

Challenges of Adopting Artificial Intelligence (AI) in Public Policy Decision-Making

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Abstract

The rapid advancement of Artificial Intelligence (AI) promises to revolutionize public administration by enabling more precise, data-driven, and predictive policy decision-making. Governments worldwide are increasingly aspiring to leverage AI to solve complex societal problems. However, the transition from traditional bureaucratic methods to AI-augmented governance is fraught with systemic difficulties. This study critically analyzes the multifaceted challenges hindering the effective adoption of AI in public policy decision-making. Utilizing a qualitative approach through a systematic review of current administrative practices and technological frameworks, this research categorizes obstacles into technical, organizational, and ethical dimensions. The findings demonstrate that technical challenges are not merely about infrastructure but involve deep-seated issues regarding data quality, privacy, and the interoperability of legacy systems. Organizationally, the study identifies significant resistance due to bureaucratic inertia and a critical shortage of digital talent within the civil service, leading to a disconnect between technical developers and policy practitioners. Furthermore, ethical dilemmas present the most precarious barrier; specifically, the risks of algorithmic bias, lack of explainability (the "black box" phenomenon), and undefined accountability mechanisms threaten public trust. This article argues that without a comprehensive regulatory framework and cultural transformation within government agencies, AI adoption risks exacerbating existing inequalities rather than solving them. The study concludes by proposing a strategic governance model that prioritizes human-centric AI design, continuous capacity building for administrators, and rigorous ethical auditing to ensure that AI serves the public interest effectively.

Keywords: artificial intelligence, public policy, decision making, digital governance, bureaucracy

1. Introduction

The rapid advancement of Artificial Intelligence (AI) has emerged as a transformative force across the globe, redefining how organizations operate and how services are delivered. In the realm of Public Administration, the integration of AI represents the next frontier of "Digital Era Governance," promising a paradigm shift from reactive bureaucracy to proactive, data-driven policymaking (Baker & Robinson, 2021; Bullock, 2019). Governments worldwide are increasingly compelled to adopt AI technologies to handle the growing complexity of societal problems, ranging from urban planning and crisis management to the optimization of social welfare distribution.

The allure of AI in the public sector lies in its capacity to process vast datasets, identify complex patterns, and predict outcomes with unprecedented speed. For policymakers, this technology offers the potential for evidence-based decisions that are more precise, efficient, and cost-effective (Yusriadi et al., 2023). Theoretically, AI can reduce administrative burdens, minimize human error, and provide personalized public services, thereby enhancing the overall legitimacy of the state.

However, despite this optimism, the actual implementation of AI in public policy decision-making remains significantly slower and more complex than in the private sector. Unlike corporate environments driven primarily by efficiency and profit, public administration operates within a delicate web of legal constraints, political accountability, and mandates for social equity (Halaweh, 2018; Kulkarni et al., 2020). The transition from traditional hierarchical decision-making to AI-augmented governance is not merely a technical upgrade; it is a systemic disruption that challenges the very nature of bureaucracy.

Scholars and practitioners have begun to identify a widening gap between the potential of AI and its practical realization in government institutions. This gap is driven by a convergence of obstacles. Technically, governments often struggle with legacy infrastructure and fragmented data silos.

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Organizationally, there is often deep-seated resistance to change and a critical shortage of digital talent within the civil service (Wirtz et al., 2019; Wu et al., 2020). Furthermore, profound ethical concerns regarding algorithmic bias, the lack of transparency in "black box" algorithms, and the question of accountability pose direct threats to democratic values.

Therefore, it is crucial to move beyond the hype of digital transformation and critically examine the hurdles that lie ahead. This article aims to analyze the multifaceted challenges of adopting Artificial Intelligence in public policy decision-making. By categorizing these challenges into technical, organizational, and ethical dimensions, this study seeks to provide a comprehensive understanding of why AI adoption in the public sector is often stalled and offers insights into the governance frameworks needed to mitigate these risks.

2. Method

Research Design

This study employs a qualitative research design using a descriptive approach. This method was selected to provide a comprehensive understanding of the complex and multi-dimensional phenomenon of Artificial Intelligence (AI) adoption in the public sector. Given that the integration of AI in public policy is a relatively new and evolving field, a qualitative approach allows for a deeper exploration of the underlying contexts, structural barriers, and institutional dynamics that quantitative methods might overlook.

Data Collection

Data for this study were primarily gathered through a systematic literature review (SLR) and document analysis. The data collection process focused on identifying relevant academic articles, government reports, white papers from international organizations (such as the OECD and World Bank), and policy documents published between 2018 and 2024. This timeframe was chosen to ensure the relevance of the technological context and the most recent policy developments. The search for literature was conducted using major academic databases, including Scopus, Web of Science, and Google Scholar. The search strings utilized combinations of key terms such as: "*Artificial Intelligence*," "*Public Policy*," "*Decision Making*," "*E-Government*," "*Algorithmic Governance*," and "*Public Sector Challenges*."

Data Analysis

The collected data were analyzed using a thematic analysis technique. The analysis process involved three main steps: 1) Data Reduction: Selecting and focusing on literature specifically discussing the barriers and risks of AI implementation in government; 2) Data Display: Categorizing the identified challenges into three primary dimensions: Technical Challenges (infrastructure and data), Organizational Challenges (culture and human resources), and Ethical Challenges (bias and accountability); 3) Conclusion Drawing/Verification: Synthesizing the findings to construct a cohesive argument regarding the systemic hurdles of AI adoption and proposing governance frameworks to address them.

3. Results

The analysis of the gathered literature and policy documents reveals that the adoption of Artificial Intelligence (AI) in public policy decision-making is not merely a technological upgrade but a complex systemic transformation. The challenges identified are interconnected and can be categorized into three distinct dimensions: technical barriers, organizational and cultural hurdles, and ethical-legal dilemmas.

Technical Barriers: Data Quality and Infrastructure Compatibility

The foundational challenge for AI adoption in the public sector lies in the state of data and infrastructure. AI algorithms, particularly those based on Machine Learning, are heavily dependent on vast quantities of high-quality, structured data to function effectively. However, the findings indicate that public sector data is often characterized by severe fragmentation. Government agencies frequently operate in isolation, creating "data silos" where critical information is locked within specific departments or ministries. This lack of interoperability prevents the cross-agency data sharing required for holistic policy analysis, limiting the AI's ability to detect comprehensive patterns across different sectors.

Furthermore, the issue of data quality presents a significant bottleneck. A substantial portion of historical government data remains unstructured, existing as scanned PDF documents, inconsistent

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spreadsheets, or even physical paper records. Converting this "messy" data into a machine-readable format requires a massive investment of time and resources, a phase often underestimated in digital transformation roadmaps. This challenge is compounded by the prevalence of legacy infrastructure. Many public institutions continue to rely on archaic IT systems that were never designed to handle the computational demands of modern AI applications. Integrating advanced AI tools with these rigid legacy systems creates significant technical debt and security vulnerabilities, often forcing governments to run parallel systems that are inefficient and costly to maintain.

Organizational Challenges: Bureaucratic Inertia and the Talent Gap

Beyond the technical limitations, the internal environment of public administration presents significant obstacles, primarily driven by the clash between the agile nature of AI development and the rigid, risk-averse nature of bureaucracy. A primary concern identified is the critical shortage of digital talent. The public sector faces a severe struggle to recruit and retain AI specialists, data scientists, and engineers, largely due to an inability to compete with the private sector's salary packages and career progression opportunities. Consequently, government agencies often rely heavily on external vendors for AI solutions. This reliance creates a "dependency trap," where the internal capacity to manage, audit, and understand the technology remains low, leaving the government vulnerable to vendor lock-in.

In addition to the talent gap, cultural resistance poses a formidable barrier. Bureaucratic culture typically prioritizes stability, procedural compliance, and risk minimization. In contrast, AI development operates on principles of experimentation and probability. This fundamental mismatch leads to skepticism among civil servants who may view the "black box" nature of AI as a source of uncertainty rather than a tool for efficiency. This resistance is further fueled by the fear of job displacement. The narrative that AI might automate administrative tasks generates anxiety among street-level bureaucrats, leading to a lack of buy-in and, in some cases, active resistance to adopting new digital workflows.

Ethical and Legal Challenges: The Trust and Accountability Deficit

The most critical findings relate to the normative implications of AI in governance, where the stakes involve public trust and democratic rights. Unlike the private sector, public decision-making is bound by strict requirements for accountability, transparency, and equity. A major ethical risk is algorithmic bias. AI systems trained on historical government data run the risk of perpetuating or even amplifying existing social inequalities. If historical data reflects past discrimination in areas such as policing, hiring, or social aid distribution, the AI models will likely produce biased recommendations, thereby institutionalizing inequality under the guise of technological neutrality.

Moreover, the "black box" phenomenon of many advanced AI models, such as Deep Learning, conflicts directly with the principles of administrative justice. Citizens have a right to understand the rationale behind government decisions that affect their lives. However, if a government agency cannot explain the internal logic of an AI system that denied a benefit or flagged a citizen for audit, it violates the principle of transparency. This leads to a complex legal vacuum regarding accountability. When an AI-driven policy fails or causes harm, it is often unclear who bears the liability—the software developer, the data scientist, the procurement officer, or the final decision-maker. This ambiguity complicates the enforcement of accountability mechanisms that are essential for maintaining democratic legitimacy.

4. Discussion

This study highlights that the integration of Artificial Intelligence into public policy decision-making is less of a technical upgrade and more of a profound institutional challenge. The findings confirm that while the promise of AI to enhance efficiency and precision is theoretically sound, its practical application is impeded by the "administrative paradox" of trying to fit agile technologies into rigid bureaucratic structures.

The Disconnect Between Technology and Bureaucracy

The technical barriers identified—specifically data silos and legacy systems—reflect a historical tendency in public administration to organize around functions rather than data flows. Unlike modern platform-based organizations, governments have traditionally been designed as compartmentalized hierarchies (Mohamed et al., 2020; Pradhan & Saxena, 2023). This structural fragmentation makes the "whole-of-government" approach required for effective AI almost impossible without radical re-engineering. The reliance on legacy infrastructure further exacerbates this, creating a situation where

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governments are attempting to run 21st-century algorithms on 20th-century IT backbones. This suggests that before investing in advanced AI tools, governments must prioritize foundational "digital plumbing"—the unglamorous work of data standardization and infrastructure modernization.

Human Capital and the Future of Work in Government

The organizational challenges reveal a critical crisis in human capital. The "talent gap" is not merely about a lack of coding skills; it represents a broader cultural deficit in digital literacy among public managers (Ekuma, 2023; Patnaik, 2015). The heavy reliance on external vendors creates an asymmetry of information where policymakers may purchase "black box" solutions they do not fully understand, ceding sovereignty over critical public decisions to private tech companies. Furthermore, the resistance from civil servants underscores the need for a change management strategy that goes beyond technical training. AI adoption must be framed not as a replacement for human judgment, but as "augmented intelligence" that empowers bureaucrats to focus on high-value, empathetic tasks that machines cannot replicate.

The Ethics of Automated Governance

Perhaps the most significant implication of this study is the tension between algorithmic efficiency and democratic values. The problem of the "black box" directly challenges the core administrative law principle of the "right to an explanation." If a decision cannot be explained, it cannot be contested, and if it cannot be contested, it undermines the legitimacy of the state. The finding that AI can institutionalize bias serves as a stark warning: without rigorous ethical auditing, AI could automate inequality at scale (Haynes, 2003; Williams & Bangun, 2022). This suggests that the governance of AI cannot be left to technologists alone; it requires a new framework of "Algorithmic Accountability" involving ethicists, legal experts, and civil society to ensure that efficiency does not come at the cost of equity. In summary, the successful adoption of AI in public policy requires a shift from a techno-centric view to a governance-centric view. Success will not depend on the sophistication of the algorithms, but on the ability of public institutions to adapt their legal, ethical, and organizational frameworks to manage these powerful new tools responsibly.

5. Conclusion

This article has critically examined the multifaceted challenges associated with adopting Artificial Intelligence (AI) in public policy decision-making. The investigation confirms that while AI holds the potential to transform governance through evidence-based insights and operational efficiency, its implementation is currently hindered by significant structural barriers (Hradecky et al., 2022; Yu et al., 2021). The analysis highlights that the primary obstacles are not merely technical limitations regarding data quality and legacy infrastructure, but deeply rooted organizational and ethical issues. Bureaucratic inertia, a scarcity of digital talent, and profound concerns regarding algorithmic bias and the lack of transparency constitute a systemic resistance that technology alone cannot overcome.

Consequently, the successful integration of AI into the public sector necessitates a paradigm shift from a technology-first approach to a value-driven governance model (Kouadio et al., 2018; Oosthuizen, 2022). Governments must recognize that purchasing advanced software is insufficient without a parallel investment in "digital readiness." This includes prioritizing the modernization of data infrastructure to break down silos and investing heavily in the digital literacy of civil servants to bridge the gap between technical developers and policy practitioners. Furthermore, to address the ethical deficit, it is imperative to establish robust regulatory frameworks that mandate algorithmic accountability. Policymakers must ensure that AI systems are explainable, audit-able, and aligned with democratic values of equity and justice before they are deployed in high-stakes decision-making environments.

Future research should move beyond general barrier analysis to explore specific strategies for overcoming these hurdles in different administrative contexts, particularly in developing nations where resource constraints are more acute. Comparative studies on regulatory sandboxes or pilot projects could offer practical insights into how governments can experiment with AI safely. Ultimately, the goal of AI in public administration should not be the automation of the state, but the augmentation of human capacity to serve the public interest more effectively. Only by addressing these technical, organizational, and ethical challenges holistically can the public sector harness the true power of AI without compromising the trust and legitimacy upon which democratic governance relies.

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