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Comparing digital public service innovation in urban and rural space: evidence from Indonesia public service innovation competition 2014-2023

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Abstract

This study examines the landscape of digital public service innovation in Indonesia, focusing on a comparison of developments in urban and rural local governments from 2014 to 2023. Using a comparative approach integrated with a systematic search strategy guided by the PRISMA flowchart, this study analyzed 990 documents from the Ministry of Administrative and Bureaucratic Reform's innovation competition, with 170 documents meeting the inclusion criteria based on the title and description of digital public service innovations and the level of government for in-depth content analysis. Findings reveal distinct patterns in digital public service innovation. Local governments show a stronger emphasis on interactive rather than static services, enhancing user engagement, while district governments demonstrate a gradual but growing shift toward interactive solutions. External innovations outnumber internal ones, indicating a priority on citizen-oriented services, yet raising concerns about institutional digital capacity. Furthermore, independent innovation dominates over collaborative efforts, reflecting a lack of cross-sector collaboration in digital governance. This finding highlights the need for a balanced approach that integrates interactivity with accessibility, strengthens internal digital capacity, and encourages collaborative innovation. The study is limited by its reliance on secondary competition data, which may overlook informal initiatives, as well as interpretive bias in document-based categorization. It also does not analyze causal mechanisms such as leadership or bureaucratic culture, and its focus on Indonesia limits its generalizability. Future research should employ qualitative and cross-country comparative methods to deepen and broaden the findings.

Keywords: *digital public service, innovation, urban, rural*

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Introduction

The rapid advancement of technology and the growing digitalization of public administration have fundamentally transformed the delivery of public services. This transformation has given rise to Digital Public Service Innovation (DPSI), which aligns closely with the evolution of e-government (Attour & Chaupain-Guillot, 2020). As digital transformation continues to reshape governance, understanding how these innovations unfold across different geographical contexts—particularly in urban and rural settings—becomes critical. This study explores DPSI within Indonesia's diverse socio-economic and geographical landscape, analyzing the development of DPSI municipal and regency governments.

Indonesia, an archipelagic nation at the heart of Southeast Asia, exhibits a stark contrast between its densely populated urban centers and its remote rural areas. A persistent digital divide between these regions remains a major challenge, exacerbating

disparities in access to public services (Hadi, 2018). While digital innovation has the potential to reduce such inequalities and enhance service accessibility, its benefits are not uniformly distributed across all social groups. Furthermore, limited government innovation capacity can lead to uneven outcomes, reinforcing existing disparities rather than mitigating them (Hening & Kumara, 2019)

Urban areas, equipped with stronger financial resources and more advanced technological infrastructures, are often perceived as hubs of digital innovation. Rath (2016) highlights that per capita income growth and the urban-rural population ratio are key drivers of a country's digitalization level, suggesting that urbanization fosters greater digital innovation. However, this relationship is complex. Urban sprawl, for example, can negatively affect innovation productivity, as high land and property costs in dense urban areas may force innovative firms to relocate to less compact regions, making it difficult for small businesses to thrive (Hamidi & Zandiatashbar, 2019).

Conversely, rural areas face structural challenges in adopting digital innovations due to limited connectivity and resource constraints. Nevertheless, digital financial inclusion has shown potential in narrowing the urban-rural income gap, demonstrating that digital tools can help bridge disparities, albeit with limitations (Ji et al., 2021) Additionally, (Mas-Verdú et al., 2016) argue that despite geographical disadvantages, rural organizations can still foster innovation by integrating regional innovation indicators with an urban-rural typology to develop tailored strategies.

Recognizing these differences, municipal and regency governments implement distinct approaches to DPSI. While urban governments tend to focus on digitalization and governance efficiency, rural governments prioritize community-driven innovation and rural revitalization to address local challenges (Prasetyanti & Susilatun, 2020; Sutriadi et al., 2022; Yin et al., 2022). The effectiveness of these strategies is influenced by variations in resources, infrastructure, and community needs.

This study systematically compares DPSI as implemented by municipal and regency governments in Indonesia from 2014 to 2023. At the core of this research is the intersection of digital inequity and innovation, shaped by socio-demographic, economic, and geographic factors unique to each setting. By analyzing these dynamics, this study aims to provide a nuanced understanding of how DPSI impacts diverse communities across Indonesia (Muluk et al., 2021).

While previous studies have extensively examined public service innovation (PSI) in Indonesia—focusing on its determinants, processes, outcomes, impacts, and institutionalization (Kusumasari et al., 2019; Muluk et al., 2021; Pradana et al., 2023; A. B. Pratama, 2019; Roziqin et al., 2024)—a critical gap remains in the comparative understanding of innovation arenas (internal vs. external) and types of innovation. For instance, the case of Singapore illustrates a strategic shift in PSI emphasis from internal administrative efficiency toward citizen-facing innovations (Cinar, Demircioglu, et al., 2024). Meanwhile, a comparison between Thailand and South Korea highlights how administrative and technological contexts shape divergent innovation pathways (Suchitwarasan et al., 2023) Furthermore, cross-national studies involving Italy, Japan, and Turkey underscore the importance of national contextual factors—such as governance structure, institutional capacity, and cultural values—in shaping the nature and trajectory of PSI (Cinar et al., 2024).

This study addresses that gap by investigating urban and rural local governments as distinct innovation arenas and DPSI as the innovation type. Through comparative analysis, it aims to identify patterns that reveal the characteristics and

strategic approaches underpinning DPSI in different administrative contexts, contributing to the broader discourse on digital governance and innovation.

Research Methods

The researchers employ a comparative approach by analyzing public service innovation across different contextual settings, representing both rural and urban areas. This approach integrates both quantitative systematic review techniques and qualitative content analysis to rigorously analyze data drawn from the Ministry of Administrative and Bureaucratic Reform, explicitly focusing on report of Top 99 Public Service Innovation Competition spanning the years 2014 to 2023.

The Ministry of Administrative and Bureaucratic Reform (Kemenpan-RB) serves as the exclusive and authoritative repository for Indonesian Public Service Innovation data, accessible through its official platform (https://sinovik.menpan.go.id/). This repository stands out for its unparalleled reliability and comprehensiveness, making it an indispensable resource for scholarly investigations in this domain. Each year, Kemenpan-RB systematically compiles and ranks public service innovation proposals submitted by government institutions at all administrative levels. These proposals undergo rigorous evaluation by external assessors, culminating in an annual ranking of the top 99 public service innovations in Indonesia.

Given that the dataset is derived exclusively from the best-ranked innovations, it aligns closely with best practice research (Bretschneider, 2004), which emphasizes the examination of exemplary models to derive broader insights. Furthermore, this approach is consistent with the principles of Positive Public Administration (PPA), as it focuses on highlighting successful innovations and their contributions to governance improvements (Van Ostaijen & Jhagroe, 2022). Thus, leveraging this dataset enables a comprehensive analysis of cutting-edge public sector innovations while offering valuable insights into the evolving landscape of digital public service innovation in Indonesia.

Researchers employed the PRISMA flowchart as quantitative systematic review to select relevant documents systematically (see Figure 1). The employed of a PRISMA flowchart already tested and exploited by Sujarwoto et al., (2022) used PRISMA flowchart to search systematically COVID-19 related mHealth apps in Indonesia. By adhering to the identification and screening phases, this study ensures a comprehensive and accountable data selection process.

In the identification phase, a search for all reports from 2014-2023 yielded 990 instances of innovation. The next screening phase, at the first round, researches conducted a screening process based on the title and description of these reports to assess whether the innovations conformed to the classification of digital innovation in the public sector context. Given the research's specific focus on digital public service innovation, the adopted definition of digital innovation in the public sector aligns with the concept of e-government implementation (Attour & Chaupain-Guillot, 2020). The definition of e-government encompasses the implementation, diffusion, and utilization of Information and Communication Technologies (ICT) within public administration, fostering innovative methods for information dissemination and public service delivery (OECD, 2003). In summary, implementing e-government practices within the public service domain, spanning various digital tools such as websites, applications, and other e-government instruments, defines digital public service innovation. The defined parameters led to the exclusion of 334 innovations needed to meet the digital public service innovation criteria.

The second round of screening phase, researches classify the reports based on the government type. The scheme categorized the level of government associated with the production of digital public service innovations, distinguishing between services for urban and rural areas. The regency government in Indonesia typically epitomizes rural regions, encompassing expansive territories and relying heavily on traditional economic activities such as agriculture, fishing, and livestock farming. In contrast, the municipal government usually represents urban areas, characterized by smaller geographical scopes but stronger dependency on modern economic sectors, particularly industry, trade, and manufacturing (Munandar et al., 2018). This rural–urban distinction aligns with the argument of (Prasojo, Eko & Holidin, Defny, 2013) who emphasize that urban features generally characterize municipalities (cities), while rural features characterize regencies.

The researchers identified a total of 170 instances of public service innovation in both rural and urban areas. This limited count can be attributed to the data set's inclusion of innovations exclusively within specific levels of government, namely the central and provincial governments, thereby omitting other potential sources of innovation within the public service sector. Consequently, this process retained 170 reports included for further review and subsequent content analysis.

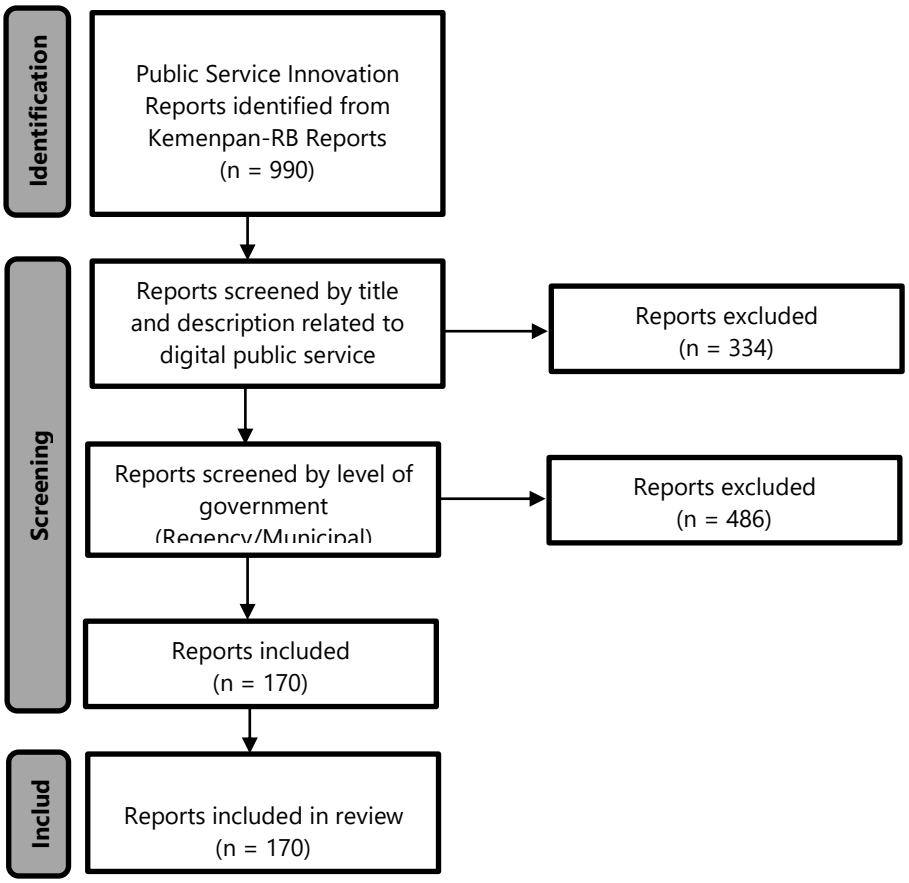

Figure 1. The Selection Process
Source: processed by author

The research method also employed qualitative content analysis to examine 170 documents for further analysis, utilizing a structured coding scheme as outlined in Table 1.

Table 1. Coding Scheme

Government Level	Digital Public Service Innovation Type					
City/Regency	**Static**	**Interactive**	**Internal**	**External**	**Cooperation**	**Independent**
Number of digital public service innovations produced by the City/ Regency Government	Number of digital innovations that utilize and implement information technology with one-way mechanisms without interaction between providers and users	Number of digital innovations that use and implement information technology with a two-way mechanism involving interaction between providers and users.	Number of digital innovations for internal organizational purposes	Number of digital innovations for public benefit.	Number of digital innovations created and implemented in collaboration with other stakeholder.	Number of digital innovations created and implemented independently without involving other stakeholder.

Source: processed by author

Table 2. Coding Vignete Example from Public Service Innovation Competition 2014

Innovation	Government Level	Static	Interactive	Cooperation	Independent	Internal	External
Surabaya City Education Agency Online Report Card	City Government	0	1	1	0	0	1
GRMS Surabaya City	City Government	1	0	0	1	0	1
One-Stop Service Poverty Alleviation in Sragen Regency	Regency Government	0	1	1	1	0	1

Source: processed by author

The coding scheme extended its classification criteria to delineate the types of digital public service innovations generated by governmental entities. These categories encompass user interactivity (static or interactive), the focus (internal or external), and collaborative nature (cooperation or independence). The categories are constructed by the foundation of the ideal type of digital service, First, the user must experience interactivity on digital service rather than static. Second, the focus of digital service must prioritize the external side of organization such as the user or public rather than internal side of organization such as their management and finance. Third, at the era of collaborative action that leads to better resolving wicked problem, the digital service must invite, share, and manage the resources from the other organization or stakeholder rather than do everything by exploiting self resources. Several studies already use the categories to assess ideal type of digital governance and public service innovation (Milakovich, 2021; Pratama et al., 2023, 2024). To illustrate the application of

these coding classifications, table 1 provides the coding scheme and table 2 provides a detailed example of the analysis conducted within these three discerning dimensions.

Results and Discussion

The Landscape of Digital Public Service Innovation in Urban and Rural Indonesia

Over the ten years from 2014 to 2023, figure 2 presents below a dynamic picture of innovation production by local governments in Indonesia. The type of government entity producing the innovations dictates their categorization into two distinct groups: Regency Governments for rural areas and Municipal Governments for urban areas.

In the early years of 2014 and 2015, Municipal Governments took the lead in innovation production, surpassing Regency Governments by a notable margin. However, as we move into 2016, a shift occurs, with Regency Governments contributing more innovations than Municipal Governments. This trend continued for several years, with Regency Governments consistently demonstrating robust innovation production. Notably, in 2022, Regency Governments made a substantial leap, contributing 19 innovations, while Municipal Governments produced 10. The pattern continues in 2023, Regency Government contributed 16 innovations, while Municipal Government produced 13 innovations. The total innovation count for each year is also noteworthy. In some years, such as 2016, the overall production of innovations dipped to only 6, while in others, like 2022 and 2023, it surged to 29.

This variation in annual totals underscores the dynamic nature of innovation efforts within local governments. The broader significance of these results lies in their potential to inform policy and research. The fluctuations in innovation production suggest that innovation ecosystems may vary year by year, and understanding the underlying factors driving these variations can be crucial for policymakers seeking to foster innovation in both urban and rural areas.

Furthermore, the total innovation count, revealing that Regency Governments collectively produced more innovations (99) than Municipal Governments (71) during this period, implies that rural areas exhibited higher overall innovation productivity. This observation could spur further investigation into the reasons behind this discrepancy and inform strategies to promote innovation in urban areas.

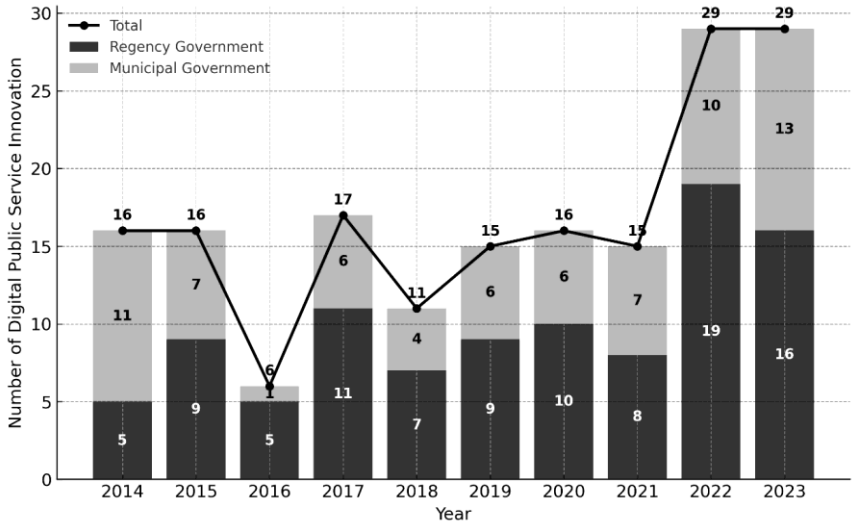

Figure 2. Digital Public Service Innovation Production in Regency and Municipal Government
Source: data analysis, 2024

The total calculation of the innovation type in both governments level is meticulously organized by year, from 2014 to 2023, with a summary at the figure 4. The table's structure allows for a detailed analysis of innovation types, both in terms of their interaction levels (static or interactive) and their scope (internal or external), as well as the collaborative nature of these innovations (cooperation or independence).

Throughout the observed period, a discernible array of trends and patterns in digital public service innovation has manifested within Regency and Municipal Governments. An analysis of aggregate data reveals a pronounced proclivity for certain types of innovations. Specifically, these governmental entities have collectively implemented 25 static and 145 interactive innovations, indicating a substantial predilection for dynamic user engagement mechanisms over static information services.

In terms of the orientation of innovation efforts, there is an equal contribution of 24 internal innovations, juxtaposed with a significantly higher count of 146 external innovations, underscoring a strategic emphasis on outward-facing initiatives that interact with the citizenry and external stakeholders.

Furthermore, the data delineates the nature of collaborative versus autonomous innovation endeavors, with 52 instances of cooperative innovations and a more substantial 118 instances of independent innovations. These figures elucidate the innovation milieu within the administrative frameworks of urban and rural governance, suggesting a robust inclination towards fostering digital public service innovation. Notably, there is a discernible preference for interactive innovations, which facilitate active user participation over passive information dissemination. Additionally, there is a tendency to prioritize external innovations that extend beyond the internal machinations of government operations. Lastly, the data indicates a propensity for independent innovation actions, which may reflect a strategic choice for singular initiative over collaborative ventures in the pursuit of digital transformation.

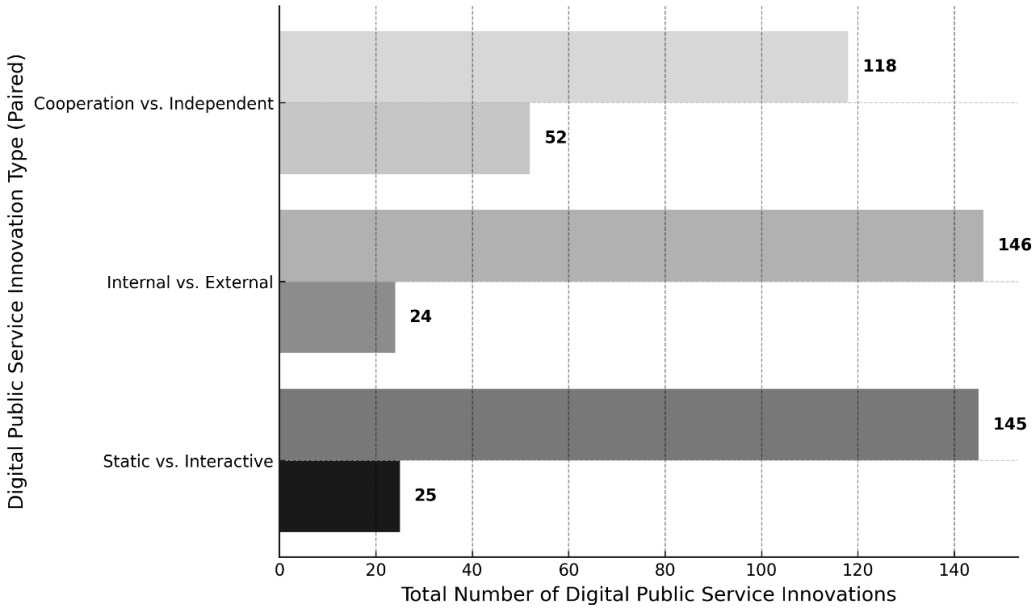

Figure 4. Digital Public Service Innovation Production Type in Regency and Municipal Government

Source: data analysis, 2024

Contrasting Digital Public Service Innovation in Urban and Rural Indonesia: User Interactivity, Focus of Innovation and Collaborative Nature

The comparison between static and interactive digital public service innovations in municipal and regency governments from 2014 to 2023 highlights a significant shift towards greater user interactivity (figure 5). Static digital services, which primarily provide one-way information such as government announcements, downloadable forms, and general regulations, have remained minimal in both municipal and regency governments. In contrast, interactive services, which enable user engagement through features like online applications, chatbots, and digital service platforms, have grown substantially over the years.

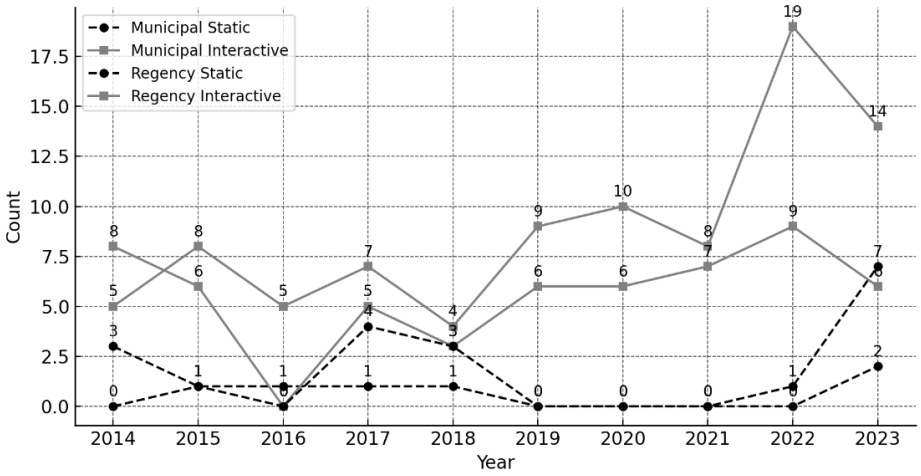

Figure 5. User Interactivity Comparison
Source: data analysis, 2024

Municipal governments implemented a total of 15 static innovations, while their interactive services reached 56. This indicates a clear preference for engaging citizens rather than simply disseminating information. A similar trend is evident in regency governments, where static innovations totaled only 10, whereas interactive services surged to 89. The data suggests that regency governments, which often serve more dispersed populations, have prioritized interactivity to bridge geographical barriers and improve public access to services.

Yearly trends further emphasize this transition. In both municipal and regency governments, static innovations remained consistently low, reflecting their diminishing role in digital governance. The shift towards interactive services became especially prominent from 2019 onwards, with both government levels increasing their efforts to integrate user-friendly digital solutions. Regency governments, in particular, showed a more drastic adoption of interactive services, with a sharp rise in 2022 and 2023, likely driven by the demand for more accessible public services post-pandemic.

Several examples of interactive digital public service innovations can be seen in various regions. In Kabupaten Batu Bara (Regency), the local government developed Rumah Kemasan Kabupaten Batu Bara, a digital-based packaging house aimed at increasing sales and improving the economy of MSMEs during the Covid-19 pandemic. Meanwhile, in Kota Cimahi (Municipal), the municipal government introduced Makerspace Digital Kreatif, a digital workspace designed for creativity, innovation, and collaboration in the digital field.

The dominance of interactive innovations underscores the broader move towards user-centric governance, where digital tools are not only used to provide

information but also to facilitate direct interaction between citizens and government institutions. Regency governments appear to be more proactive in this transition, possibly due to the necessity of ensuring service accessibility across wider geographical areas. Municipal governments, while also prioritizing interactivity, have demonstrated a more gradual approach in comparison.

Overall, the decline in static innovations and the rapid increase in interactive digital services reflect a fundamental change in how public service delivery is designed. The focus on interactive solutions signals a commitment to improving citizen engagement, accessibility, and efficiency in governance. Moving forward, digital transformation efforts should continue emphasizing user experience, ensuring that services remain responsive to the evolving needs of the public.

The comparison between internal and external digital public service innovations in municipal and regency governments from 2014 to 2023 highlights the different focuses of innovation in public service delivery (figure 6). Internal innovations refer to digital services designed primarily for improving government operations, such as internal management systems, administrative automation, and digital record-keeping. In contrast, external innovations are directed towards public-facing services, enabling citizens to access government services more efficiently through digital platforms.

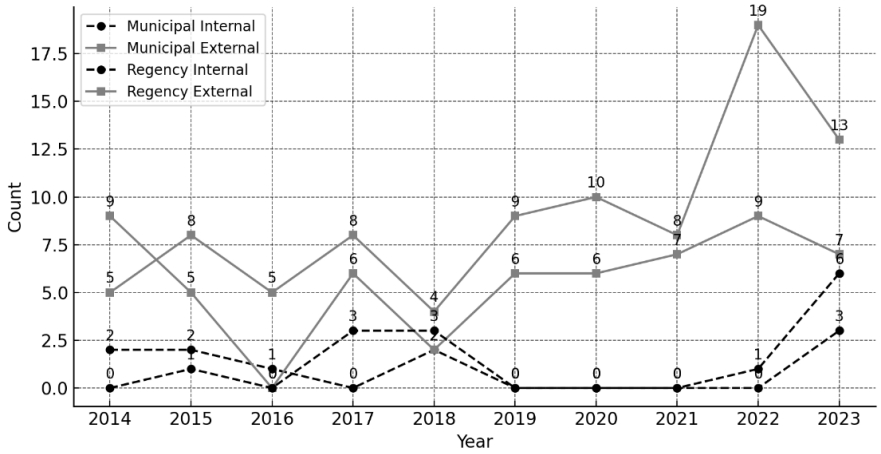

Figure 6. Focus Comparision
Source: data analysis, 2024

Municipal governments developed a total of 14 internal innovations, whereas external innovations reached 57. This significant gap suggests that municipalities prioritized improving citizen engagement and service accessibility over enhancing internal bureaucratic efficiency. The trend is even more pronounced in regency governments, where only 10 internal innovations were recorded, compared to 89 external innovations. This disparity indicates that regency governments, which often serve broader and more geographically dispersed populations, placed a greater emphasis on outward-facing digital services to bridge accessibility gaps.

Examining the yearly data, internal innovations remained consistently low in both municipal and regency governments, showing minimal fluctuations over the years. This suggests that internal reforms in digital public services were not a primary focus, possibly due to bureaucratic constraints or a stronger emphasis on meeting immediate public demands. On the other hand, external innovations exhibited significant growth, particularly after 2019, reflecting a growing commitment to enhancing digital access to

government services. The sharp rise in external innovations in both municipal and regency governments during 2022 and 2023 may have been influenced by the increasing demand for remote services following the COVID-19 pandemic.

Several examples of digital public service innovations aimed at external stakeholders have emerged across various regions. In Kabupaten Sleman, the local government developed Inovasi LASAMBA (Layanan Sambang Warga), a service designed to enhance the accessibility of social services, ensuring they are more easily reachable for marginalized communities. Meanwhile, in Kota Cilegon, the municipal government introduced SMART GENRE (Sistem Manajemen Aksi Remaja Terampil Generasi Berencana), a platform that improves access to high-quality, equitable information for teenagers, particularly regarding the risks of early marriage.

Regency governments displayed a more aggressive approach in adopting external innovations, likely due to the necessity of overcoming geographical challenges and improving service delivery to rural areas. Municipal governments, while also prioritizing external digital solutions, followed a steadier and more gradual path. The limited growth in internal innovations across both government levels suggests that while digital transformation efforts have been substantial, internal government processes may still rely on traditional methods, slowing the overall modernization of administrative functions.

Overall, the dominance of external digital public service innovations reflects a strong user-centric approach in public service digitalization. However, the relatively low adoption of internal innovations suggests potential inefficiencies within government operations that could impact service delivery in the long run. Moving forward, a more balanced approach—where both internal efficiency and external accessibility are enhanced—could lead to a more sustainable and effective digital transformation in public service governance.

The comparison between cooperative and independent digital public service innovations in municipal and regency governments from 2014 to 2023 highlights differences in the collaborative nature of digital transformation efforts (figure 7). Cooperative innovations involve partnerships between governments, private sector entities, or civil society to develop and implement digital solutions, whereas independent innovations are initiatives developed solely by the respective government bodies without external collaboration.

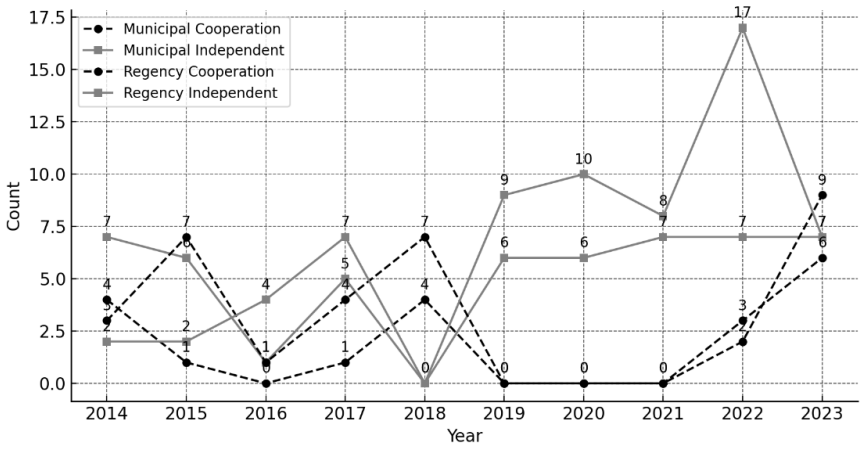

Figure 7. Collaborative Nature Comparison
Source: Data Analysis, 2024

Municipal governments recorded a total of 19 cooperative innovations, while independent innovations reached 52. This indicates that while some collaborative efforts existed, municipalities primarily focused on independently developed digital solutions. The pattern is similar in regency governments, where cooperative innovations totaled 33, compared to 66 independent innovations. Despite regency governments engaging in more collaborative projects than their municipal counterparts, independent innovations still dominated their digital public service landscape.

The yearly data suggests that independent innovations were consistently more prevalent across both government levels. This trend implies that digital transformation efforts were often pursued within government structures rather than through partnerships. However, cooperative innovations did see notable increases in certain years, particularly in 2022 and 2023, reflecting a potential shift towards more collaborative digital governance strategies. This rise could be attributed to growing recognition of the benefits of public-private partnerships in enhancing technological capabilities and resource-sharing in digital service delivery.

Regency governments displayed a slightly stronger inclination toward cooperative innovation, possibly due to the necessity of leveraging external expertise and funding to overcome geographical and infrastructural challenges. Meanwhile, municipal governments, with their relatively more developed administrative structures, appeared to rely more on their internal capacities to drive digital initiatives independently.

Several examples of digital public service innovations that has a collaborative nature have emerged across various regions. In Kabupaten Lamongan (Regency), the local government developed Pasar Online Lamongan (POL) as Efforts to sustain economic trade activities in markets during the enforcement of public activity restrictions (PPKM) amid the Covid-19 pandemic in 2020. Meanwhile, in Kota Surabaya (Municipal), the municipal government introduced SAYANG WARGA (Sistem Layanan dan Pendampingan Warga Surabaya) to integrates factual health data for each resident enables a more targeted response to field issues. Data input is not limited to civil servants but also involves Kader Surabaya Hebat (KSH) and the Family Assistance Team, who are given access to report local conditions directly. This collaborative approach enhances public health responsiveness and accuracy.

The overall dominance of independent innovations suggests that both municipal and regency governments have largely pursued self-reliant digital transformation strategies. While this approach allows for greater control and customization, it may also limit access to external expertise, funding, and technological advancements that partnerships can provide. The increase in cooperative innovations in recent years signals a gradual shift towards more collaborative efforts, which could lead to more robust, scalable, and sustainable digital public service solutions. Moving forward, balancing independent and cooperative innovations will be essential for effective digital governance. While maintaining internal digital development is important, expanding partnerships with private sector entities, academic institutions, and civil society organizations could accelerate innovation, enhance service quality, and improve the overall impact of digital public service delivery.

The landscape shows the higher total innovation count among Regency Governments relative to Municipal Governments suggests that rural jurisdictions may exhibit different but comparably productive innovation dynamics. International evidence shows that rural areas often innovate through community-led/grassroots initiatives, frugal (necessity-driven) solutions, and collaborative governance arrangements that compensate for resource constraints and service access gaps (OECD, 2022; Seyfang & Smith, 2007; Sørensen & Torfing, 2016). European "Smart Villages" and the LEADER program likewise document how rural communities use digital and social innovation to upgrade public services and governance capacity, even with leaner resources (European Court of Auditors, 2022; European Parliamentary Research Service, 2021). Classic public-sector innovation work also emphasizes collaboration as a driver of service innovation under constraint, a pattern consistent with rural government contexts (Hartley, 2005; Sørensen & Torfing, 2016).

The further analysis of digital public service innovations in municipal and regency governments from 2014 to 2023 reveals critical patterns in user interactivity, focus of innovation, and collaborative approaches. These insights provide a deeper understanding of how digital transformation has been implemented in different government levels and highlight the challenges and opportunities for advancing public service delivery through digital means.

User Interactivity: Static vs. Interactive Innovations

The comparison of static and interactive innovations underscores a fundamental shift in how digital services are designed to engage users. The dominance of interactive innovations over static ones in both municipal and regency governments suggests a strong commitment to enhancing user engagement and responsiveness. This aligns with broader digital governance trends that emphasize participatory service models, where citizens are not merely recipients of information but active users of digital platforms (Carlsson et al., 2023; Wohlers & Bernier, 2016; Zhang & Kaur, 2024). The significantly higher number of interactive innovations in both government levels indicates a growing recognition that effective digital services require dynamic, two-way communication rather than simple one-way information dissemination.

However, the persistent gap between the two suggests that some government institutions may still face challenges in fully implementing interactive systems. This could be due to limited technical capacity, financial constraints, or resistance to change within bureaucratic structures (Cunningham et al., 2011; Datta et al., 2020; Sigurjonsson et al., 2024). Municipal governments, generally operating in more urbanized settings with better digital infrastructure, might find it easier to implement interactive services compared to regency governments, which often serve rural and less technologically connected populations. The increase in interactive innovations in recent years signals a positive trajectory, but ensuring their accessibility and usability remains a crucial challenge, particularly in regions with lower digital literacy.

Focus of Innovation: Internal vs. External Approaches

The overwhelming dominance of external innovations over internal ones in both municipal and regency governments reflects a strong emphasis on citizen-facing digital transformation. This trend aligns with the increasing demand for digital government services that provide convenience, transparency, and accessibility. Governments have prioritized digital solutions that directly serve the public, such as online service applications, complaint-handling systems, and e-governance platforms. The rapid expansion of external innovations, particularly post-2019, suggests that external-facing

digital services have been crucial in modern governance strategies (Al-Sobhi et al., 2012; Mihai et al., 2022; Zhang & Kaur, 2024).

However, the comparatively low number of internal innovations raises concerns about the long-term sustainability of digital public services. Efficient external service delivery is often contingent upon well-functioning internal systems. A lack of digital transformation within government operations—such as internal workflow automation, digital records management, and AI-driven decision-making—can create inefficiencies, undermining the effectiveness of citizen-facing innovations (Daßler et al., 2024; Eynon & Dutton, 2007; Gebrihet & Pillay, 2021). The relatively stagnant development of internal innovations suggests that many government bodies still rely on traditional bureaucratic processes, which could limit the full potential of digital governance. Strengthening internal digital infrastructure is essential to ensuring that external innovations function effectively and sustainably.

Collaborative Nature: Cooperative vs. Independent Innovations

The predominance of independent innovations over cooperative ones suggests that municipal and regency governments have largely pursued self-sufficient approaches in digital transformation. While this allows for greater autonomy and customization, it also presents challenges in terms of resource allocation, technological advancement, and scalability. The limited engagement in cooperative innovations implies that many digital initiatives are developed in isolation, potentially restricting their long-term viability and effectiveness.

Regency governments displayed a slightly higher tendency toward cooperative innovations compared to municipal governments, likely due to their need to leverage external expertise and funding to address infrastructural and administrative challenges. However, the overall low number of cooperative projects suggests that both government levels could benefit from greater collaboration with private sector entities, academic institutions, and civil society organizations. The increase in cooperative innovations in 2022 and 2023 indicates a gradual shift toward recognizing the value of partnerships, possibly driven by the growing complexity of digital governance and the need for more advanced technological solutions.

Collaborative innovation can enhance the quality, efficiency, and scalability of digital public services by integrating diverse expertise, technological capabilities, and financial resources (Anshari & Hamdan, 2023; Bharosa et al., 2020; Callens, 2023; Callens & Verhoest, 2024; Yuan, 2024). Governments that embrace public-private partnerships and cross-sector collaborations can accelerate digital transformation while ensuring that innovations are adaptable, user-centric, and sustainable. The challenge lies in balancing independent initiatives with cooperative efforts to maximize the strengths of both approaches.

Policy Implications

The findings from these three perspectives highlight an ongoing evolution in digital public service innovation but also point to critical gaps that need to be addressed. While user interactivity has been prioritized, ensuring accessibility and inclusivity in interactive services remains a challenge. The emphasis on external innovations, while beneficial for citizen engagement, must be complemented by stronger internal digital transformation to ensure efficiency and sustainability. Lastly, while independent innovation dominates, expanding cooperative efforts can bring greater expertise, funding, and scalability to digital initiatives.

From a theoretical standpoint, these findings align with the digital-era governance model, which emphasizes user-centered services, technology-driven efficiency, and networked governance (Hien et al., 2024; Menon, 2024; Misra et al., 2018; Ravšelj et al., 2022; Rekunenko et al., 2025). However, the imbalance between external and internal innovations, as well as the limited collaboration, suggests that municipal and regency governments may still be operating within a transitional phase of digital governance rather than a fully integrated smart governance model.

To achieve a more mature and sustainable digital governance framework, policymakers should consider the following strategies: (1) increasing investment in internal digital infrastructure to support efficient service delivery, (2) ensuring that interactive digital platforms are designed with accessibility in mind to bridge the digital divide, and (3) fostering stronger multi-sector collaborations to leverage technological advancements and ensure long-term sustainability. Ultimately, digital public service innovation must evolve beyond fragmented and isolated initiatives. A holistic approach that integrates user interactivity, balanced internal-external development, and cooperative governance can create a more effective, inclusive, and future-ready digital public service ecosystem.

Conclusion

This study investigates the landscape of digital public service innovation in Indonesia, focusing on the comparative trajectories of municipal (urban) and regency (rural) governments from 2014 to 2023. Amidst challenges of policy uniformity and digital disparities, the research highlights key trends in the evolution of digital governance at the local level. By systematically analyzing 170 selected documents from the Ministry of Administrative and Bureaucratic Reform's innovation competition, the study provides a nuanced understanding of digital transformation within diverse administrative contexts.

The findings reveal that municipal and regency governments have increasingly prioritized interactive over static innovations, emphasizing user engagement and real-time service delivery. However, gaps remain in ensuring accessibility and inclusivity, particularly in regions with lower digital literacy and technological infrastructure. Furthermore, the dominance of external innovations over internal ones suggests a strong focus on citizen-facing services, but it also raises concerns about the efficiency and sustainability of digital governance. Strengthening internal digital systems is crucial for supporting long-term innovation.

Additionally, while independent digital public service innovations prevail, the limited adoption of cooperative approaches signals missed opportunities for leveraging multi-sector expertise and resources. Encouraging stronger collaborations with the private sector, academia, and civil society could enhance the scalability and effectiveness of digital initiatives.

Overall, this study underscores the need for a more integrated and strategic approach to digital public service innovation in Indonesia. Policymakers should balance interactivity with accessibility, external innovation with internal digital capacity, and independent initiatives with cooperative efforts to build a more inclusive and sustainable digital governance framework. As local governments navigate the complexities of digital transformation, bridging technological and institutional disparities remains essential for ensuring that digital public services are both efficient and equitable across diverse regions.

Despite offering valuable insights into the landscape of digital public service innovation in Indonesia, this study has several limitations. First, the research relies on secondary data from the Ministry of Administrative and Bureaucratic Reform's innovation competition, which may not capture the full spectrum of digital innovations implemented at the local level, particularly informal or pilot initiatives that did not enter the competition. Second, while the study identifies trends over time, it does not provide an in-depth examination of the causal mechanisms driving the differences between municipal and regency governments, such as political leadership, financial constraints, or bureaucratic culture. Third, the categorization of innovation types (e.g., static vs. interactive, internal vs. external, cooperative vs. independent) is based on document analysis, which may be subject to interpretation bias. Further qualitative research, including interviews with policymakers and service users, could offer richer insights into how these innovations function in practice. Lastly, the study focuses on Indonesia, limiting the generalizability of its findings to other contexts. Future research could adopt a comparative approach by examining digital public service innovation across different countries or regions to identify broader patterns and best practices.

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