

ARTIFICIAL INTELLIGENCE-BASED GOVERNMENT MANAGEMENT TRANSFORMATION IN IMPROVING THE QUALITY OF PUBLIC SERVICES IN THE ERA OF DIGITAL GOVERNANCE

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Abstract

This study aims to analyze the transformation of government management based on artificial intelligence in improving the quality of public services in the era of digital governance. The study focuses on the use of AI in public-service delivery, administrative decision-making, and bureaucratic efficiency, while also examining the need for accountability and public ethics in its implementation. This research uses a qualitative method with an exploratory-descriptive and conceptual model-building approach. Data were collected through secondary and documentary sources, including recent peer-reviewed journal articles, policy documents, institutional reports, and regulatory materials related to AI governance, digital government, public administration, and public-service innovation. The data were analyzed using thematic analysis to identify key patterns related to AI utilization, organizational readiness, decision-support systems, ethical risks, and accountability mechanisms. The findings show that AI can improve public services through automation, intelligent citizen interaction, complaint classification, document verification, and predictive service delivery. AI also supports bureaucratic efficiency by reducing repetitive administrative tasks, improving data-based decision-making, and strengthening service monitoring. The main contribution of this study is the formulation of an adaptive AI-based government management model consisting of five dimensions: AI-enabled service innovation, data-driven decision support, bureaucratic workflow redesign, human oversight, and ethical-accountable governance. This model emphasizes that AI transformation in government must be supported by institutional capacity, transparent procedures, human supervision, and public-value orientation.

Keywords: artificial intelligence; digital governance; government management; public accountability; public service.

1. INTRODUCTION

The transformation of public administration in the digital governance era is increasingly shaped by the integration of artificial intelligence into government management systems. Artificial intelligence is no longer viewed merely as a technical instrument for automation, but as a strategic component of public-sector transformation that can influence how governments design services, process information, allocate resources, and make administrative decisions. Recent studies show that AI adoption in public governance has expanded from experimental digital tools to more complex applications involving data analytics, predictive modelling, automated classification, intelligent chatbots, decision-support systems, and algorithmic risk assessment [1], [2]. This development is closely related to the growing demand for public services that are faster, more responsive, personalized, transparent, and capable of handling large volumes of citizen interaction. In this context, AI-based government management offers potential value by reducing repetitive administrative burdens, improving the consistency of service processes, supporting evidence-based policy, and strengthening institutional responsiveness [3]. At the same time, the use of AI in government requires organizational transformation, not only technological procurement. Public institutions must redesign routines, data governance, human-resource capabilities, accountability structures, and ethical safeguards so that AI can generate public value instead of simply accelerating existing bureaucratic inefficiencies [4], [5].

The urgency of this study is grounded in the persistent problems faced by many public institutions in delivering high-quality services. Bureaucratic fragmentation, slow administrative procedures, limited interoperability among government databases, inconsistent decision-making, unequal access to digital services, and weak feedback mechanisms continue to affect citizens' trust in public administration. AI has the capacity to address several of these problems through intelligent service platforms, AI-based self-service technologies, predictive service delivery, automated document processing, and real-time citizen assistance [6]. Empirical research on AI in public services indicates that citizens' acceptance of AI depends not only on the availability of technology, but also on perceived

usefulness, fairness, service context, and the extent to which government can explain the role of AI in administrative processes [7]. Government chatbots, for instance, can improve service accessibility when designed with appropriate social characteristics and interaction modes [8]. AI-based data analytics can also support early crisis detection and resource allocation, especially in policy areas that require timely administrative responses [9], [10]. These findings suggest that AI can become a managerial instrument for improving public-service quality when it is integrated into governance processes rather than treated as an isolated digital application.

Despite its potential, AI-based government management raises serious challenges related to accountability, privacy, transparency, procedural fairness, and public ethics. The use of behavioral data, predictive algorithms, and automated decision-support systems may create new risks, including algorithmic bias, opaque decision-making, surveillance-oriented governance, and exclusion of citizens who lack digital access or algorithmic literacy [11]. Explainable AI has been proposed as one response to the opacity of algorithmic decision-making, but explainability in government is not a purely technical matter; it is shaped by legal mandates, institutional trust, social contestation, and the normative character of public decisions [12]. Research also shows that algorithmic transparency can increase perceived trustworthiness when citizens are given accessible and meaningful explanations regarding automated decisions [13]. The type of explanation matters, as citizens' perceptions of fairness, accuracy, and trustworthiness may vary depending on whether explanations are input-based, case-based, group-based, or counterfactual [14]. Public acceptance is also influenced by the type of algorithm used in public affairs, with rule-driven algorithms often perceived as fairer and more acceptable than data-driven algorithms in certain administrative contexts [15]. These concerns demonstrate that AI-based public service innovation must be accompanied by ethical governance, human oversight, and accountable institutional arrangements [16].

Recent literature has developed several important perspectives on AI in public administration and digital governance. Zuiderwijk et al. [1] systematically mapped the implications of AI in public governance and emphasized the need for research that connects technical AI implementation with institutional, ethical, and societal dimensions. Madan and Ashok [17] examined AI adoption and diffusion in public administration, identifying tensions between efficiency, fairness, transparency, privacy, and public value. Maragno et al. [18] analyzed factors, affordances, and constraints in implementing AI in public-sector organizations, showing that AI implementation depends on organizational capacity, institutional readiness, data quality, and managerial alignment. De Almeida and dos Santos Jr. [19] further advanced the discussion by examining how public organizations operationalize AI governance through ethical principles, internal procedures, and risk-management mechanisms. Wilson and van der Velden [20] proposed sustainable AI as a model for public-sector decision-making that integrates environmental, social, and institutional responsibility. In local government studies, Yigitcanlar et al. [21] proposed a responsible urban innovation framework for local government AI, while Yigitcanlar, Agdas, and Degirmenci [22] highlighted city managers' perceptions of AI prospects, constraints, and strategic choices. Related empirical studies also show that public perceptions of AI in urban and local government services are influenced by usefulness, ease of use, cultural context, and perceived service benefits [23], [24].

Other studies have focused more specifically on AI-enabled decision-making, public managers' competencies, service innovation, and the dark side of intelligent algorithms. Alshahrani et al. [25] mapped opportunities and challenges of AI in government decision-making and emphasized that AI can support strategic, operational, and policy decisions when institutional governance is adequate. Sandoval-Almazan et al. [26] found that public managers' AI competencies are crucial for successful implementation, especially in local government settings where managerial capacity often determines whether digital innovation becomes sustainable. Valle-Cruz, García-Contreras, and Gil-García [27] examined negative impacts of AI in government, including accountability gaps, algorithmic discrimination, and ethical risks associated with intelligent algorithms and cognitive machines. Hong et al. [28] contributed to digital innovation literature by identifying determinants of digital innovation in the public sector, while Chohan and Hu [29] emphasized the importance of digital inclusion and competency-building for strengthening e-government outcomes. Van Noordt and Tangi [30] further showed that AI capability influences public value creation, indicating that public organizations must develop not only technological capacity but also strategic, managerial, and governance capabilities. Taken together, these studies provide a strong foundation for understanding AI as both an administrative innovation and a governance challenge.

Although previous research has examined AI adoption, AI governance, public-sector decision-making, chatbot services, digital innovation, and ethical risks, there remains a conceptual gap in explaining how AI can be integrated into an adaptive model of government management that simultaneously improves service quality, supports bureaucratic efficiency, strengthens decision-making, and preserves public accountability. Much of the existing literature discusses AI either as a technological tool, an adoption challenge, an ethical dilemma, or a public-service innovation. Fewer studies offer an integrated government management model that links AI utilization, organizational adaptation, bureaucratic workflow redesign, human oversight, accountability mechanisms, and public ethics within one coherent framework. This study addresses that gap by proposing an adaptive AI-based government management model for improving the quality of public services in the era of digital governance. The study aims to analyze how AI

can be used in public-service processes, administrative decision-making, and bureaucratic efficiency, while ensuring that its implementation remains accountable, transparent, ethical, and oriented toward public value.

2. RESEARCH METHODS

This study employs a qualitative research design with an exploratory-descriptive approach. The qualitative method is considered appropriate because the study does not aim to test statistical relationships or measure the effectiveness of a specific AI algorithm quantitatively. Instead, it seeks to understand how artificial intelligence can transform government management, improve public-service processes, support administrative decision-making, and increase bureaucratic efficiency within the broader framework of digital governance. The study is also supported by a conceptual model-building approach, since its main novelty is to formulate an adaptive AI-based government management model that integrates service quality, organizational adaptation, ethical governance, human oversight, and public accountability. In this sense, AI is not treated as a technical algorithm to be trained or tested, but as a governance instrument that must be analyzed from managerial, institutional, and ethical perspectives [1], [17], [18].

The case study of this research focuses on AI-based public service management within government institutions in the digital governance era, particularly in the context of public-service delivery, administrative decision-making, and bureaucratic workflow transformation. The study places government institutions as the main unit of analysis, with attention to how AI can be applied in service portals, digital complaint systems, automated document processing, citizen-facing chatbots, decision-support systems, and data-driven policy formulation. The case study is designed as an institutional and managerial case rather than a single-application evaluation. This means that the research examines AI adoption as part of government management transformation, including changes in organizational structure, data governance, human-resource capacity, service standards, accountability mechanisms, and ethical control. This approach is relevant because previous studies show that successful AI implementation in the public sector depends not only on technological readiness, but also on institutional capacity, public trust, explainability, and responsible governance [3], [12], [19].

The data used in this study are collected from secondary and documentary sources, consisting of peer-reviewed journal articles published within the last five years, official government documents related to digital governance and public-service transformation, policy reports, regulatory documents, and institutional publications concerning AI governance in the public sector. The literature sources are selected from reputable academic databases and journals, especially those discussing artificial intelligence in public administration, digital government, public-service innovation, algorithmic accountability, explainable AI, and ethical governance. Data collection is conducted through systematic document identification, relevance screening, thematic classification, and content analysis. The collected data are then analyzed using qualitative thematic analysis, focusing on several key themes: AI utilization in public services, AI-supported decision-making, bureaucratic efficiency, organizational readiness, ethical risks, accountability, transparency, and public value creation. The results of this analysis serve as the basis for constructing an adaptive AI-based government management model that is both innovation-oriented and normatively accountable.

3. RESULTS AND DISCUSSION

a. AI Utilization in Public-Service Delivery

The thematic analysis shows that artificial intelligence can transform public-service delivery through three main mechanisms: service automation, citizen interaction enhancement, and personalization of public services. AI-based service automation is reflected in the use of chatbots, virtual assistants, automated document verification, smart queuing systems, and AI-supported complaint-handling platforms. These applications allow government institutions to reduce repetitive administrative tasks and provide services beyond conventional office hours. The finding is consistent with Chen et al. [6], who argue that AI-based self-service technology can improve user experience in public service delivery when the system is easy to access, reliable, and responsive to citizens' needs. In the same direction, Ju et al. [8] demonstrate that government chatbots can increase citizen engagement when their interaction design reflects clarity, responsiveness, and appropriate social characteristics.

The analysis also indicates that AI can improve the quality of public services by enabling more adaptive and citizen-oriented service systems. Instead of applying uniform procedures to all service users, AI allows public institutions to process citizen data, identify service needs, classify complaints, and provide relevant responses more quickly. This supports the shift from bureaucratic service delivery toward data-driven and user-centered public administration. Gesk and Leyer [7] show that citizens are more likely to accept AI in public services when they perceive the system as useful, fair, and appropriate for the service context. This means that technological sophistication alone does not guarantee service quality. AI-based services must be designed with attention to accessibility, fairness, usability, and public trust.

A key result of this study is that AI improves public-service quality only when it is integrated into the broader management system of government institutions. AI applications that operate separately from institutional workflows may create fragmented services, duplicated databases, and inconsistent administrative responses. This finding strengthens Maragno et al. [18], who emphasize that AI implementation in public-sector organizations depends on

organizational readiness, data quality, managerial alignment, and institutional capacity. In this study, AI-based public-service transformation is not understood as the replacement of human officials, but as the redesign of administrative processes in which AI supports front-office services, accelerates back-office verification, and assists public managers in monitoring service performance.

b. AI-Supported Decision-Making and Bureaucratic Efficiency

The second finding shows that AI has strong potential to improve government decision-making through data processing, predictive analysis, risk identification, and evidence-based policy support. In government management, decision-making often requires the interpretation of large and complex data, including demographic information, citizen complaints, public-service records, budget data, social assistance databases, and disaster or crisis-related information. AI can help government institutions identify patterns, detect anomalies, and generate policy insights that are difficult to obtain through manual administrative processes. This finding is in line with Alshahrani et al. [25], who explain that AI can support strategic, operational, and administrative decision-making in government functions when supported by adequate institutional governance.

The analysis also finds that AI contributes to bureaucratic efficiency by simplifying workflows, reducing administrative delays, and improving consistency in decision-support processes. In routine administrative services, AI can assist in document classification, eligibility screening, data matching, fraud detection, and service prioritization. In budget and resource allocation, AI can support smarter distribution of public resources by analyzing needs, risks, and service demand. Valle-Cruz, Fernandez-Cortez, and Gil-Garcia [10] show that AI has potential in government budgeting by supporting data-based allocation and improving the rationality of public financial decisions. Wanckel [9] also emphasizes the relevance of big data algorithm systems for early crisis detection, particularly when government institutions must respond quickly to emerging risks.

The discussion reveals that bureaucratic efficiency should not be reduced to speed and automation. In public administration, efficient governance must remain connected to legality, fairness, accountability, and citizen protection. AI may accelerate service delivery, but it can also reproduce bias, strengthen administrative exclusion, or create opaque decision-making if the system is not properly governed. Valle-Cruz, García-Contreras, and Gil-Garcia [27] warn that the dark side of AI in government includes discrimination, accountability gaps, and excessive reliance on intelligent algorithms. Saura et al. [11] also note that behavioral data used in government AI systems can create privacy risks when data governance is weak. The finding of this study confirms that AI-supported decision-making must operate as an assistive mechanism, not as an autonomous substitute for public authority. Final administrative responsibility must remain attached to authorized public officials.

c. Adaptive AI-Based Government Management Model

The main analytical contribution of this study is the formulation of an adaptive AI-based government management model. The model consists of five interrelated components: AI-enabled service innovation, data-driven decision support, bureaucratic workflow redesign, human oversight, and ethical-accountable governance. These components form an integrated management framework in which AI is positioned as a strategic instrument for public value creation rather than a mere technical application. This model responds to the limitation of AI adoption approaches that focus mainly on technology procurement without sufficient attention to institutional adaptation, managerial capacity, and normative control.

The first component, AI-enabled service innovation, refers to the use of AI to improve accessibility, responsiveness, and personalization in public services. The second component, data-driven decision support, places AI as a tool for improving policy analysis, service monitoring, and administrative prioritization. The third component, bureaucratic workflow redesign, requires government institutions to restructure internal procedures so that AI can reduce duplication, accelerate verification, and improve coordination across units. This is consistent with Ahn and Chen [3], who show that AI-augmented public administration requires changes in employee perception, organizational readiness, and willingness to use AI. It also supports Tangi et al. [4], who argue that AI-based government transformation has sociotechnical implications that require organizational change, not only technological adoption.

The fourth and fifth components of the model are human oversight and ethical-accountable governance. Human oversight ensures that AI remains under the control of competent public officials, especially in decisions that affect citizens' rights, access to services, and administrative justice. Ethical-accountable governance requires transparency, explainability, privacy protection, audit mechanisms, and complaint channels for citizens affected by AI-supported decisions. This finding is closely related to de Bruijn et al. [12], who emphasize the importance of explainable AI in algorithmic decision-making, and Grimmelhuijsen [13], who shows that algorithmic transparency can influence citizens' trust in automated public decisions. Aoki et al. [14] further demonstrate that the type of explanation given to citizens affects their perception of fairness, accuracy, and trustworthiness.

Based on the analysis, the proposed model confirms that AI-based government management must balance **innovation and control**. AI can improve public-service quality and bureaucratic efficiency, but its legitimacy depends on accountability, ethical safeguards, and public value orientation. This position strengthens the argument of

Wilson and van der Velden [20], who propose sustainable AI for public-sector decision-making, and van Noordt and Tangi [30], who highlight the relationship between AI capability and public value creation. The model offered in this study contributes to the literature by integrating technological, managerial, and ethical dimensions into one adaptive framework for digital governance. Its practical implication is that government institutions should not begin AI transformation merely by adopting applications, but by preparing data governance, institutional capacity, human resources, legal accountability, and ethical supervision as part of a unified management strategy.

4. CONCLUSION

This study finds that the transformation of government management through artificial intelligence is not limited to the automation of public services, but involves a broader managerial shift in the way public institutions organize data, design service workflows, support decision-making, and maintain accountability. The findings show that AI can improve public-service quality through faster response systems, automated document verification, intelligent complaint management, citizen-facing chatbots, and predictive service delivery. AI also contributes to bureaucratic efficiency by reducing repetitive administrative work, supporting data-based policy formulation, and improving the consistency of administrative processes. Yet, these benefits can only be achieved when AI is integrated into institutional governance, organizational capacity, and ethical control mechanisms.

The main novelty of this study lies in the formulation of an adaptive AI-based government management model that combines five interrelated dimensions: AI-enabled service innovation, data-driven decision support, bureaucratic workflow redesign, human oversight, and ethical-accountable governance. This model offers a more integrated perspective than previous studies that often discuss AI in government separately as a technological tool, service innovation, decision-support mechanism, or ethical challenge. The proposed model emphasizes that AI-based transformation must be understood as a sociotechnical and managerial process, where technology, human capacity, institutional rules, and public values must operate together.

The findings also contribute to previous studies on AI adoption in public administration by showing that efficiency and innovation are insufficient indicators of successful AI implementation. In line with earlier research on algorithmic accountability, explainable AI, and responsible digital governance, this study confirms that public-sector AI must be supported by transparency, auditability, privacy protection, citizen complaint mechanisms, and clear allocation of responsibility. AI may accelerate administrative procedures, but legitimacy in public governance still depends on fairness, accountability, and citizens' trust. This study strengthens the argument that AI should function as an assistive instrument for public officials, not as an autonomous replacement for administrative authority.

This study has several limitations. Since it uses a qualitative and documentary-based approach, the proposed model has not yet been tested through direct fieldwork, institutional observation, interviews with public officials, or citizen-based evaluation. The study also does not measure the technical performance of specific AI systems or compare AI implementation across different government agencies. These limitations indicate that the model developed in this study remains conceptual and requires empirical validation in real administrative settings.

Future research is recommended to test the adaptive AI-based government management model through case studies in specific public-service sectors, such as population administration, social assistance, licensing, health services, disaster management, or local government complaint systems. Further studies may also use mixed methods by combining interviews, surveys, service-performance indicators, and citizen satisfaction data to measure the actual impact of AI on service quality, bureaucratic efficiency, and public trust. Comparative research across regions or countries would also be valuable to explain how legal frameworks, administrative culture, digital infrastructure, and institutional capacity influence the success or failure of AI-based government management.

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