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Research Article

Public Service Innovation Based on Digital Transformation as an Effort to Realize Smart Governance

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Abstract: This research investigates how digital transformation contributes to innovation in public services as part of the move toward smart governance. The study employs a literature review approach by evaluating a variety of pertinent materials, which include global journals, scholarly books, and official publications from the years 2018 to 2025. Results show that digital transformation notably enhances the quality of public services regarding their efficiency, effectiveness, openness, and ease of access. The incorporation of technologies like e-government platforms, mobile apps, artificial intelligence, and big data analysis allows governments to provide services that are quicker and more responsive. Additionally, digital platforms foster public involvement by offering means for communication and participation in decision-making activities. Despite these advancements, there are still several obstacles to overcome, such as the digital divide, insufficient infrastructure, low levels of digital skills, and resistance to change within bureaucracy. These issues emphasize the need for cohesive strategies that include investment in technology, development of human resources, and regulatory assistance. The study concludes that digital transformation is vital for achieving smart governance; however, its effectiveness relies on the preparedness of infrastructure, institutions, and society to embrace digital advancements.

Keywords: Digital Literacy; Digital Transformation; E-Government; Public Service Innovation; Smart Governance

1. Introduction

Over the past two decades, advances in digital technology have revolutionized various aspects of life, from the economy and education to governance. Digitalization has not only transformed the way people interact but has also raised public expectations of government performance. Citizens now demand faster, more accessible, more transparent, and more responsive public services. Therefore, governments must abandon conventional methods and shift to digital-based, flexible, and innovative governance systems.

Digital transformation in government has become a necessity in the era of globalization and the Fourth Industrial Revolution. Many countries have integrated information and communication technology into administration and public services to improve bureaucratic efficiency and effectiveness. The concept of smart government has emerged as a new paradigm that emphasizes the use of digital technology, data, and public participation in the decision-making process. Smart government is not solely about technology, but rather how technology can achieve more inclusive and accountable governance.

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In Indonesia, steps toward smart governance are already evident through policies and programs that support the digitalization of public services. The implementation of the Electronic-Based Government System (SPBE) is a key strategy for creating integrated governance. Various government agencies have developed public service applications that facilitate citizens' access to population administration, business licensing, healthcare, and other services. This innovation demonstrates the government's commitment to improving the quality of public services through digital technology. However, implementing digital transformation in Indonesia still faces several complex challenges.

One of the main obstacles is limited technological infrastructure, particularly in remote areas lacking adequate internet access. This digital divide prevents some citizens from enjoying the benefits of digital-based services. Furthermore, low levels of digital literacy hinder the optimal use of available digital services. Challenges are not only external but also originate within the bureaucracy. Resistance to change remains a classic issue in bureaucratic reform. Some civil servants still maintain traditional mindsets and are not fully prepared to adapt to digital systems, hampering the pace of innovation in technology-based public services. Therefore, efforts are needed to increase the capacity of human resources through training and continuing education to keep pace with technological developments.

On the other hand, digital transformation offers significant opportunities to improve the quality of public services. The use of big data, artificial intelligence, and integrated information systems enables governments to make more accurate, data-driven decisions. Digital technology can also strengthen government transparency and accountability through systems that can be directly monitored by citizens, thereby increasing public trust. The concept of smart governance emphasizes the active role of citizens in the governance process. With the support of digital technology, citizens now have broader opportunities to contribute to policy-making, for example through online complaint platforms, social media, or other participatory applications. This participation not only strengthens policy legitimacy but also results in policies that are more responsive to community needs.

Furthermore, public service innovation driven by digital transformation creates budget and time efficiencies. Administrative processes that were previously time-consuming and expensive can now be completed more quickly and efficiently through digital systems. Digitalization also helps reduce maladministration practices such as extortion and abuse of authority, as services become clearer and better documented. Ultimately, the success of smart governance is determined not only by technology but also by collaboration between various stakeholders, including the government, the private sector, and the public.

This collaboration is key to creating a digital ecosystem that supports public service innovation. The government must act as a driving force, facilitating cross-sector collaboration to accelerate comprehensive digital transformation. This research aims to examine in detail how public service innovation triggered by digital transformation can help realize smart governance. Furthermore, this research aims to identify the challenges and opportunities that arise in implementing digital transformation in the public sector. It is hoped that the results of this study will contribute to the development of public service policies and practices that are more innovative, adaptive, and oriented to public needs in the digital era.

2. Literature Review

Digitalization in Public Services

Digitalization in the public sector refers to the comprehensive use of digital technology to transform the way government works, its organizational culture, and its service delivery model, making it more efficient and effective, meeting public expectations. According to Mergel et al. (2019), digitalization goes beyond simply shifting services to digital formats; it encompasses fundamental changes in how the government operates and interacts with the public. This requires a combination of technology, policy, and human resources to create a public service system that is responsive to the dynamics of the times.

Furthermore, Vial (2019) states that digitalization is a process aimed at improving organizational performance by overhauling structures, strategies, and capabilities through the use of digital technology. In the realm of public services, digitalization focuses not only on improving service quality but also on creating value for the community. The government is expected to provide services that are faster, more transparent, and more responsive to citizen needs by optimizing information and communication technology. Its implementation is usually seen through the development of e-government or electronic-based government systems. Janowski (2015) explains that e-government is the initial step in digitalization that seeks to increase administrative efficiency and facilitate access to public services. However, true digitalization goes beyond e-government, encompassing cross-sector integration, intelligent data utilization, and active citizen participation in government processes.

Meanwhile, the OECD (2020) emphasizes that the digitalization of public services must be user-centric. This means that the design and development of digital services must consider user needs, preferences, and experiences. This approach is crucial, as the success of digitalization is not solely measured by technological sophistication, but rather by how easily the service can be accessed and utilized by the wider community. However, the implementation of digitalization in the public sector is not without its challenges.

Cordella and Paletti (2019) identified organizational resistance to change, particularly within hierarchical and rigid bureaucracies, as a major obstacle. Limited technological infrastructure, a lack of employee digital competency, and data security issues are also significant obstacles. Therefore, a comprehensive strategy is needed to address these issues. On the other hand, digitalization offers numerous opportunities for the government to improve the quality of public services. By leveraging technologies such as big data, cloud computing, and artificial intelligence, the government can manage information more effectively and make data-driven decisions.

Sun and Medaglia (2019) argue that the use of data in digital government can strengthen transparency, accountability, and citizen participation in the policy-making process, which in turn increases public trust in government. Thus, the digitalization of public services is a complex process involving technological, organizational, and social dimensions. Its success depends heavily on the government's ability to manage change and collaborate with diverse stakeholders. Therefore, a strong commitment from the government and appropriate policy support are required for the digitalization process to run optimally and sustainably.

Smart Governance Concept

Smart governance is a crucial element in the evolution of smart cities, emphasizing the use of information and communication technology to improve the quality of government

management. According to Meijer and Bolívar (2016), smart governance goes beyond adopting digital technology, but also encompasses improvements in decision-making processes, transparency, and citizen participation in governance. Thus, smart governance combines technological innovation with modern democratic values. Nam and Pardo (2011) add that smart governance is part of the smart city ecosystem, emphasizing interactions between government, citizens, and the private sector to create value for the public.

Here, technology plays a role as a driver that facilitates cross-sector collaboration and supports the formation of a government that is more responsive to community needs. This demonstrates that smart governance focuses not only on efficiency but also on inclusivity and cooperation. Gil-Garcia et al. (2016) emphasize the importance of utilizing data and analysis in the decision-making process. The government is expected to be able to optimally manage and utilize data to produce evidence-based policies.

The use of big data and analytical tools provides an opportunity for the government to understand community needs more accurately, resulting in more appropriate policies. The concept of smart governance is also aligned with the principles of good governance, such as openness, accountability, effectiveness, and participation. The OECD (2019) states that the integration of digital technology in government can strengthen these principles by increasing access to public information and facilitating public oversight.

With digital systems, government processes become more transparent and can be directly monitored, reducing the risk of abuse of authority. However, the implementation of smart governance faces several challenges. Anthopoulos (2017) identified the digital divide as a major obstacle that can hinder public participation in technology-based government systems. Furthermore, data security and privacy issues are important concerns. Therefore, the government needs to provide adequate regulations and infrastructure to ensure safe and inclusive implementation.

On the other hand, smart governance opens up significant opportunities to improve the quality of public services and public trust in government. Bolívar (2018) points out that implementing smart governance can accelerate administrative efficiency while strengthening the relationship between government and citizens through better interactions. Digital technology makes it easier for citizens to provide direct feedback, enabling the government to respond more quickly and accurately. Overall, smart governance is a concept that integrates technology, policy, and citizen participation within a flexible, modern management framework.

The success of its implementation depends heavily on the government's readiness to manage change and its ability to build effective collaboration with various stakeholders. Therefore, a comprehensive and sustainable strategy is needed to ensure smart governance operates optimally in supporting inclusive and sustainable development.

Digital Technology-Based Public Service Innovation

Public service innovations that utilize digital technology are a concrete manifestation of digital transformation in government, with the primary goal of improving the quality of

services for citizens. These innovations encompass a variety of technologies, including mobile applications, integrated service portals, artificial intelligence (AI), and big data analytics. Criado et al. (2021) argue that digital innovation in public services emphasizes more than just technology, but also changes in how the government designs, manages, and delivers services to be more responsive, efficient, and aligned with public needs.

Furthermore, digital innovation provides opportunities for the government to provide faster and more accessible services without being limited by time and space. Linders (2012) stated that the digitalization of public services encourages a shift from traditional to collaborative models, where citizens are no longer merely recipients of services but actively participate in the process. This strengthens the relationship between government and citizens and creates a public service ecosystem that is more inclusive of public participation.

The use of mobile applications in public services has become one of the fastest-growing innovations in recent years. These applications allow citizens to access various services, such as population administration, health, education, and licensing, conveniently through smartphones. Alketbi et al. (2019) noted that mobile-based government applications (m-government) can improve service efficiency and provide a better user experience, as services can be accessed directly and personalized.

Furthermore, the development of integrated service portals is also a crucial strategy in digital public service innovation. These portals combine various services from multiple institutions into one central platform, allowing citizens to access them without having to switch systems. Janssen and Estevez (2013) demonstrated that service integration through integrated portals can improve bureaucratic efficiency, reduce process waste, and speed up service times.

Artificial intelligence (AI) is increasingly being applied in public services, for example through chatbots, recommendation systems, and automated data analysis. Sun and Medaglia (2019) explain that AI can help governments improve the quality of decision-making and provide more responsive and adaptive services. For example, chatbots can automatically answer citizen questions 24/7, improving service accessibility.

On the other hand, the use of big data analytics allows governments to process and analyze vast volumes of data to better understand public needs. Klievink et al. (2017) argue that the use of big data in the public sector can improve policy effectiveness and support data-driven decisions. With proper analysis, governments can identify patterns in citizen needs and design more relevant services. Despite offering many benefits, digital-based public service innovations also face challenges, such as limited infrastructure, data security, and gaps in digital literacy.

Therefore, a comprehensive and sustainable strategy is needed to ensure the optimal implementation of digital innovation. Appropriate policy support and collaboration between the government, the private sector, and the public are expected to make digital public service innovation a key driver for creating high-quality, inclusive, and sustainable public services.

3. Proposed Method

This research uses a literature review approach as the primary method to deeply examine the ideas, theories, and practices of innovation in public services triggered by digital transformation for the realization of smart governance. The literature review method was chosen because it provides researchers with broad insights through the analysis of a variety of relevant and up-to-date scientific sources. Data were drawn from leading international journals, academic books, scientific proceedings, and official reports from credible government agencies and international organizations.

The approach used was qualitative and descriptive; the researchers did not collect field data but instead analyzed previously published secondary data. Therefore, the focus of the research was on gathering information, grouping ideas, and interpreting existing findings to synthesize new knowledge. The literature review also enabled the researchers to identify trends, patterns, and research gaps related to the topic. The research emphasized systematic and structured principles so that the results could be scientifically accounted for.

Each source used was selected through a rigorous selection process based on topic relevance, publication quality, and novelty. This is crucial to ensure the analysis is based on valid and up-to-date references, especially given the rapid pace of digital technology development. Furthermore, this method provides researchers with the opportunity to compare various expert perspectives on digital transformation, smart government, and innovation in public services. By comparing these perspectives, researchers can gain a more comprehensive understanding and formulate more objective conclusions. Thus, a literature review is an ideal method for achieving both conceptual and analytical research objectives.

Research Procedures

The research stages in this literature review were carried out systematically through several interrelated steps. The first step involved determining the research topic and selecting keywords. At this stage, the researcher focused on digitalization, public service innovation, and smart government, using keywords such as "digital transformation," "public service innovation," "e-government," and "smart government." These keywords served as the basis for the literature search.

The second step involved gathering references from various trusted scientific databases, such as Scopus, Google Scholar, ScienceDirect, and SpringerLink. Researchers also utilized official documents from global organizations such as the OECD and the World Bank to supplement the data. The collection was conducted comprehensively to obtain diverse and high-quality sources.

The third step is to filter the literature based on specific criteria, namely relevance to the topic and publication year range. In this study, references were limited to 2018–2025 to ensure the timeliness of the information and must be highly credible, such as peer-reviewed journals or academic books from reputable publishers.

The fourth step involves data analysis and synthesis. Researchers read, understand, and categorize information from various sources. Analysis is conducted by identifying main ideas, comparing findings across studies, and identifying relationships between ideas. Next, synthesis integrates all the information into a structured and systematic framework.

The final step is to draw conclusions. Based on the results of the literature analysis and synthesis, the researchers formulate conclusions that answer the research questions and provide insight into the role of digital transformation in public service innovation and its contribution to achieving smart governance. They also identify challenges and opportunities that can inform further research and policymaking.

4. Results and Discussion

Resutlt

A literature review reveals that digital transformation has had a significant impact on improving the quality of public services in various countries, including Indonesia. Digitalization not only accelerates service procedures but also transforms public service delivery patterns from bureaucratic to more responsive and citizen-focused. Various technological innovations, such as online services, mobile applications, and integrated systems, have been proven to improve service accessibility and expand the reach of public services to previously hard-to-reach communities.

Furthermore, digital transformation has increased the efficiency and effectiveness of government administration. Processes that were once time-consuming and involved numerous bureaucratic stages can now be simplified through digital systems. For example, online-based services allow citizens to process administrative documents without having to visit service offices in person. This not only saves time but also lowers operational costs for both the government and citizens. Thus, digitalization creates a faster, more precise, and more efficient service system. Research also shows that the use of digital technology can strengthen transparency and accountability in the delivery of public services.

Digital systems allow for open public access to information on procedures, costs, and service times. Furthermore, the digital footprint recorded at each service stage facilitates bureaucratic monitoring and oversight. This indirectly reduces the potential for maladministration, such as corruption, extortion, and abuse of authority. Another significant finding is the increased public participation in government processes through digital platforms. Various channels such as social media, online complaint applications, and e-participation platforms provide opportunities for citizens to express their aspirations, criticisms, and suggestions directly to the government.

This creates more open two-way communication between the government and the public, and encourages the formation of more participatory and inclusive public policies. However, the study also identified several challenges in implementing digital transformation in public services. The digital divide is a major obstacle, as not all regions have adequate technological infrastructure. Furthermore, low levels of digital literacy prevent some groups from optimally utilizing digital services. Internally, bureaucratic resistance to change and a lack of staff competency are also inhibiting factors in the digital transformation process.

Discussion

This research confirms that digital transformation is a crucial element in improving the quality of public services and realizing modern governance. The increased efficiency and effectiveness brought about by digitalization demonstrates the strategic role of technology in simplifying bureaucratic procedures, which are often considered complex. This aligns with

the bureaucratic reform agenda, which emphasizes the need for fast, accurate, and results-focused public services. From a transparency and accountability perspective, digital transformation significantly contributes to creating a more open government. The wider dissemination of information allows citizens to directly monitor government performance.

With a well-documented digital system, every stage of service delivery can be tracked, thereby increasing public trust in the government. This situation demonstrates that technology is not merely a tool, but also an instrument for strengthening the principles of good governance. Furthermore, increased citizen participation through digital platforms indicates that digital transformation can encourage the creation of a more democratic government. Public involvement in the decision-making process is no longer limited by space and time, but rather allows for broader and more inclusive participation. This aligns with the concept of smart governance, which emphasizes collaboration between the government and the public in formulating more responsive public policies.

However, the challenges of implementing digital transformation cannot be ignored. The digital divide between urban and rural areas indicates an imbalance in access to technology. If not addressed appropriately, this could widen social disparities. Therefore, the government must ensure equitable distribution of digital infrastructure and improve public digital literacy so that the benefits of digital transformation can be felt equally. Furthermore, bureaucratic resistance to change is a crucial issue that requires attention. Digital transformation requires not only technological change but also organizational culture and the mindset of officials.

Without the commitment and readiness of human resources, the implementation of digital technology will not be optimal. Therefore, a strategy for developing the capacity of civil servants through training and continuous education is needed. Overall, the findings of this study indicate that digital transformation has significant potential to improve the quality of public services and support the achievement of smart governance. Its successful implementation depends heavily on the government's ability to overcome various challenges and build collaboration with all stakeholders. With the right approach, digital transformation can be a strategic solution for creating more innovative, inclusive, and sustainable public services.

5. Comparison

Compared to traditional service methods, digital-based services offer significant advantages, particularly in terms of speed, ease of access, and transparency. With a digital system, service processes can be carried out automatically and directly without the need for lengthy bureaucratic procedures. People are no longer required to come to the office, wait in line, or carry large amounts of physical documents. Instead, through digital platforms, services can be accessed anytime and anywhere, providing significantly greater convenience for users.

From an accessibility perspective, digital services can reach a wider audience, including those in remote areas, as long as there is an internet connection. This is a significant advantage because public services are no longer limited by geography. Furthermore, features within digital services, such as interactive guides and automatic notifications, help citizens understand procedures more easily. Thus, digitalization not only speeds up processes but also improves the quality of the user experience.

In terms of transparency, digital systems offer a higher level of openness than conventional methods. Information on procedures, costs, and estimated completion times can be directly accessed by the public through digital platforms. Digital footprints at every stage of service also enable stricter and more accountable oversight, reducing the risk of irregularities such as corruption, extortion, and discrimination. However, traditional services still play a crucial role, particularly in areas with limited technological infrastructure.

In areas without adequate internet access or with low digital literacy, face-to-face interaction remains the most effective solution. Conventional systems also offer the advantage of direct communication between officers and citizens, which is still necessary in some cases, especially for complex services or those requiring in-depth explanations. Furthermore, not all segments of society can easily adapt to digital technology, such as the elderly or those with limited education.

In this context, conventional services serve as an inclusive bridge to prevent social exclusion due to digitalization. Therefore, both digital and traditional systems should be viewed as complementary, not substitutes. Therefore, the most optimal approach is to adopt a hybrid service model, where the government combines digital services with conventional services. This model allows for modern and efficient service delivery while ensuring that all levels of society can access public services fairly and equitably.

6. Conclusions

The digitalization of public services is an inevitable strategic step in the effort to create smart governance in today's era. The use of digital technology has been proven to significantly transform the way governments provide services to citizens. With technology-based innovation, public services become faster, more efficient, more transparent, and more accessible. This transformation also shifts the paradigm from rigid bureaucracy to responsive services focused on public needs. Public service applications, electronic government systems, and the use of data and artificial intelligence are examples of digital innovations that improve service quality.

Transparency and accountability have also increased thanks to open information and digitally monitored systems. Furthermore, citizen participation has grown through digital platforms that enable citizens to participate in the policy-making process. However, the success of digital transformation depends not only on the availability of technology but also on adequate infrastructure. The disparity in access between urban and rural areas remains a major challenge that must be addressed. Without equitable digital infrastructure, the benefits of transformation will not be felt equally by all levels of society.

In addition to infrastructure, human resource readiness is a crucial factor. Government officials must possess sufficient digital competency to optimally manage and operate systems. The public also needs adequate digital literacy to effectively utilize services. Therefore, improving human resource capacity must be a priority in the transformation process. Policies and regulations also play a crucial role in supporting digitalization. The government must formulate policies that are adaptive, innovative, and able to adapt to rapid technological developments.

Regulations regarding data security and privacy protection also need to be strengthened to maintain public trust in digital services. Based on the research findings, several recommendations are available to support sustainable digital transformation. First, the government must strengthen public digital literacy through inclusive education and training programs. Second, investment in technology infrastructure, especially in remote areas, must be increased to reduce the digital divide. Third, bureaucratic reforms need to be continuously implemented to create a work culture that is flexible to technological change and innovation.

Thus, the digitalization of public services is not only a means of improving service quality but also a foundation for modern, inclusive, and sustainable governance. Its successful implementation depends heavily on the synergy between technology, people, and policies. Therefore, a strong commitment from all stakeholders is required for optimal digital transformation and broad benefits for society.

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