

Opportunities and Challenges of AI in Public Services: A Literature Review from Ethical, Policy, and Implementation Perspectives

Rahmat Nurjaman¹, Marini²

^{1,2}Fakultas Ilmu Sosial Dan Ilmu Politik Universitas Cenderawasih, Jayapura – Papua, Indonesia

ABSTRACT: Artificial Intelligence (AI) has become a transformative force in the public sector, offering great potential to improve service delivery, operational efficiency, and transparency in government operations. This literature review aims to analyze the opportunities and challenges associated with the adoption of AI in public services, with a focus on ethical, policy, and implementation perspectives. This review identifies key benefits such as increased efficiency, reduced costs, and better responsiveness to citizens' needs. However, it also highlights significant challenges, particularly ethical issues related to algorithmic bias, transparency, and data privacy, which can undermine public trust in AI systems. Furthermore, this review emphasizes the lack of integrated policy frameworks, which hinders the consistent adoption and integration of AI in public institutions. Operational barriers such as technical expertise limitations, budget constraints, and resistance to change within bureaucratic structures further hinder AI implementation. Nevertheless, these findings indicate that AI has great potential to improve public services, particularly in sectors such as healthcare, education, and law enforcement. To fully capitalize on this opportunity, governments must adopt a holistic approach that integrates ethical governance, clear policies, and effective implementation strategies. This review concludes by providing practical insights for policymakers, practitioners, and researchers in navigating the complexities of AI in public services, ensuring that its implementation aligns with societal values and public interests.

KEYWORDS: Artificial Intelligence in public services, AI implementation, AI challenges in public services.

I. INTRODUCTION

Artificial Intelligence (AI) has become a transformative force in various sectors, particularly in the public sector, where its potential to improve services, increase efficiency, and promote transparency is increasingly recognized [1]. As more governments around the world integrate AI into public services, the need to understand the opportunities and challenges it offers is becoming increasingly urgent [2]. This literature review, titled Opportunities and Challenges of AI in Public Services: A Literature Analysis from Ethical, Policy, and Implementation Perspectives, aims to examine these dynamics, with a focus on the ethical, policy, and implementation challenges that accompany the adoption of AI technology in public services. By critically analyzing the existing body of research, this paper aims to provide insights into how AI can be effectively integrated into the public sector while navigating inherent risks.

The potential benefits of AI in public services are enormous [3]. From predictive analytics that can improve public health outcomes to machine learning models that increase government operational efficiency, AI promises to redefine how public services are designed and delivered [4]. AI technologies, such as chatbots, predictive maintenance systems, and data-driven decision-making tools, can streamline government processes, reduce costs, and improve responsiveness to citizens' needs [5]. The growing application of AI in fields such as healthcare, education, and law enforcement highlights its potential to revolutionize the public sector [6]. However, despite these advances, challenges related to data privacy, transparency, and accountability remain, complicating the widespread implementation of AI [7].

One of the biggest concerns surrounding AI in the public sector is the ethical implications of its implementation [8]. Ethical issues such as algorithmic bias, lack of transparency, and potential discrimination remain important in the discourse on AI adoption. As AI systems become more complex and opaque, ensuring fairness and accountability in decision-making becomes increasingly difficult. Public institutions must address these ethical challenges to ensure that AI technology does not exacerbate

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existing social inequalities or undermine public trust [9]. Furthermore, the ethical implications of AI are compounded by the responsibility of governments to protect the rights and freedoms of their citizens.

In addition to ethical challenges, the adoption of AI in the public sector is often hampered by policy barriers. Governments must create and implement regulations that not only encourage innovation but also protect citizens from potential harm. The lack of clear and cohesive policies on AI governance has led to inconsistent adoption across regions and sectors. As AI technology rapidly evolves, policymakers must address issues such as data ownership, algorithm transparency, and AI system governance in a proactive and adaptive manner. Additionally, the regulatory landscape must evolve to address new ethical and legal issues that arise as AI systems are integrated into critical public services.

The implementation of AI in the public sector also faces significant operational challenges. Many public organizations struggle to integrate AI technology into their existing infrastructure due to limitations in data quality, technical expertise, and financial resources. In addition, resistance to change in bureaucratic systems can slow down the adoption of innovative technologies. Successful AI implementation requires not only technological solutions, but also organizational change management strategies that can facilitate the adoption of AI tools at various levels of government. This literature review will explore these challenges and provide recommendations to address them, particularly in the context of public sector organizations.

Despite these challenges, the opportunities for AI to improve public sector performance are enormous. By adopting AI, public agencies can unlock new efficiencies, improve decision-making processes, and better serve the needs of citizens. However, these opportunities must be balanced with the need for ethical governance, clear policy frameworks, and effective implementation strategies. This literature review synthesizes existing research on AI in public services to provide a comprehensive understanding of both the potential and pitfalls. The aim is to guide future research and provide actionable insights for policymakers, practitioners, and academics in this field.

The integration of AI in public services presents enormous opportunities, but also enormous challenges. As AI continues to evolve, it is crucial for governments to adopt a holistic approach to the adoption of this technology, taking into account not only the capabilities of AI technology but also its ethical, policy, and operational implications. This literature review will provide a comprehensive analysis of these aspects, offering guidance on navigating the complexities of AI in the public sector and ensuring that its implementation aligns with social values and public interests.

II. MATERIALS AND METHODS

Search Strategy

This study uses a Systematic Literature Review (SLR) approach to identify [10], select, and evaluate relevant literature on the application of Artificial Intelligence (AI) in public services, with a focus on ethical, policy, and implementation aspects [11]. The search was conducted in the reputable international scientific database Scopus. The keywords used in the search included combinations of terms such as “Artificial Intelligence in public services,” “AI implementation,” and “AI challenges in public services.” Search filters were applied to articles published between 2021 and 2025 and written in English to ensure the relevance and quality of the information found.

Study Selection

Article selection was conducted in two stages. The first stage involved screening based on article titles and abstracts. Articles that appear relevant to the research topic are then forwarded to the second stage, which involves reading the full text to ensure that they meet the predetermined inclusion and exclusion criteria [12]. The inclusion criteria include articles that discuss the application of AI in the public sector, whether in the context of technical implementation, policy, or ethics, published in peer-reviewed journals or leading international conferences. In addition, articles relevant to the topics of ethics, policy, or challenges in AI implementation in the public sector were also included. Exclusion criteria included articles discussing studies not published in reputable international journals, as well as articles that only reviewed technical aspects of AI without considering policy or ethics.

Procedure

This research procedure follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which consist of several important stages. The first stage is searching for articles in the databases mentioned above, resulting in 157 articles that match the keywords used. The second stage is screening articles based on year, title, and abstract to ensure topic relevance, leaving approximately 141 articles. In the third stage, articles were screened based on document type, language, and open access availability, leaving 29 articles. After meeting the criteria, only 15 articles remained. Most articles were not used because they did not discuss Artificial Intelligence (AI) in public services, focusing instead on ethical, policy, and implementation aspects. All articles were extracted from their sources and analyzed using Mendeley to eliminate duplicate articles.

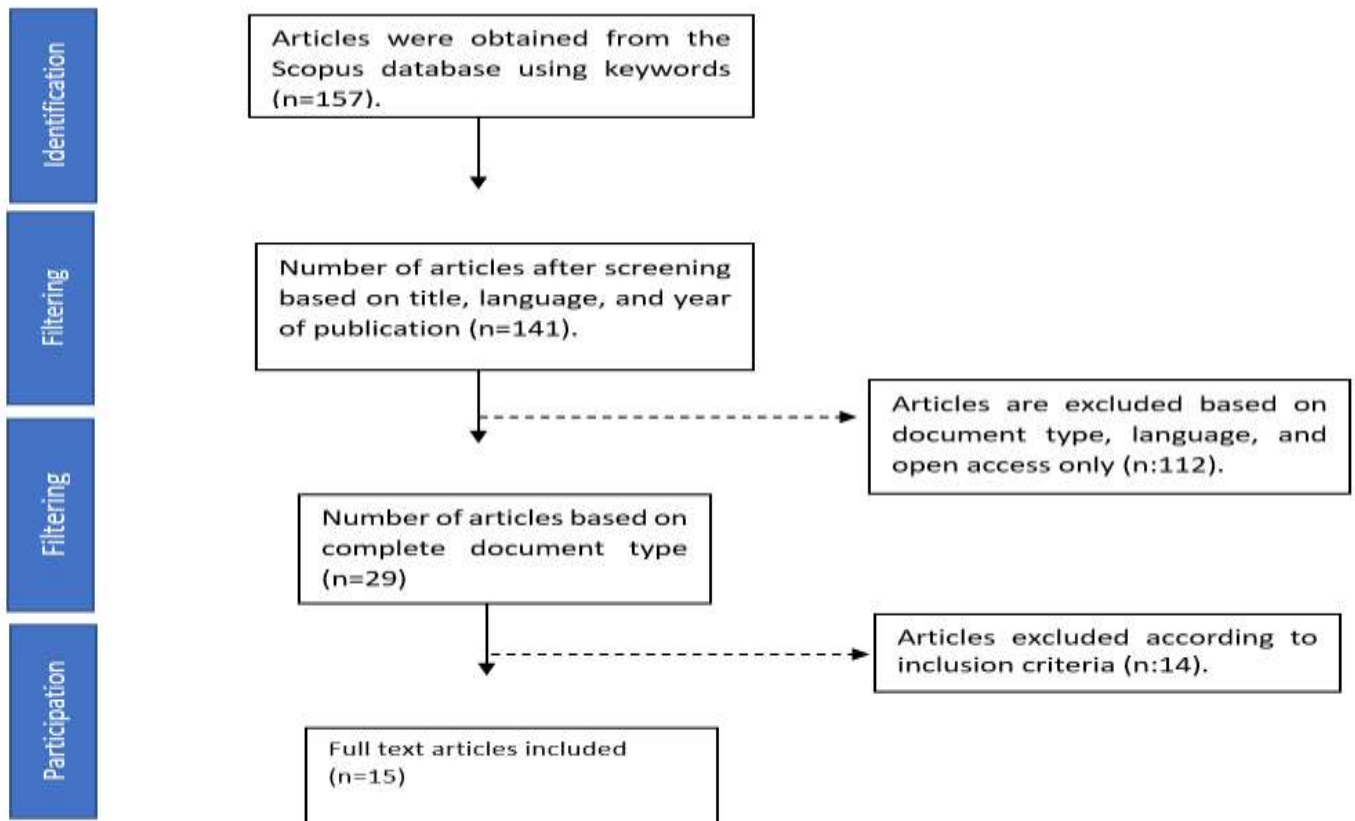


Figure 1: PRISMA research flowchart

Author's Name and Year	Research Methods and Types	Research Objectives	Research Results
Wang, Teo & Janssen (2021) [13]	Field Survey, Quantitative, 492 respondents	Analyzing the relationship between the use of AI voice robots and the creation of public/private value in China's public sector	The use of AI voice robots is positively correlated with personal values (usefulness and enjoyment) and procedural fairness; however, it does not significantly affect trust in the government.
Vassilakopoulou et.al (2023) [14]	Clinical research, qualitative.	Exploring human–AI interactions in chat-based customer service in the Norwegian government	Reflective intervention encourages service agents to discover new affordances in chatbot use; human-AI collaboration opens up opportunities for hybrid services.
Schmager et.al 2023 [15]	Exploratory study, qualitative interviews with 20 participants.	Exploring Norwegians' attitudes toward the use of AI in public services.	People's attitudes tend to be positive due to trust in the government, human involvement, and transparency of the AI process
Schaefer et.al 2021 [16]	Semi-structured interviews using a grounded theory approach with 12 German city governments.	Identifying challenges in AI adoption from the perspective of local government employees in Germany	Uncovering 10 perceptual challenges in adopting AI and expanding the TOE framework.

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Misra et.al 2023 [17]	Focus groups, interactive structural modeling approach	Identifying key challenges to AI adoption in Indian government organizations	15 challenges were identified and organized into a hierarchical framework; results can be used as a mitigation guide
Merhi 2021 [18]	Quantitative study using analysis hierarchy process (AHP)	Assessing the success factors of data intelligence implementation in the public sector	Technological factors (project management, information systems, data quality) are most important for success.
Maragno et.al 2023 [19]	Case studies of eight European public sector organizations, abductive approach	Explaining the factors, affordances, and constraints in AI implementation in the public sector	AI brings affordances and constraints that are interrelated with the organizational context; TOE and TACT are used as a dual lens.
Lyu et.al 2023 [20]	Sentiment analysis text mining, Word2Vec, and LDA for YouTube reviews	Revealing user acceptance of AI-based interactive human-robot service robots	Users are more concerned about human-robot collaboration even though interactive technology can recognize users' voices, gestures, and emotional states.
Henk & Nilssen 2021 [21]	Case study, qualitative, focus group.	Examining how the implementation of AI chatbots affects the characteristics of public service jobs	AI chatbots are impacting the jobs of frontline workers, but human touch is still needed in service work.
Gualdi & Cordella 2021 [22]	Theoretical study, literature review, and critical analysis of AI adoption in the public sector.	Analyzing the impact of AI on decision-making and accountability in the public sector	The adoption of AI causes techno-legal entanglement that affects accountability in decision-making in the public sector.
Fatima et.al 2021 [23]	Science design, adaptation of business models in the public sector using AI	Adapting the Business Model Canvas to create and capture AI-based public value	Customized BMCs can be used to optimize the implementation of AI in public services.
Dwivedi et.al 2019 [24]	A systematic review of the literature on the challenges and opportunities of AI	Developing a research agenda on AI in the public sector, management, and technology	Highlighting the major challenges and opportunities of AI, with a focus on policy and further research for AI implementation in the public sector
Ashoka et.al 2022 [25]	A systematic review of the literature on AI ethics and digital technology	Identifying ethical implications in the application of AI and digital technology across various sectors	Providing an ethical framework for AI that focuses on considerations of responsibility, fairness, and privacy in the implementation of technology.
Asatiani et.al 2021 [26]	Exploratory case study on the application of AI in organizations	Analyzing how organizations deal with the challenges of inscrutable AI systems	Introducing the concept of "sociotechnical envelopment" to manage unexplainable AI models in organizations
Agerfalk et.al 2022 [27]	Review and roadmap of AI research in information systems, identifying challenges and opportunities	Developing a research roadmap for AI in the context of information systems with a focus on practical application	Developing research directions and implementation challenges for AI in information systems that must be addressed by the academic community and practitioners.

III. DISCUSSION

The integration of Artificial Intelligence (AI) in public services presents both immense opportunities and significant challenges. As governments and public sector organizations continue to explore AI's potential, they face a delicate balance between

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embracing innovation and addressing the ethical, policy, and implementation barriers that come with it. This discussion synthesizes the findings from the literature, analyzing the potential benefits, ethical implications, and challenges that AI adoption poses in the public sector.

AI holds considerable promise in transforming public services by improving efficiency, reducing costs, and enhancing decision-making. According to [13], AI voice robots have proven effective in creating public value by enhancing user experience and facilitating procedural justice in government services. The adoption of AI-powered tools such as chatbots, predictive maintenance systems, and data-driven decision-making platforms can streamline government operations, increase responsiveness, and improve the overall quality of services provided to citizens. These advancements in sectors like healthcare, law enforcement, and education showcase AI's transformative potential in addressing public sector needs.

However, as AI becomes more integrated into public services, ethical concerns surrounding its use have become a focal point of discussion. Issues such as algorithmic bias, data privacy, and the lack of transparency in AI decision-making processes are pressing concerns for both policymakers and citizens. [17] highlight how AI models, if not carefully monitored, can introduce unintended biases, leading to discriminatory outcomes, particularly in sensitive areas like criminal justice and social services. Furthermore, the complexity and opacity of many AI systems make it difficult for citizens to understand how decisions are made, which can erode public trust in government institutions. This lack of explainability and accountability is a significant barrier to the ethical deployment of AI in public services.

Alongside ethical challenges, the adoption of AI in the public sector is often hindered by regulatory and policy limitations. As identified by [24], there is a lack of coherent governance frameworks that address the fast-evolving landscape of AI technologies. Governments must implement clear policies that not only encourage innovation but also ensure the protection of citizens' rights. As the technology advances, regulatory frameworks need to evolve rapidly to manage new ethical, legal, and social implications that arise. Without proactive policy development, AI deployment in public services risks becoming fragmented and inconsistent across different regions and sectors.

The operational challenges associated with AI implementation are also significant. Many public sector organizations struggle to integrate AI into their existing systems due to limitations in technical expertise, infrastructure, and financial resources. The resistance to technological change within bureaucratic structures further complicates the adoption process. Successful AI implementation requires more than just technological solutions—it demands a comprehensive strategy that includes organizational change management, training, and capacity-building to ensure that AI systems are effectively adopted and utilized across various levels of government.

Despite these challenges, AI presents substantial opportunities for improving public service delivery. By leveraging AI, public institutions can enhance their decision-making processes, reduce inefficiencies, and provide better services to citizens. However, these opportunities must be balanced with careful consideration of ethical principles, robust governance, and sound implementation strategies. As highlighted by [19], the interplay of affordances and constraints within the context of AI adoption can guide governments in making informed decisions about the technology's implementation.

IV. CONCLUSIONS

The integration of Artificial Intelligence (AI) in public services has proven to be a transformative force with the potential to significantly improve service delivery, efficiency, and transparency. However, while the benefits are substantial, there are also considerable challenges that must be addressed to ensure that AI is implemented responsibly and effectively in the public sector. This review highlights the key opportunities and barriers to the adoption of AI in public services, examining it from ethical, policy, and operational perspectives. From an ethical standpoint, AI has the potential to introduce biases in decision-making, raising concerns about fairness and equality, which need to be mitigated through transparent algorithms and robust accountability frameworks. Additionally, the lack of clarity and consistency in policy frameworks hampers the smooth implementation of AI, especially in public institutions that are often bound by bureaucratic structures. Regulatory measures must evolve to keep pace with the rapid advancements in AI technology, ensuring that they are flexible enough to accommodate new challenges while protecting citizens' rights and privacy. The operational challenges are also significant, as many public sector organizations struggle with integrating AI into their existing systems due to resource constraints and resistance to change within bureaucratic settings. Despite these challenges, the opportunities for AI to enhance public services remain clear, particularly in areas such as healthcare, education, and law enforcement, where AI can offer substantial improvements in efficiency and decision-making. By striking a balance between innovation and governance, AI can contribute to more effective public sector operations. However, this requires careful consideration of the ethical, policy, and technical implications of AI adoption. Moving forward, governments must adopt a holistic approach to AI implementation that not only embraces its technological capabilities but also addresses the social, legal,

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and ethical dimensions. This review serves as a comprehensive analysis of the opportunities and challenges of AI in public services and provides actionable insights for researchers, policymakers, and practitioners working to navigate this complex landscape.

ACKNOWLEDGMENT

The author would like to thank everyone involved in this research as they continue to be committed and dedicated to writing this scientific article. Their input and their invaluable time have been crucial to this research.

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