.

(3) Data Integration and Inter-Agency Collaboration in Urbanization Mitigation

NVivo analysis indicates that the theme of integration and collaboration comprises several key nodes: data integration, inter-agency coordination, institutional fragmentation, multi-level governance, and collaboration with the community and the private sector.

Figure 3 presents the NVivo coding analysis for the Data Integration and Collaboration dimension in the Balikpapan case study.

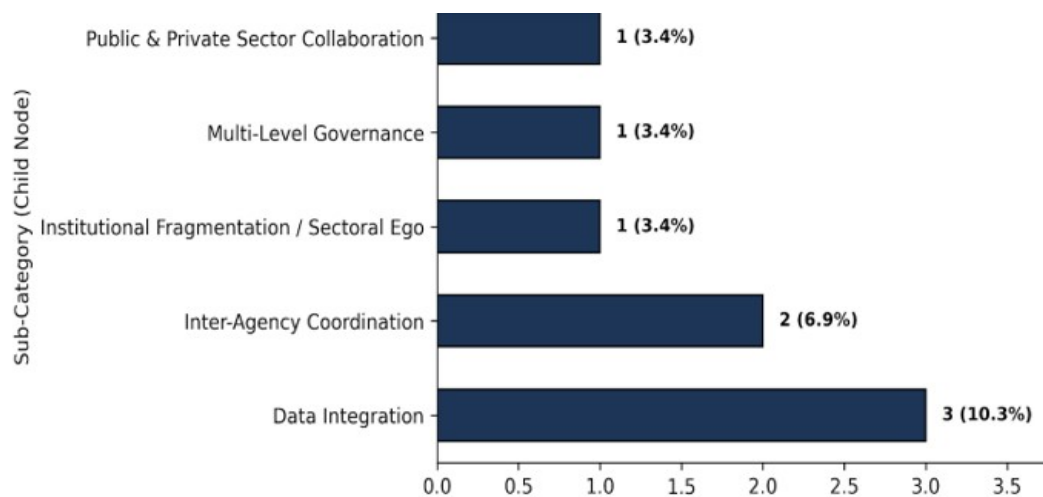


Figure 3. NVivo Coding Analysis of Data Integration and Collaboration in Balikpapan

The data integration node highlights the need to interconnect the various sectoral datasets held by the government. Data regarding population, health, education, transportation, spatial planning, housing, and public complaints must be viewed as a unified body of information to assess urban development. Meanwhile, the inter-agency coordination node underscores the importance of horizontal linkages among local government bodies. Urbanization cannot be managed by a single agency alone, as its impacts span multiple public service sectors. Analysis also focuses on the node of institutional fragmentation or “sectoral ego.” Previous research by Akbar et al. [8] identified issues regarding sectoral ego within Balikpapan’s government digital transformation. These findings are significant because technology integration without institutional integration risks producing digital systems that continue to operate in silos. Consequently, smart governance requires a shift from fragmented working patterns toward integrated governance. In the context of Balikpapan serving as a support area for the New Capital City (IKN), integration must also extend to relationships involving the provincial and central governments, the IKN Authority, the private sector, and the community. Thus, addressing urbanization requires a multi-level approach and collaborative governance. The coding matrix concerning integration and collaboration identifies data silos, inter-agency coordination barriers, institutional fragmentation (*sectoral ego*), multi-level governance friction, and public-private collaboration dynamics as critical vulnerabilities.

An OIKN integration liaison emphasized the institutional disconnect:

“The biggest hurdle is not technology; it is the institutional ego. The regional apparatus organizations (OPD) are accustomed to guarding their own departmental data strictly. When population mobility spikes, Disdukcapil has demographic data, the Health Office has hospital capacity data, and Public Works has road congestion data, but they rarely share these datasets in real-time across a unified dashboard.”

(Regional Integration Directorate, OIKN, Interview April 2026).

This confirms that technological adoption without structural administrative reform merely digitizes existing bureaucratic silos.

(4) Anticipatory Smart Governance as a Policy Strategy for Mitigating Urbanization

Based on NVivo coding results, the analysis focuses on nodes related to service demand prediction, early warning systems, data-driven policy, preventive policy, and adaptive governance.

Figure 4 illustrates the NVivo coding analysis of the Anticipatory Smart Governance dimension in the Balikpapan case study.

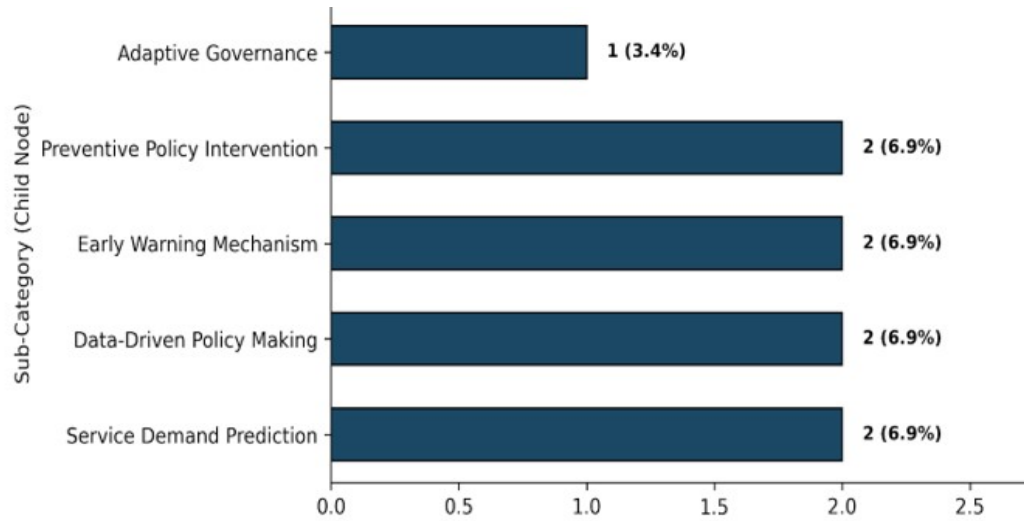


Figure 4. NVivo Coding Analysis of Anticipatory Smart Governance in Balikpapan

The service demand prediction node demonstrates the government's ability to use data to forecast future public needs. The early warning node relates to the capacity to identify early signs of strain on service delivery. Meanwhile, data-driven policy reflects the use of data as a foundation for policy decision-making. Based on this coding, a conceptual link emerges: the better the data integration and inter-agency coordination, the greater the government's capacity to formulate anticipatory policies. These findings build upon previous research, which largely framed “smart governance” in terms of digitalization and implementation capacity. In contrast, this study positions smart governance as a policy capacity for anticipating the impacts of urbanization. This concept aligns with the need to develop “anticipatory urban governance” an approach that leverages technology and data to forecast future conditions and enable early government intervention. Based on this analysis, the study formulates the concept of “Anticipatory Smart Governance”: the government's capacity to utilize data, technology, institutional frameworks, collaboration, and public participation to predict, prevent, and respond to the pressure’s urbanization places on public services. Thus, the relationships between the coded themes can be summarized as shows in Figure 5.

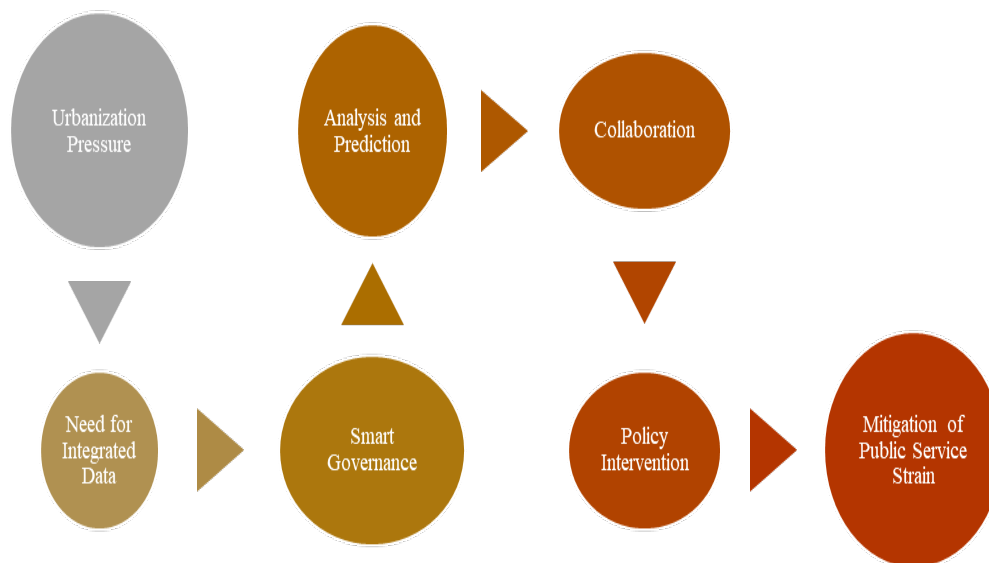


Figure 5. Conceptual Model of Anticipatory Smart Governance

This model demonstrates that technology is not treated as an end in itself. Instead, it serves as an instrument to transform data into information, information into policy-relevant knowledge, and that knowledge into government action. Consequently, the study's novelty lies in evolving the concept of smart governance from a focus on service digitalization toward a model of anticipatory government capacity. This approach enables Balikpapan to move beyond merely reacting to the impacts of urbanization after they occur; instead, it allows the city to identify potential service strains and intervene before they escalate into major issues.

4.2. Discussion

(1) Deconstructing Urbanization Pressures in the IKN Buffer Ecosystem

The empirical findings substantiate the premise that the designation of Nusantara Capital City (IKN) [cite: 1] imposes severe multidimensional stressors on Balikpapan City. As corroborated by spatial planning and urban sprawl literature, secondary cities situated in immediate proximity to newly established national capitals face severe threats of unplanned urban expansion, hyper-inflationary land speculation, and critical infrastructure deficits [15]. Balikpapan's unique dual identity serving simultaneously as the primary maritime entry port, logistical staging ground, and aviation hub for IKN construction magnifies its vulnerability to sudden demographic surges [17]. The qualitative evidence confirms that the velocity of population mobility far outstrips the incremental expansion capacity of municipal services, validating the theoretical necessity for a paradigm shift from passive administration to active urbanization mitigation.

(2) Overcoming Bureaucratic Silos and Sectoral Ego

The empirical findings demonstrate that deploying digital applications does not automatically equate to effective smart governance [3]. As Meijer and Bolívar articulate, smart governance is fundamentally a socio-technical construct requiring deep institutional alignment, collaborative organizational cultures, and clear regulatory frameworks [3] [4]. The persistence of “sectoral ego” and institutional fragmentation identified in Balikpapan mirrors broader structural pathology documented across Indonesian local governments undergoing digital transformation [8] [16]. When regional apparatus organizations (OPD) operate in isolation, vital intelligence concerning water reserves, healthcare utilization, and traffic density remains trapped within departmental silos. Overcoming this barrier requires dismantling administrative boundaries through formal interoperability mandates and collaborative governance frameworks that incentivize cross-sectoral data sharing [19].

(3) Theoretical Contributions of Anticipatory Smart Governance

The conceptual framework developed in this study Anticipatory Smart Governance advances current public policy theory by bridging smart city literature with anticipatory public administration. Traditional smart governance models focus predominantly on operational efficiency and real-time responsiveness to citizen complaints (*reactive e-governance*) [3]. In contrast, Anticipatory Smart Governance integrates future-oriented analysis (*foresight*) with integrated data architectures, transforming municipal governments from passive infrastructure managers into proactive formulators of preventive, data-driven public policies [11] [13]. By establishing multi-level governance mechanisms that link Balikpapan City Government, the East Kalimantan Provincial Government, and the IKN Authority (OIKN) [14], this framework ensures that regional development pressures are addressed holistically, preserving public service quality throughout ongoing metropolitan transformation.

5. Conclusion

The relocation of Indonesia's national capital to the Nusantara Capital City (IKN) has fundamentally redefined Balikpapan City's administrative and developmental trajectory. Operating as the primary buffer zone and logistical gateway, Balikpapan faces unprecedented urbanization pressures that strain municipal infrastructure, public service delivery, and institutional capacity. While digitization initiatives have been introduced, their efficacy remains heavily constrained by bureaucratic fragmentation, institutional silos, and entrenched “sectoral ego” among regional apparatus organizations (OPD).

To resolve these systemic challenges, this study establishes the theoretical and practical framework of Anticipatory Smart Governance. By synthesizing data integration, inter-agency collaboration, predictive demand forecasting, early warning mechanisms, and multi-level governance

involving municipal, provincial, and national authorities (OIKN), the proposed framework enables local governments to transition from reactive administrative firefighting to proactive, preventive policymaking.

Policy Implications Practically, the Balikpapan City Government and the IKN Authority must institutionalize a unified, cross-sectoral data exchange protocol, moving beyond isolated departmental applications toward an integrated urban intelligence dashboard capable of forecasting service strain before crises materialize.

Research Limitations, Methodologically, this study is constrained by its qualitative single-case design focused specifically on Balikpapan City, and relies on a targeted sample of 18 institutional informants. Future Research Directions, Subsequent scholarly inquiries should explore quantitative validation of predictive service demand models across multiple secondary buffer cities surrounding IKN, as well as investigate cross-national comparative frameworks for metropolitan governance in newly established capital regions.

Acknowledgment (Optional)

I would like to express my gratitude to Mulawarman University, specifically the Government Science program and the entire research support team, including my supervisor, Eddy Iskandar, Ph.D.

References

- [1] Indonesia, Law Number 3 of 2022 Concerning the State Capital. Jakarta, Indonesia: State Gazette of the Republic of Indonesia, 2022.
- [2] H. Lidyana and A. N. Dewanti, "Analysis of existing infrastructure conditions in Balikpapan City using the City Prosperity Index," *Jurnal Pembangunan Wilayah dan Kota*, vol. 20, no. 3, pp. 437–451, Sep. 2024, doi: 10.14710/pwk.v20i3.65143.
- [3] A. Meijer and M. P. Rodríguez Bolívar, "Governing the smart city: A review of the literature on smart urban governance," *International Review of Administrative Sciences*, vol. 82, no. 2, pp. 392–408, Apr. 2016, doi: 10.1177/0020852314564308.
- [4] M. P. R. Bolívar and A. J. Meijer, "Smart governance: Using a literature review and empirical analysis to build a research model," *Social Science Computer Review*, vol. 34, no. 6, pp. 673–698, Dec. 2016, doi: 10.1177/0894439315611088.
- [5] R. W. S. Ruhlandt, "The governance of smart cities: A systematic literature review," *Cities*, vol. 81, pp. 1–23, Nov. 2018, doi: 10.1016/j.cities.2018.02.014.
- [6] M. Ilham, I. Setiawan, and M. Nawawi, "Analisis penguatan sumberdaya daerah dalam pelaksanaan smart governance di Kota Balikpapan, Kalimantan Timur," *Jurnal Ilmiah Wahana Bhakti Praja*, vol. 9, no. 1, pp. 63–74, Apr. 2019.
- [7] I. Setiawan, M. Ilham, and M. Nawawi, "Smart governance implementation in Balikpapan City, East Kalimantan," *Jurnal Borneo-Kalimantan*, vol. 6, no. 1, 2020, doi: 10.33736/jbk.2412.2020.
- [8] P. Akbar, A. Nurmandi, D. Mutiarin, H. Jubba, Z. Qodir, P. M. Kutaneegara, and B. Irawan, "Sectoral ego versus collaboration: Comparing the regulatory and institutional foundations of digital transformation in Balikpapan City and Samarinda City," *Kybernology: Journal of Government Studies*, vol. 5, no. 2, 2025, doi: 10.26618/dkjeeg56.
- [9] U. A. Afrilia, A. P. M. H. Asy'Ary, U. Muhiarta, Y. Mayasari, and M. Anangkota, "Transforming public services: The role of digital innovation in Indonesian municipal governance," *Visioner*, vol. 16, no. 1, pp. 60–70, Apr. 2024.
- [10] D. Paramananda and D. Iskandar, "Tingkat kesiapan masyarakat Balikpapan dalam pembangunan IKN Nusantara," *Jurnal Riset Pembangunan*, vol. 7, no. 1, Dec. 2024, doi: 10.36087/jrp.v7i1.182.
- [11] D. H. Guston, "Understanding 'anticipatory governance'," *Social Studies of Science*, vol. 44, no. 2, pp. 218–242, Apr. 2014, doi: 10.1177/0306312713508669.
- [12] K. Muiderman, J. Vervoort, A. Gupta, R. P. Norbert-Munns, M. Veeger, M. Muzammil, and P. Driessen, "Is anticipatory governance opening up or closing down future possibilities? Findings from diverse contexts in the Global South," *Global Environmental Change*, vol. 81, p. 102694, Jul. 2023, doi: 10.1016/j.gloenvcha.2023.102694.
- [13] I. T. Alarsaheb and A. M. Waza, "Smart cities and political accountability: Challenges of data-

- driven governance,” *International Journal of Applied Social Science and Education*, vol. 3, no. 3, doi: 10.59890/ijasse.v3i3.74.
- [14] H. Wollmann, “Public services provision in European countries: From public/municipal to private sector-and back to municipal?,” in *Global Modernization Review*, 2015, pp. 147–156, doi: 10.1142/9789814616072_0017
- [15] A. N. F. Utami, A. N. Saputra, C. N. Fariaty, A. F. Kusmin, M. T. A. Rahimallah, Burhanuddin, and H. Lawelai, “Multi-level governance readiness and regional policy capacity in supporting Indonesia’s new capital development,” *Frontiers in Political Science*, vol. 8, Feb. 16, 2026, Art. no. 1758903, doi: 10.3389/fpos.2026.1758903.
- [16] A. Sadat and Muh. A. Basir, “Smart city and e-government as drivers of community involvement in urban governance: the mediating role of digital literacy,” *Frontiers in Sustainable Cities*, vol. 7, Mar. 25, 2026, Art. no. 1707608, doi: 10.3389/frsc.2025.1707608.
- [17] Ismaniah and I. Sastrodiharjo, “Smart governance and digital transformation in local public services: A systematic analysis of adaptive governance in the digital era,” *International Journal of Advanced Multidisciplinary*, vol. 4, no. 3, Oct.–Dec. 2025, doi: 10.38035/ijam.v4i3.1399.
- [18] O. L. Rua, M. Arias-Oliva, and Z. Shu, “Smart cities and open innovation: what is known, how it is known and future agenda,” *Discovery Sustainability*, vol. 7, p. 293, 2026, doi: 10.1007/s43621-025-02470-5.
- [19] S. Hidayat, D. Tambunan, and Y. Haning, “Unjust by default: The political economy of Indonesia’s local government policy on infrastructure development,” vol. 10, no. 2, doi: 10.1177/20578911241260442.
- [20] Syafarudin and A. Haris, “Digital transformation in public services: A study of e-government implementation in Indonesia,” *International Journal of Law and Society*, vol. 2, no. 4, pp. 169–179, Nov. 2025, doi: 10.62951/ijls.v2i4.797.
- [21] A. Shahin, M. Polonsky, and L. C. Wood, “Institutional drivers and barriers in sustainable procurement: A systematic review and total interpretive structural modelling analysis of local government,” *Industrial Marketing Management*, vol. 136, Jul. 2026.
- [22] A. Susanty, N. B. Puspitasari, D. Pujotomo, B. Purwanggono, and M. S. Akbar, “Overcoming barriers to green procurement: Insights from an integrated model of decision-making trial and evaluation laboratory-interpretive structural modelling in logistics industry,” *Journal of Transport and Supply Chain Management*, vol. 20, Jan. 2026, doi: 10.4102/jtscm.v20i0.1218.
- [23] L. C. Birleanu, F. Lungu, and C. Birleanu, “Leveraging centralized procurement for digital innovation in higher education: Institutional capacity and policy gaps in Romania,” *Administrative Sciences*, vol. 15, no. 8, p. 317, 2025, doi: 10.3390/admsci15080317.
- [24] I. Perwira, S. D. Harijanti, M. Susanto, and M. Y. Adhihernawan, “Capital city relocation in Indonesia: compromise failure and potential dysfunction,” *Cogent Social Sciences*, vol. 10, no. 1, 2024, doi: 10.1080/23311886.2024.2345930.
- [25] H. Jamrudin, Y. Widowaty, I. Satriawan, N. Prasetyoningsih, and F. Rettob, “Legal reform in the relocation of Indonesia’s capital: Challenges and implications,” *Journal of Law and Legal Reform*, vol. 6, no. 4, Oct. 2025, doi: 10.15294/jllr.v6i4.21111.
- [26] E. Struckell, D. Ojha, P. C. Patel, and A. Dhiri, “Strategic choice in times of stagnant growth and uncertainty: An institutional theory and organizational change perspective,” *Technological Forecasting and Social Change*, vol. 182, Sep. 2022.
- [27] I. Syafi’i, D. Suryani, S. Satriani, D. Aulia, A. Dhiaulhaq, and P. Y. Adaba, “Displaced by progress: The new capital development and the powers of exclusion in Balikpapan Bay, Indonesia,” *Ocean & Coastal Management*, vol. 269, p. 107801, Oct. 2025, doi: 10.1016/j.ocecoaman.2025.107801.
- [28] I. F. Aldhi, F. Suhariadi, E. Rahmawati, E. Supriharyanti, D. Hardaningtyas, R. Sugiarti, and A. Abbas, “Bridging digital gaps in smart city governance: The mediating role of managerial digital readiness and the moderating role of digital leadership,” *Smart Cities*, vol. 8, no. 4, p. 117, 2025, doi: 10.3390/smartcities8040117.
- [29] Y. Bozkurt, A. Rossmann, Z. Pervez, and N. Ramzan, “Assessing data governance models for smart cities: Benchmarking data governance models on the basis of European urban requirements,” *Sustainable Cities and Society*, vol. 121, Jul. 2025.
- [30] K. Sayed, A. G. Abokhalil, M. Aref, M. M. Almalki, and M. A. Mossa, “Digital twin-enabled urban systems for sustainable and resilient futures: A global urban science perspective,” *Sustainable Futures*, vol. 11, Jun. 2026.