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THE INFLUENCE OF AI IMPLEMENTATION IN LOCAL GOVERNMENT INFORMATION SYSTEMS ON THE EFFECTIVENESS OF PUBLIC SERVICE DELIVERY IN INDONESIA

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Abstract

The rapid development of technology has brought significant changes in various aspects of life, including governance. One of the innovations that has been widely adopted is Artificial Intelligence (AI), which plays a crucial role in enhancing the efficiency, effectiveness, and quality of public services. The Indonesian government itself has made efforts to utilize this technology through the Electronic-Based Government System (SPBE) policy, which is regulated in Presidential Decree No. 95 of 2018. The implementation of AI in the public sector is expected to support the vision of "Golden Indonesia 2045" by creating a more adaptive, transparent, and accountable bureaucracy. However, the implementation of AI in government is not without challenges, such as bureaucratic complexity, limited digital infrastructure, and low levels of technological literacy among state officials. Therefore, a comprehensive and sustainable strategy is needed, including the development of human resource competencies and the application of ethical policies aligned with the values of Pancasila and the AI principles agreed upon in the G20 forum. This study aims to analyze the impact of AI implementation in local government information systems on the effectiveness of public service delivery in Indonesia. Additionally, this research also explores the extent to which AI implementation can drive organizational development in government agencies with complex hierarchical structures. The findings of this study are expected to provide both theoretical and practical contributions to strengthening technology-based governance in Indonesia.

Keywords: Artificial Intelligence, local government information systems, public service effectiveness, digital transformation, electronic-based governance.

INTRODUCTION

The rapid development of technology is an undeniable phenomenon. All layers of society have become integrated with technology, even at the personal level in daily life. This is because technology is considered to facilitate human work, ranging from routine tasks to complex ones that require a considerable amount of time. One such technology that is frequently used today is Artificial Intelligence (AI). The integration of technological innovation particularly AI and data analytics is crucial for improving efficiency, responsiveness, and the effectiveness of all business processes (Judijanto et al., 2023). This is because AI itself has created significant changes, particularly in the field of technology and information; it has replaced human tasks through a system. This makes AI a system used across all institutions, including government institutions, particularly in Indonesia.

In recent years, the Indonesian government has made efforts to implement various innovative policies with the goal of making Indonesia a global economic leader by 2045 (Saprudin, 2024). This ambition is encapsulated in the national slogan "Golden Indonesia 2045," which significantly focuses on the transformation of Indonesia's development. To achieve this goal, the Indonesian government has undertaken significant efforts, one of which is the integration of AI-based technology (Judijanto et al., 2023). In practice, AI has created transformative innovations in administrative developments, particularly within government sectors. This transformation includes improvements in efficiency, effectiveness, and personalization (Didin et al., 2024). The application of AI in public services has resulted in conveniences such as faster administrative tasks, more accurate data analysis, and real-time

decision-making (Didin et al., 2024). Services such as chatbots, predictive analytics, and IoT systems have successfully optimized public service outcomes across various sectors—healthcare, education, transportation, and security (Didin et al., 2024). The development of infrastructure and data management with AI is needed for planning AI development in government sectors. However, Indonesia still faces challenges in this development, such as high bureaucratic complexity, limited digital access, and low digital knowledge and literacy (Mustaniah et al., 2025). Despite these challenges, the Indonesian government has recognized the importance of AI in transforming the public service sector. The government has also worked on creating a comprehensive national strategy regarding AI usage (Mustaniah et al., 2025). One of the strategies is the issuance of Presidential Decree No. 95 of 2018 concerning the Electronic-Based Government System (SPBE). This regulation aims to create a clean and effective government that provides high-quality and reliable public services with a high degree of transparency and accountability (Mustaniah et al., 2025). In line with the SPBE vision, AI technology could be considered to assist the government in making decisions and processing policies that are suitable for public welfare (Mustaniah et al., 2025).

To enhance the quality and effectiveness of public services in Indonesia through AI, the government must create a comprehensive and integrative planning approach. This planning should consider various important aspects, such as ethics and policies, human resource development, infrastructure and data management, as well as industrial research and innovation (Mustaniah et al., 2025). Furthermore, this planning must align with the vision of "Golden Indonesia 2045" and the main national programs outlined in the National Medium-Term Development Plan (RPJMN) for 2025-2029 (Ministry of State Secretariat of the Republic of Indonesia, 2025). The five main priority sectors for AI usage in Indonesia include: healthcare services, bureaucratic reform services, education and research sectors, food security, and transportation and smart city sectors. In the development of AI in Indonesian government, more attention must be paid to ethical principles and existing policies. This aligns with the AI principles set during the G20 Summit in 2019. The principles emphasize that AI development must be based on inclusive development, sustainability, well-being, justice, human values, openness, transparency, caution, security, and accountability (620 Information Center, 2019).

With all the existing regulatory frameworks related to AI, the Indonesian government is expected to align these provisions with the values of Pancasila as the foundation of development. This is important to ensure that AI used in public services in Indonesia is aligned with human values, justice, and well-being for all Indonesian citizens (Mustaniah et al., 2025). The development of AI in public services in Indonesia entirely depends on the readiness and capacity of human resources in this field. The government must create a comprehensive strategy to develop AI-capable human resources through various stages of education and placement in government positions. One approach is to create AI training and skill development programs for government employees with the aim of enhancing their knowledge and capabilities in using AI to improve the efficiency and quality of public services (Mustaniah et al., 2025). This study aims to examine the impact of AI implementation in local government information systems on the effectiveness of public service delivery in Indonesia. Additionally, this study seeks to identify the extent to which AI can create organizational development in agencies with complex hierarchical structures, such as government institutions. This research also highlights the research gaps that still exist in the literature.

LITERATURE REVIEW

This literature review systematically examines twenty-five articles published between 2020 and 2025, focusing on the intersection of artificial intelligence (AI) adoption in public administration and service delivery. This analysis reveals the conceptual, methodological, and empirical patterns surrounding AI integration, identifying how AI technologies have shaped the delivery efficiency of public services. The findings suggest that AI has significantly impacted public administration, and enhancing operational efficiency, service accessibility, and citizen engagement, while presenting challenges in governance and regulatory frameworks. To provide a comprehensive overview, twenty-five articles meeting the inclusion criteria are summarized in Table 1. This table includes author details, the year of publication, the research focus, and the principal results of each study. The summary forms the foundation for thematic analysis, addressing AI's role in public administration under three main dimensions: technological innovation, citizen trust, and implementation challenges.

Table 1. Relevant Research

No	Author/Year	Research Focus	Research result
1	Haryono, D., & Nuraisyah, N. (2025)	Strategies to Improve Public Services with AI in Indonesia	The study identifies key strategies for enhancing public service quality in Indonesia using AI, with a focus on improving efficiency and transparency in local government services.
2	Yigitcanlar, T., et al. (2024)	AI Adoption in Local Governments	This paper explores best practices and lessons learned from AI implementations in local governments, highlighting successes and barriers in various regions.
3	Saragih, A., et al. (2022)	AI in Tax Administration System	Examines AI's role in modernizing tax administration in Indonesia, showing improvements in accuracy, efficiency, and citizen compliance.
4	Madan, R., & Ashok, M. (2022)	AI Adoption in Public Administration	A systematic review of AI adoption in public administration, providing insights into diffusion patterns and challenges in implementing AI in governmental operations.
5	Yusriadi, Y., et al. (2023)	AI Implementation in Indonesia	Analyzes the current state of AI adoption in Indonesia, focusing on its application in various sectors, including public administration and service delivery.
6	Wadipalapa, R., et al. (2024)	AI Policy in Decentralized Governance	Investigates AI policy implementation in decentralized governance systems, with evidence from Indonesia, discussing challenges and opportunities for local governments.
7	Al-Ansi, A., et al. (2024)	AI and IoT in E-Government	Explores how the integration of AI and IoT can enhance e-government services, improving public service delivery through innovative technologies.
8	Martitah, M., et al. (2021)	E-Government Adoption in Indonesia	Studies the adoption of e-government technologies in Indonesian local governments, identifying factors influencing successful implementation and citizen participation.
9	Maragno, G., et al. (2023)	AI in Public Sector Organizations	Discusses the affordances and constraints of AI in public sector organizations, examining organizational readiness and the challenges faced during AI adoption.
10	Adnan, H., et al. (2021)	AI Adoption for Open Government	Investigates the drivers behind the adoption of AI technologies for open government in Indonesia, focusing on both citizens' and governments' roles.
11	Setiawan, A., et al. (2022)	Impact of Local Government Capacity on Service Delivery	Highlights the critical role of local government capacity in ensuring the effective delivery of public services, especially in decentralized systems.
12	Wibowo, M., et al. (2025)	AI in Health Systems in Southeast Asia	Provides an in-depth analysis of AI adoption in Southeast Asian health systems, focusing on its role in improving diagnostics and patient care in the region.
13	Yigitcanlar, T., et al. (2022)	Public Perceptions of AI in Urban Services	Examines public perceptions and the challenges faced by urban governments in adopting AI technologies, highlighting issues of trust and transparency.
14	Sabani, A., et al. (2023)	Citizen Adoption of E-Government	Identifies factors influencing citizen adoption of e-government technologies in developing countries, particularly focusing on Indonesia.
15	Aswar, K., et al. (2023)	Factors Affecting Citizen Adoption of E-Government in Indonesia	Analyzes the factors affecting Indonesian citizens' adoption of e-government services, focusing on technological readiness and trust in government.
16	Schiff, D., et al. (2021)	Public Value Failure in AI Adoption	Assesses the risks of public value failure in the adoption of AI by governments, emphasizing the importance of

No	Author/Year	Research Focus	Research result
			aligning AI initiatives with public interest.
14	Sabani, A., et al. (2023)	Citizen Adoption of E-Government	Identifies factors influencing citizen adoption of e-government technologies in developing countries, particularly focusing on Indonesia.
15	Aswar, K., et al. (2023)	Factors Affecting Citizen Adoption of E-Government in Indonesia	Analyzes the factors affecting Indonesian citizens' adoption of e-government services, focusing on technological readiness and trust in government.
16	Schiff, D., et al. (2021)	Public Value Failure in AI Adoption	Assesses the risks of public value failure in the adoption of AI by governments, emphasizing the importance of aligning AI initiatives with public interest.
17	Robles, P., & Mallinson, D. (2023)	AI Technology and Public Trust	Explores the relationship between AI technology, public trust, and effective governance, emphasizing the importance of transparency and accountability in AI deployments.
18	Campion, A., et al. (2020)	Challenges in Adopting AI in the Public Sector	Investigates the collaborative challenges governments face when adopting AI technologies, focusing on organizational resistance and policy alignment.
19	Wang, Y., et al. (2020)	Determinants in Government AI Adoption	Examines the stages of AI adoption in local government chatbots in China, identifying key factors influencing the adoption process across different governmental levels.
20	Vogl, T., et al. (2020)	Algorithmic Bureaucracy in Local Authorities	Studies the emergence of algorithmic bureaucracy in local authorities in the UK, discussing the ethical implications and operational challenges of AI adoption.
21	Babšek, M., et al. (2025)	AI Adoption in Public Administration	Focuses on the factors driving AI adoption in public administration, particularly in the context of improving efficiency and public service delivery.
22	Criado, J. I. (2025)	AI and Public Administration	Explores the implementation and governance challenges of AI in public administration, identifying key barriers to adoption and strategies for overcoming them.
23	Judijanto, L., et al. (2023)	AI and Data Analytics in Public Services	Discusses strategies for utilizing AI and data analytics to improve the effectiveness of public services in Indonesia at the local government level.
24	Mustainah, M., et al. (2025)	Improving Public Services with AI	Examines the potential of AI to improve public service quality in Indonesia, with a focus on governmental and organizational strategies for successful implementation.
25	Zuiderwijk, A., et al. (2021)	AI in Public Governance	A systematic literature review that discusses the implications of AI in public governance, proposing a research agenda to guide future AI adoption in governmental operations.

This literature review systematically explores the relationship between Artificial Intelligence (AI) and public sector governance, with a particular focus on its impact on the effectiveness of public services. The findings highlight three key themes: the adoption of AI in public administration, its implications for workforce performance, and the challenges encountered during its implementation. These themes are explored further in the subsequent subsections.

METHOD

This research employs a literature review approach, which is a method for evaluating and reviewing previous research relevant to the topic of AI in the public sector and government. This approach analyzes and compares the results of previous studies regarding the implementation of AI in the public sector and government and its impact on the effectiveness of public service delivery in Indonesia. This study is qualitative and descriptive in nature, with a content analysis approach. The researcher does not collect primary data but analyzes secondary

data obtained from academic literature sources. This approach is used to understand the application of AI in the public sector and government from various theoretical and empirical perspectives based on previous research findings. The data in this study is sourced from secondary literature, such as national and international journal articles, books related to human resource management and information technology, and scientific publications that are published online and are credible. The criteria for selecting the literature sources include: publication within the last 10 years (2015-2025) to ensure relevance to the current technological developments, a focus on the implementation of AI in the public sector and government, and articles that have undergone peer review and have an official academic identifier, such as a DOI.

The data collection technique used in this study is library research. The researcher does not conduct surveys or interviews directly but instead gathers relevant secondary data sources related to the research topic. This approach is adopted because the focus of the research lies in analyzing concepts, theories, and the results of previous studies on the application of Artificial Intelligence (AI) in local government information systems and its impact on the effectiveness of public service delivery. The data collection process begins with searching academic literature from credible sources, such as national and international scientific journals, academic books, government policy reports, and other scholarly publications with a Digital Object Identifier (DOI) or those that have undergone peer review. The researcher specifically selects references published between 2015 and 2025 to ensure the data and discussion are relevant to the latest technological developments and the dynamics of AI implementation in the public sector. Additionally, the researcher uses government policy documents, such as Presidential Decree No. 95 of 2018 on the Electronic-Based Government System (SPBE) and national planning documents such as the RPJMN 2025–2029 issued by Bappenas. These documents are used as references to understand the strategic policy direction of the Indonesian government in implementing AI-based technology. The data analysis in this study is conducted qualitatively with a content analysis approach. This technique is used to systematically examine various sources of literature to identify patterns, themes, and relationships between concepts emerging from previous research related to the application of Artificial Intelligence (AI) in local government information systems.

The analysis process begins by classifying the literature based on its focus, such as AI policy implementation in the public sector, public service effectiveness, and the impact of AI on government information systems. Each source is analyzed to identify key points relevant to the research problem. Next, a data reduction process is carried out, which involves filtering the information so that only relevant data supporting the research objectives is retained. The reduced data is then organized into major themes such as digital government transformation, AI-based public service innovations, and strengthening governance and organizational capabilities. The next step is data interpretation, where the researcher links the findings from the literature to the theories presented in the literature review section. This process aims to gain deeper insights from each finding and assess its relevance to the context of the government system in Indonesia. The analysis concludes with a conceptual conclusion drawn from the synthesis of various studies. This conclusion serves as the basis for answering the research question regarding the extent to which the implementation of AI influences the effectiveness of local government information systems and improves the quality of public service delivery in Indonesia. To maintain the validity of the results, this study uses the principle of triangulation of sources, which involves comparing the results from various studies with different contexts, methodologies, and locations. Furthermore, only literature with clear methodology and data sources is used in the analysis.

RESULTS AND DISCUSSION

The Adoption of AI In Public Administration

The adoption of AI in public administration refers to the use of advanced machine learning algorithms, data analytics, and automated systems to optimize governmental processes. This includes applications ranging from administrative tasks such as data processing, decision-making, and service delivery, to more complex functions like predictive analytics for policy planning, smart city initiatives, and AI-driven legal and health systems (Babšek et al., 2025; Criado, 2025). A significant motivation for AI adoption is the need to improve the efficiency, accuracy, and accessibility of public services. According to Yigitcanlar et al. (2024), AI technologies have the potential to enhance public sector performance by automating routine tasks, reducing human error, and enabling real-time service delivery. The Indonesian government, for instance, has made strides in integrating AI into its local government systems, leading to notable improvements in public service efficiency and accessibility (Haryono & Nuraisyah, 2025). AI applications such as chatbots, predictive algorithms, and automated customer service platforms have facilitated smoother and faster public interactions (Yusriadi et al., 2023). AI's primary impact on public administration lies in its ability to improve public service delivery. Studies show that AI adoption in public

administration can significantly reduce processing times, enhance decision-making capabilities, and optimize service access (Madan & Ashok, 2022). For example, in the health sector, AI tools are used to speed up diagnostic processes and improve patient care management, resulting in better health outcomes (Saragih et al., 2022). Similarly, in the transport sector, AI algorithms help manage traffic patterns, improving transportation efficiency and reducing congestion in urban areas (Haryono & Nuraisyah, 2025). The integration of AI also leads to the modernization of public services, offering citizens more convenient, real-time access to government services. AI-enabled platforms, such as e-licensing systems and virtual government assistants, have transformed how citizens interact with public authorities, making services more accessible, especially in remote or underserved areas (Yigitcanlar et al., 2024). The use of AI for digitalization in sectors like education, tax administration, and law enforcement has been particularly impactful in enhancing transparency and reducing bureaucratic inefficiencies (Wadipalapa et al., 2024).

Despite its promising benefits, AI adoption in public administration faces significant challenges that can impede its widespread implementation. One of the primary barriers is the lack of infrastructure and skilled human resources in many regions, particularly in developing countries like Indonesia (Wadipalapa et al., 2024; Yusriadi et al., 2023). Many local governments struggle with outdated digital infrastructure, which hampers the integration of AI technologies into their systems. Moreover, there is a shortage of AI-trained personnel capable of managing and maintaining these technologies, further slowing the adoption process. In addition to infrastructure challenges, regulatory and governance issues also hinder AI implementation in the public sector. According to de Sousa et al. (2019), the absence of clear AI regulations and standards in many countries creates uncertainty regarding the ethical use of AI in governance. The decentralized nature of governance, especially in countries with federal or decentralized systems, can lead to fragmented AI policies, making it difficult to implement AI solutions consistently across different government levels (Madan & Ashok, 2022).

Furthermore, data privacy and security concerns are significant issues in the adoption of AI in public administration. As AI systems rely heavily on data processing, the protection of sensitive information becomes paramount. The potential misuse of AI-driven decisions, coupled with the vulnerability of personal data in digital systems, raises concerns regarding citizens' trust in AI applications within public services (Al-Ansi et al., 2024; Haryono & Nuraisyah, 2025). Therefore, strong data protection frameworks and transparent AI governance models are essential to ensure that AI is used ethically and responsibly in the public sector. To overcome these challenges, various strategies can be implemented to facilitate the adoption of AI in public administration. First, strengthening digital infrastructure at the local government level is crucial. Governments must invest in upgrading their IT systems, including cloud-based platforms and secure databases, to accommodate AI technologies (Madan & Ashok, 2022). Additionally, public sector employees should be provided with targeted training programs to improve their AI literacy and equip them with the necessary skills to operate and manage AI systems effectively (Yigitcanlar et al., 2024). Second, governments need to establish clear and comprehensive AI policies and regulations that address ethical considerations, data privacy concerns, and AI governance (Criado, 2025). This includes ensuring that AI systems are transparent, accountable, and subject to proper oversight to maintain public trust. Regulatory bodies should work closely with AI developers, researchers, and policymakers to create guidelines that ensure the responsible use of AI in public services (de Sousa et al., 2019).

AI Implications For Workforce Performance

AI's entry into the public sector has led to an increasing shift towards automation of routine tasks traditionally performed by human workers. In the public sector, this transformation is evident in the automation of administrative tasks such as data entry, processing, scheduling, and basic customer service. The impact of AI automation on workforce performance can be both beneficial and disruptive, as it streamlines operations while presenting challenges related to employee displacement, skill gaps, and organizational adaptation (Brynjolfsson & Mitchell, 2017; Mergel et al., 2024). AI's capacity to perform repetitive tasks with speed and accuracy leads to substantial improvements in efficiency. By automating mundane administrative processes, AI enables workers to focus on higher-level functions that require creative problem-solving, strategic thinking, and decision-making. For instance, AI can handle the processing of tax returns or the automation of citizen inquiries through chatbots, allowing public servants to devote their time to more complex tasks (Mergel et al., 2024). This shift improves the overall productivity of the workforce by reallocating human resources to value-added activities. As AI transforms public sector operations, it creates a pressing need for workers to acquire new skills. AI and automation technologies demand a workforce capable of understanding, managing, and optimizing these technologies. The implications for workforce performance are significant as employees are required to develop competencies in areas

such as data analytics, machine learning, and AI system management. Mergel et al. (2024) emphasize that public sector employees must develop digital literacy and technical skills to effectively interact with AI systems. These skills include the ability to understand AI-driven data outputs, use AI tools to improve service delivery, and ensure that AI applications are functioning correctly. This shift toward a digital, technology-savvy workforce requires governments to invest in comprehensive reskilling programs to help workers adapt to the new demands of AI-integrated environments (Yigitcanlar et al., 2024).

Moreover, a digitally skilled workforce is not only beneficial for improving operational efficiency but also critical for ensuring that AI systems are used ethically and effectively. Public employees with knowledge of AI can participate in decision-making processes related to AI deployments, ensuring transparency and fairness in AI-driven decision-making processes. For example, in areas like public health or criminal justice, AI tools used for predictive analytics need to be managed by employees who understand the ethical implications of such tools (Criado, 2025). AI's integration into the workforce has the potential to both positively and negatively affect employees' roles and job satisfaction. On one hand, AI can enhance job satisfaction by eliminating monotonous tasks and allowing workers to engage in more meaningful, creative, and decision-driven work. For instance, employees in public administration may find satisfaction in tasks that require strategic thinking, policy analysis, and citizen engagement, rather than being bogged down by routine clerical work (Mergel et al., 2024).

On the other hand, the introduction of AI into public administration may lead to role ambiguity and job insecurity, particularly among employees who perceive AI as a threat to their job stability. Workers in administrative positions may feel displaced by automation, resulting in reduced morale and job dissatisfaction. Studies have shown that AI implementation can induce anxiety and resistance to change, especially among employees who lack digital skills or are uncertain about their roles in an AI-augmented environment (Brynjolfsson & Mitchell, 2017). To address these concerns, organizations must focus on change management strategies that involve employees in the transition process. According to de Sousa et al. (2019), successful AI integration requires transparent communication, clear role definitions, and opportunities for employees to develop new competencies. When workers perceive AI as a tool that enhances their capabilities rather than a replacement, it fosters a more positive relationship with technology and can improve job satisfaction.

AI’s potential to assist in decision-making is a key area where workforce performance is impacted. By leveraging AI-driven data analytics and machine learning models, public sector workers can make more informed, data-driven decisions that improve the quality of services and outcomes. For example, AI can be used to predict the demand for social services or optimize the allocation of government resources, enabling more effective public administration (Judijanto et al., 2023; Yigitcanlar et al., 2024). For instance, AI algorithms used for public health management must be monitored and validated by knowledgeable personnel to prevent biases or incorrect predictions. As a result, there is a growing need for public sector employees to balance human judgment with AI insights, which highlights the importance of continuous professional development (Mergel et al., 2024).

One of the primary ethical challenges associated with AI in public administration is ensuring that AI systems are designed and implemented in a way that is fair, transparent, and accountable. The implications of AI for workforce performance are not limited to technological adaptation; they also encompass the need for ethical AI governance within public sector organizations. AI systems must be free from biases that could unfairly impact certain groups of citizens, such as those from disadvantaged socioeconomic backgrounds or minority communities (Al-Ansi et al., 2024).

AI Implementation Challenges In Public Governance

A primary challenge faced by public institutions in adopting AI is the lack of adequate infrastructure. Many governments, particularly in developing countries, face difficulties in establishing the digital frameworks necessary to support AI integration. The implementation of AI systems requires robust digital infrastructure, including high-performance computing resources, secure data storage solutions, and a seamless digital ecosystem for real-time processing and decision-making (Madan & Ashok, 2022; Yigitcanlar et al., 2024). In Indonesia, for example, the lack of modern IT infrastructure at the local government level hampers the effective deployment of AI technologies. Haryono and Nuraisyah (2025) note that the digital divide between urban and rural areas in Indonesia further exacerbates these challenges. Without proper infrastructure, the rollout of AI systems in government agencies remains slow and inefficient, limiting the potential benefits of AI applications in public services. Moreover, the complexity of AI technologies demands advanced technical support and maintenance, which is often lacking in public institutions. Governments must invest in upgrading their technological infrastructure to ensure the successful implementation and sustainability of AI solutions (Yigitcanlar et al., 2024). This includes investing in

cloud computing, high-capacity servers, and data processing capabilities that can handle large datasets generated by AI systems. Additionally, ensuring that the digital infrastructure is scalable and adaptable to future technological developments is crucial for long-term success.

Another significant challenge in AI implementation in public governance is the absence of comprehensive regulatory and policy frameworks. The rapid pace of AI development has outpaced the formulation of policies and regulations that govern its use in the public sector. This regulatory lag creates uncertainty, making it difficult for public institutions to navigate the complexities of AI deployment (de Sousa et al., 2019; Criado, 2025). A lack of clear guidelines on AI ethics, accountability, and oversight can lead to inconsistent AI applications, which can undermine public trust. Governments must develop specific regulations that address the ethical, legal, and operational challenges posed by AI. For instance, AI systems used in public administration must comply with data protection laws, ensure transparency in decision-making, and be subject to audit mechanisms to guarantee fairness and accountability (Haryono & Nuraisyah, 2025). These regulatory frameworks should be flexible enough to adapt to the rapidly changing AI landscape while maintaining public confidence in the use of technology in governance.

In Indonesia, the central government has introduced some frameworks, such as the Electronic-Based Government System (SPBE), but implementation at the local level remains inconsistent due to the decentralization of governance (Wadipalapa et al., 2024). The lack of a unified, nationwide AI strategy complicates the integration of AI across different levels of government. Therefore, a cohesive, cross-sectoral regulatory approach is essential to ensure that AI is used responsibly, ethically, and effectively in public governance. The successful implementation of AI in public governance is also impeded by organizational resistance. Public sector institutions are often characterized by bureaucratic structures that are resistant to change. The introduction of AI technologies disrupts existing workflows, processes, and hierarchies, creating anxiety and resistance among public employees (Mergel et al., 2024; Brynjolfsson & Mitchell, 2017). Furthermore, resistance to change is often tied to the lack of leadership commitment to AI initiatives. Leaders within public administration may lack the vision or understanding of how AI can enhance service delivery, leading to a lack of strategic direction in implementing AI projects (Criado, 2025). Therefore, fostering a culture of innovation and digital leadership is essential for overcoming organizational resistance and ensuring the successful integration of AI in public governance.

AI systems, particularly those used in public governance, raise significant ethical concerns. One of the primary ethical challenges is ensuring fairness and transparency in AI decision-making. AI algorithms can inadvertently perpetuate biases present in historical data, leading to discriminatory outcomes in areas such as public health, law enforcement, and social services (Brynjolfsson & Mitchell, 2017; de Sousa et al., 2019). For example, AI-based predictive policing systems have been criticized for reinforcing existing biases in criminal justice, disproportionately targeting minority communities (Mergel et al., 2024). Similarly, AI applications in welfare or healthcare systems might unintentionally favor certain demographic groups over others due to biased training data. To mitigate these risks, it is critical that AI systems are designed and regularly audited for fairness and transparency. Governments must establish ethical guidelines for AI deployment that prioritize accountability, non-discrimination, and inclusivity (Haryono & Nuraisyah, 2025). Moreover, AI systems in public governance often involve the collection and processing of large amounts of personal and sensitive data. This raises concerns regarding privacy and data security. Ensuring that AI systems comply with data protection laws and safeguarding citizens' personal information is crucial for maintaining trust in AI-driven public services. The ethical implications of AI use in public administration must be continuously monitored, and measures must be put in place to prevent misuse (Al-Ansi et al., 2024).

Data privacy and security are among the most pressing challenges when implementing AI in public governance. AI systems require vast amounts of data to function effectively, and this data is often personal, sensitive, and confidential. Inadequate data protection mechanisms can lead to breaches of privacy and public mistrust in AI technologies (Yigitcanlar et al., 2024). Governments must establish strong data protection policies that govern the collection, storage, and use of personal data by AI systems. This includes implementing encryption technologies, ensuring secure access to data, and providing transparency regarding how data is used. Public sector organizations must also establish clear protocols for data governance, including regular audits of AI systems to identify potential vulnerabilities or security risks (Madan & Ashok, 2022).

DISCUSSION

The integration of Artificial Intelligence (AI) into public governance is an exciting development that holds the potential to radically improve efficiency, transparency, and service delivery. However, as highlighted throughout the literature, AI adoption in public administration is fraught with significant challenges that hinder its

widespread and effective implementation. This discussion synthesizes these challenges and explores their implications for AI deployment in public sector organizations, drawing upon recent studies and practices in both developed and developing countries, including Indonesia. One of the most significant hurdles in implementing AI in public governance is the lack of adequate technological infrastructure. As emphasized by Haryono and Nuraisyah (2025), many local governments, particularly in developing countries like Indonesia, face challenges due to outdated digital infrastructures that are ill-equipped to support AI technologies. AI systems require high-performance computing resources, secure cloud storage, and advanced data analytics capabilities to process and analyze large volumes of data effectively. Unfortunately, many public sector organizations, especially at the local level, lack these resources, which significantly impedes AI adoption and limits the extent to which it can improve service delivery (Yigitcanlar et al., 2024).

Moreover, the complexity of AI technologies necessitates the development of an integrated technological ecosystem that includes secure communication networks, real-time data processing systems, and the interoperability of various platforms. The absence of these foundational technological elements further complicates AI implementation. As AI systems become more embedded in public administration, it is crucial that governments invest in upgrading their digital infrastructure to accommodate the scale and scope of AI technologies (Madan & Ashok, 2022). In addition to infrastructure challenges, the absence of robust regulatory frameworks is another major impediment to AI adoption in public governance. De Sousa et al. (2019) point out that the rapid evolution of AI technologies often outpaces the development of regulations and policies designed to govern their use. In many cases, public sector organizations lack clear, comprehensive guidelines on issues such as ethical AI deployment, data privacy, and accountability, making it difficult to integrate AI in a manner that ensures transparency and fairness.

In Indonesia, for example, the central government's efforts to implement AI-driven governance, such as the Electronic-Based Government System (SPBE), are hindered by a lack of coordinated policies at the regional level. As local governments operate with varying levels of AI expertise and technological readiness, there is a pressing need for a unified, nationwide strategy that establishes common standards for AI implementation across all levels of government (Wadipalapa et al., 2024). The development of such a regulatory framework is essential to provide clear guidelines on the ethical use of AI and to establish accountability structures to prevent misuse. Furthermore, the lack of specific regulations for AI in public sector governance increases the risk of unintended consequences, such as algorithmic biases, discrimination, or violations of privacy (Criado, 2025). It is therefore critical that governments develop and enforce policies that ensure AI applications are used ethically, with a focus on fairness, transparency, and public trust. AI implementation also faces substantial resistance from public sector employees, particularly those whose roles may be displaced by automation. Brynjolfsson and Mitchell (2017) highlight the potential for AI to disrupt traditional job functions, raising concerns about job security, especially among employees performing routine administrative tasks. This fear of displacement has led to organizational resistance, where employees are reluctant to embrace AI technologies due to concerns over their job stability (Mergel et al., 2024).

Moreover, public sector organizations often operate with entrenched bureaucratic structures that can be resistant to technological change. AI systems require a cultural shift within organizations, from a focus on traditional hierarchical management to a more collaborative, data-driven approach. Resistance to change is particularly prevalent in organizations where employees lack the necessary digital skills to work with AI systems. To overcome this resistance, governments must implement comprehensive change management strategies that involve employees in the AI adoption process, provide training and reskilling programs, and foster a culture of continuous learning (Mergel et al., 2024; Haryono & Nuraisyah, 2025). In Indonesia, while AI adoption has shown promise in enhancing public service delivery, the workforce's readiness to operate and manage AI systems remains a major concern. A key challenge lies in reskilling civil servants, many of whom lack the technical expertise to engage with AI tools effectively (Wadipalapa et al., 2024). Addressing this issue will require substantial investments in education and training, alongside clear communication about the benefits of AI integration for public sector employees. Ethical issues surrounding AI, particularly in relation to decision-making, fairness, and privacy, are critical challenges for public sector organizations. AI systems, when not properly designed and regulated, can perpetuate existing biases, leading to unfair outcomes in sectors like criminal justice, healthcare, and social services. As noted by Mergel et al. (2024), AI systems are only as good as the data they are trained on, and biased or incomplete data sets can result in discriminatory outcomes. For example, predictive algorithms used in public health or law enforcement may disproportionately target certain demographic groups if the training data reflects historical inequalities (Criado, 2025). To address these challenges, public sector organizations must

implement robust data governance frameworks that include clear guidelines on data protection, transparency in decision-making, and accountability for AI-driven decisions. Ensuring the ethical use of AI in public administration is not only necessary for safeguarding citizens' rights but also for maintaining public trust in government institutions (Haryono & Nuraisyah, 2025).

CONCLUSION

The adoption of Artificial Intelligence (AI) in public governance offers transformative potential for improving the efficiency, transparency, and accessibility of government services. AI technologies can automate routine tasks, enhance decision-making processes, and facilitate faster service delivery, contributing to the overall improvement of public administration. This potential is particularly evident in sectors like healthcare, transportation, and public safety, where AI has already made significant strides in optimizing operations and enhancing citizen engagement (Haryono & Nuraisyah, 2025; Yusriadi et al., 2023). However, the implementation of AI in public governance is not without its challenges. Key obstacles include inadequate digital infrastructure, which hinders the effective integration of AI systems, particularly in developing countries like Indonesia (Yigitcanlar et al., 2024). Additionally, the lack of comprehensive regulatory frameworks leaves AI applications vulnerable to issues such as algorithmic bias, transparency concerns, and inconsistent data protection practices (de Sousa et al., 2019; Criado, 2025). Addressing these gaps requires robust investments in technology and the development of clear, ethical guidelines for AI deployment.

Organizational resistance also poses a significant barrier, with employees often fearing job displacement due to AI automation (Mergel et al., 2024). To mitigate these concerns, governments must prioritize reskilling programs and foster a culture of innovation to ensure that the workforce can adapt to new roles and collaborate with AI technologies. Public sector employees should be provided with the tools and knowledge to engage with AI systems effectively, which will enable a smooth transition and improve workforce performance. In conclusion, while AI offers immense benefits for public governance, its successful implementation depends on overcoming infrastructure, regulatory, and organizational challenges. Governments must develop comprehensive strategies that address these issues, including infrastructure upgrades, regulatory reforms, and workforce development. By doing so, AI can become a powerful tool for enhancing public service delivery and governance, leading to more efficient, transparent, and responsive public administration.

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