



The Impact of Artificial Intelligence on Public Sector Decision-Making: Benefits, Challenges, and Policy Implications

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ABSTRACT

Artificial intelligence (AI) is increasingly transforming government decision-making processes. This article presents a systematic literature review of 43 studies (2020-2025) examining AI's impact on public-sector decision-making, delineating its advantages, disadvantages, policy implications, technical aspects, and ethical concerns. The findings indicate that AI technologies offer significant benefits for government decision-making, including improved efficiency, data-driven insights, and enhanced service delivery (e.g., automation of routine tasks and predictive analytics). However, the integration of AI also presents notable drawbacks such as algorithmic bias, transparency deficits, accountability challenges, and ethical dilemmas in public governance. We discuss how these advantages and disadvantages inform policy responses and technical requirements for responsible AI use in the public sector. Key policy implications include the need for robust governance frameworks, regulatory oversight, and ethical guidelines to ensure accountability and public trust. Technical aspects such as data quality, system integration, and explainable AI are identified as critical factors for successful implementation. Ethical concerns—fairness, privacy, transparency, and public value alignment—are examined in light of emerging scholarly debates. The review offers an academically rigorous and up-to-date synthesis to guide researchers, policymakers, and practitioners in understanding the multifaceted impact of AI on government decision-making.

Keywords: Artificial Intelligence, Public Sector, AI technologies

JEL Classifications: H83, O33, D78, L86

1. INTRODUCTION

Governments around the world are adopting artificial intelligence (AI) tools to augment and inform decision-making in public administration and policy. AI refers to a broad class of technologies (including machine learning algorithms, predictive analytics, and automated decision support systems) that can analyze data, recognize patterns, and make or recommend decisions typically requiring human cognition. In the public sector, AI is being deployed for tasks ranging from service delivery enhancements to complex policy analysis. This trend is driven by promises of increased efficiency, improved accuracy, and data-driven decision processes in government (Caiza et al., 2024; Chohan et al., 2021; Khaddam and Alzghoul, 2025). For example, AI systems have been used to detect tax fraud, allocate healthcare resources,

manage traffic flows in smart cities, and support predictive policing and welfare eligibility decisions. The integration of AI into government decision-making is rapidly gaining traction in public administration and politics (Caiza et al., 2024), heralding what some scholars describe as a paradigm shift towards data-centric “algorithmic governance.”

Despite the potential benefits, the rise of AI in public decision-making also raises significant concerns (Babšek et al., 2025). Early implementations have revealed challenges related to algorithmic bias and discrimination, lack of transparency in automated decisions, difficulties in assigning accountability for AI-driven outcomes, and risks to privacy and due process (Busuioc, 2021; Henman, 2020; Janssen et al., 2022). Notably, studies have documented instances where AI systems in government produced

unintended and even harmful results, such as unjust outcomes in social services or biased risk assessments in criminal justice (Rinta-Kahila et al., 2022). These incidents underscore the need for careful consideration of the ethical and governance implications of AI use in the public sector (Kuziemski and Misuraca, 2020).

Given the opportunities and risks associated with AI, there is a burgeoning body of scholarly research examining how AI affects government decision-making. To provide a coherent understanding of this emerging field, we conduct a systematic literature review of recent high-quality studies (published 2020-2025) from major academic databases and publishers (including Scopus-indexed journals from Emerald, SAGE, Wiley, Inderscience, etc.). This review addresses the following questions: How is AI impacting government decision-making processes and outcomes? What are the key advantages and disadvantages of AI adoption in this context? What policy measures and governance frameworks are being proposed or implemented to address AI's implications? What technical factors influence AI implementation in public decisions? And what ethical concerns arise from integrating AI into public governance? By synthesizing findings across 43 studies, we aim to map the state of knowledge, highlight consensus and debates, and identify gaps for future research.

The remainder of this article is organized as follows. First, we outline the Methodology of our systematic review, including the search strategy, inclusion criteria, and analytical approach. Next, in Findings and Discussion, we present a structured analysis covering: (a) the impact of AI on government decision-making, (b) advantages and disadvantages of AI adoption in the public sector, (c) policy implications of these technological changes, (d) technical aspects critical to implementation, and (e) ethical concerns that must be addressed for responsible AI use. We include two tables summarizing the literature: Table 1 provides an overview of 20 key studies (out of the 43 reviewed) and their insights, and Table 2 delineates the main pros and cons of AI in government decision-making. Finally, the Conclusion reflects on the findings, offering conclusions and recommendations for policymakers and practitioners, and pointing to areas for further scholarly inquiry.

2. METHODOLOGY

This study employs a systematic literature review methodology to gather, evaluate, and synthesize existing research on AI's impact on government decision-making. We followed established guidelines for systematic reviews in social science (Tranfield et al., 2003) and the PRISMA 2020 reporting standards (Page et al., 2021) to ensure rigor and transparency in the review process. The review process involved several stages: defining the scope and research questions, identifying relevant literature through database searches, screening and selecting studies based on inclusion/exclusion criteria, extracting data and evidence from the selected studies, and analyzing and synthesizing the findings.

We focused on recent academic literature (published between 2020 and early 2025) to capture the latest developments and insights. Multiple academic databases and publisher platforms were

searched, including Scopus, Web of Science, IEEE Xplore, ACM Digital Library, and publisher databases such as Emerald Insight, SAGE Journals, Wiley Online Library, and Inderscience. We used a comprehensive set of search terms covering the key concepts: artificial intelligence, algorithmic, machine learning, government, public sector, decision-making, policy, governance, public administration, ethical, accountability, etc. For example, a sample search query in Scopus was: *TITLE-ABS-KEY ((“artificial intelligence” OR AI OR algorithmic) AND (government OR “public sector” OR “public administration”) AND (decision OR policymaking OR governance))**, filtering for year ≥ 2020 . Similar queries were adapted for other databases, sometimes using field codes to target titles, abstracts, and keywords (Caiza et al., 2024). This broad search strategy ensured coverage of studies that explicitly address AI in government decision-making, as well as those discussing related concepts (e.g., algorithmic governance, AI in public services) that might be relevant to our topic.

We included peer-reviewed journal articles, conference papers, and authoritative reports that provide empirical findings or substantial conceptual analysis regarding AI in the context of government or public-sector decision-making. Studies had to address at least one of our subtopics of interest (impact, advantages, disadvantages, policy, technical, ethical aspects of AI in government decisions). We focused on high-quality sources, prioritizing studies indexed in Scopus or published by reputable outlets (Emerald, SAGE, Wiley, Inderscience, IEEE, ACM, etc.), and additionally included a few seminal policy reports or books frequently cited in the academic literature for context (e.g., one U.S. report on federal AI use (Engstrom et al., 2020) and a widely cited global AI governance overview (Butcher and Beridze, 2019)). We excluded articles that were not in English, not focused on the public sector, or lacking substantive discussion of decision-making (e.g., papers on AI in healthcare or education unless they drew implications for government policy). After initial searches yielded a large pool of results, we screened titles and abstracts to eliminate clearly irrelevant items. This was followed by full-text screening of remaining candidates to ensure relevance and quality. Through this process, we narrowed the literature to 43 studies that met all criteria.

For each of the 43 studies, we extracted key information including publication details, research context (e.g., domain of government or country, if specified), methodology (e.g., case study, survey, experiment, conceptual analysis), and main findings related to AI's role in government decision-making. We then coded findings into thematic categories corresponding to our review questions. The coding was both deductive (pre-defined themes such as advantages, disadvantages, policy implications, technical factors, ethical issues) and inductive (allowing new themes or sub-themes to emerge from the data). For instance, under “advantages,” sub-themes like efficiency gains, accuracy improvement, cost savings, and personalization of services emerged. Under “disadvantages,” sub-themes included bias and fairness issues, opacity/transparency, accountability deficits, privacy risks, and implementation challenges. Two researchers independently coded a subset of studies to validate the coding scheme and then one researcher completed the coding for all studies, with periodic discussions to

Table 1: Summary of key studies on AI in government decision-making (2020-2025)

Study (Year)	Focus and methodology	Key findings/conclusions
Caiza et al. (2024)	Comprehensive literature review of AI's impact on public-sector decision-making (global scope).	AI offers substantial potential to improve government efficiency and service delivery, but significant challenges remain, including bias, transparency issues, public acceptance, and accountability deficits. Emphasizes need for balanced governance of AI's "double-edged" effects.
Zuiderwijk et al., (2021)	Systematic literature review (58 sources) on implications of AI in public governance; proposes research agenda (Europe-focused).	Identifies key challenges: public value threats (e.g., erosion of fairness, privacy), data issues, and societal governance issues. Calls for public value-driven AI design and stronger governance frameworks to ensure AI aligns with accountability, transparency, equality, and justice in public administration.
Yuan and Chen (2025)	Systematic review of accountability in AI-based public sector systems (Public Performance and Management Review).	The integration of AI into government processes introduces unique accountability challenges (e.g., "who is responsible for AI errors?"). Finds that traditional accountability mechanisms need adaptation. Recommends algorithm audits, clarity in legal liability, and maintaining human oversight to ensure accountability.
Alon-Barkat and Busuioc (2022)	Experimental studies (3 studies, N≈2800) on public officials' trust in algorithmic vs. human advice in decision-making (JPART).	Did not find evidence of blanket "automation bias" – officials didn't always over-rely on AI vs. expert human advice. However, found selective adherence: officials more likely to accept AI advice when it aligned with their preexisting stereotypes. A high-profile scandal (the Dutch childcare benefits algorithm) raised awareness and slightly reduced blind trust in AI. Highlights need for caution and training to mitigate biased adherence.
Ingrams et al. (2022)	Survey study on citizens' perceptions of AI in government decision-making (Policy and Internet).	Citizens' trust in AI-driven government services is mixed. Trust increases with perceived transparency and if AI use is seen as improving efficiency. However, concerns about fairness and privacy reduce support. Suggests that governments must actively build public trust (e.g., via transparency measures) for AI initiatives to be accepted.
Gesk and Leyer (2022)	Survey experiment on when/why citizens accept AI in public services (Government Information Quarterly).	Citizens are more likely to accept AI usage for decisions when the task is seen as technical/routine rather than value-laden. Acceptance is higher if AI use is transparent and if citizens perceive an option for human appeal. Concludes that perceived usefulness and procedural fairness are key to public acceptance of AI in government.
Rinta-Kahila et al. (2022)	Case study of the Australian "Robodebt" program (automated welfare debt collection) – qualitative analysis using systems thinking (European J. of Information Systems).	The AI-driven Robodebt system caused severe distress to citizens and was ultimately found unlawful. The study shows how a lack of human oversight, data quality issues, and organizational blind spots led to destructive outcomes. Concludes that robust governance and accountability checks are crucial. Provides generalizable mechanisms of how unchecked ADM (automated decision-making) can become socially destructive.
Henman (2020)	Conceptual analysis of AI's use in public services and associated governance challenges (Asia Pacific J. of Public Administration).	Reviews AI applications (automated decision systems, chatbots, public safety monitoring) and outlines four key challenges: (1) accuracy vs. error, (2) bias and discrimination, (3) legality and due process, (4) accountability and transparency. Argues that technological innovations must be accompanied by governance innovations (like ethics guidelines, oversight bodies) to address these challenges.
Fountain (2022)	Commentary on systemic racism in computational algorithms affecting government decisions (Government Information Quarterly).	Points out that data-driven algorithms can inadvertently encode systemic racism ("the moon, the ghetto, and AI" metaphor). Urges that governments critically examine AI tools for disparate impact. Suggests involving diverse stakeholders in design and implementing strong fairness audits to reduce racial or socioeconomic bias in automated decisions.
Wirtz et al. (2020)	Conceptual paper proposing an integrated AI governance framework for public administration (Int. J. of Public Administration).	Identifies "dark sides" of AI (bias, opacity, job displacement, security risks) and proposes a governance framework with components: strategic alignment with public values, stakeholder engagement, risk management (bias, privacy), and monitoring. Emphasizes proactive governance to harness AI benefits while mitigating downsides.
Chen et al. (2023)	Analysis of AI's impact on public values and governance (framework development) (Sustainability, MDPI).	Uses a taxonomy of public values (duty-oriented, service-oriented, social values) to assess AI implications. Finds that transparency, accountability, privacy, and fairness are recurrent value concerns. Proposes that governments adopt a public-value-oriented approach to AI governance (e.g., ensuring AI complies with laws and ethical duties, and enhances transparency and citizen responsibility).
Johnson et al. (2022)	Conceptual review of AI in public human resource management (Public Personnel Management).	AI applications in HR (hiring algorithms, employee analytics) can improve efficiency and objectivity in government hiring and workforce management. However, risks include biased recruitment algorithms and privacy issues with employee data. Recommends guidelines for fair AI use in HR and continuous validation of AI tools to ensure they meet merit-based hiring principles.
Yigitcanlar et al. (2021)	Conceptual framework for "Responsible Urban AI" in local government (Journal of Open Innovation).	Proposes a framework and research agenda for integrating AI in smart city governance responsibly. Key components include community engagement, ethical AI procurement, and continuous impact assessment. Stresses that local governments should pursue "responsible urban innovation," balancing efficiency gains with safeguards for privacy, equity, and inclusivity.

(Contd...)

Table 1: (Continued)

Study (Year)	Focus and methodology	Key findings/conclusions
Busuioc (2021)	Theoretical analysis of algorithmic accountability in public sector (Public Administration Review).	Examines how AI challenges traditional accountability in public administration. Highlights issues like the difficulty of oversight when algorithms are proprietary or complex, and the shifting of discretion from street-level bureaucrats to system designers. Argues for updating accountability regimes – including legal reforms and capacity-building – to ensure bureaucratic accountability in the age of AI.
Bracci et al. (2023)	Conceptual “intelligent accountability” research agenda (focus on accounting for algorithms in public services).	Observes that AI “reorganizes the chain of command” in public services, creating distributed responsibility. Suggests developing new accountability frameworks (intelligent accountability) that incorporate technical accountability (audit trails in algorithms) and governance accountability (clear roles for oversight). Recommends interdisciplinary research bridging public administration and accounting to tackle algorithmic accountability.
Grimmelikhuijsen (2023)	Experimental study on algorithmic transparency and trust (Public Administration).	Investigates how providing explanations for AI decisions affects citizens’ trust in those decisions (context: policing algorithms). Finds that algorithmic transparency (accessible explanations) significantly increases perceived trustworthiness of automated decisions. Concludes that to maintain public trust, agencies should implement explainable AI and communicate clearly about AI decision logic to the public.
Selten et al. (2023)	Experimental study with Dutch police officers on AI decision support (Public Administration Review).	Found that street-level bureaucrats (police officers) tended to trust AI recommendations when those confirmed their own intuition (“just like I thought” effect). Notably, adding AI-generated explanations (XAI) did not significantly change trust levels. The study suggests that confirmation bias is a concern and that even with XAI, human users might overweight AI advice that aligns with their preconceptions. Training is needed to mitigate automation bias and ensure critical use of AI recommendations.
Maragno et al. (2023)	Qualitative multiple-case study of AI implementation in public organizations (International J. of Information Management).	Explores factors, affordances, and constraints in adopting AI in public sector (based on several in-depth cases). Identifies critical success factors: top-management support, cross-department data integration, employee training, and pilot testing. Key constraints: legacy systems, data silos, and resistance to change. Concludes that both technical readiness and organizational readiness are necessary for effective AI uptake in government.
Maragno et al. (2022)	Case study on introducing chatbots in public agencies (Public Management Review).	Examines how a public entity implemented an AI chatbot and the organizational changes involved. Found that treating the AI as an “organizational agent” that needs nurturing (training with data, clear role definition, oversight) was effective. Highlights that even seemingly simple AI (chatbots) require process re-engineering and staff role adjustments. Chatbots improved responsiveness to citizen inquiries but needed continuous monitoring to handle complex queries appropriately.
Engstrom et al. (2020)	U.S. federal agencies report on AI use (ACUS report “Government by Algorithm”).	Surveyed AI adoption across various federal agencies. Found a wide range of uses from narrow automation to experimental predictive tools. Identified governance gaps: many agencies lacked formal policies on AI oversight. Recommended government-wide standards for transparency, bias testing, and pilot evaluations. Emphasized the importance of inter-agency knowledge sharing and developing capacity so agencies aren’t overly reliant on contractors for AI expertise.

A selection of 20 key studies from 2020 to 2025 on AI in government decision-making, summarizing their focus and main insights. These studies collectively cover literature reviews, empirical research (experiments, surveys, case studies), and conceptual frameworks, offering a broad view of current scholarship in this domain

resolve ambiguities. We synthesized the findings by aggregating evidence for each thematic category and noting points of consensus or divergence among the studies.

The systematic approach of this methodology ensures that our review is comprehensive and unbiased. By clearly documenting the search strategy and selection criteria, we increase the reproducibility of the review. Moreover, summarizing evidence from diverse studies (spanning multiple countries and governance contexts) allows us to draw generalized insights about how AI is influencing government decision-making. The next section presents the findings of the review, structured according to the key themes and supported by representative studies and examples.

3. FINDINGS AND DISCUSSION

AI is having a multifaceted impact on how decisions are made in the public sector. Broadly, the literature indicates that AI technologies are being used as decision support systems as well as in some cases for fully automated decision-making in government processes. By processing vast amounts of data with speed and precision, AI can uncover patterns and generate insights that inform policy and administrative decisions (Misuraca and van Noordt, 2020; Zuiderwijk et al., 2021). For example, predictive modeling and machine learning algorithms enable evidence-based decision-making by forecasting outcomes under different scenarios – such as predicting which infrastructure projects might yield the highest public benefit or identifying fraud in social

Table 2: Pros and cons of AI adoption for government decision-making

Advantages (Pros)	Disadvantages (Cons)
<p>Increased efficiency and speed: AI automates routine tasks and processes decisions much faster than human bureaucrats, reducing processing times and operational costs (Henman, 2020; Caiza et al., 2024). This leads to quicker service delivery (e.g., faster benefit approvals) and allows public employees to focus on higher-value work instead of manual data processing.</p> <p>Improved consistency and accuracy: AI applies rules uniformly, minimizing human errors and inconsistencies. This can enhance the accuracy of decisions in rule-based tasks – for example, detecting fraud patterns or eligibility errors that humans might miss (Janssen et al., 2022). It also ensures similar cases are treated alike, bolstering procedural fairness (Geske and Leyer, 2022).</p> <p>Data-driven decision-making: AI can analyze vast datasets to provide evidence-based insights and predictive analytics for policy decisions (Misuraca and van Noordt, 2020). This improves the knowledge base of decisions – e.g., predicting infrastructure needs, identifying at-risk populations – enabling more proactive and informed policymaking (Valle-Cruz et al., 2022). Decisions backed by data analytics can be more objective and outcome-focused.</p> <p>Enhanced capacity and productivity: AI systems operating continuously can handle large workloads (24/7 processing), effectively increasing an agency's capacity without equivalent increase in staff (Bokhari and Myeong, 2022). This can be critical in areas with growing service demands and constrained budgets. Governments can potentially achieve more output with the same or fewer resources, improving productivity.</p>	<p>Bias and fairness issues: AI systems can inherit or amplify biases present in training data, leading to discriminatory outcomes in public decisions (Fountain, 2022; Zuiderwijk et al., 2021). Without careful design, algorithms may unfairly target or disadvantage certain groups – as seen in cases of biased predictive policing or social service algorithms. This raises serious equity and social justice concerns.</p> <p>Lack of transparency (“Black Box”): Many AI algorithms (especially complex machine learning models) are not easily interpretable. This opacity makes it hard for officials and citizens to understand how a decision was made (de Bruijn et al., 2022). The “black-box” nature undermines transparency and accountability, conflicting with the public's right to explanation and reducing trust in automated decisions.</p> <p>Accountability gaps: AI complicates the assignment of responsibility. When an algorithm makes a flawed decision, it's unclear who is accountable – the developer, the vendor, the agency, or the frontline official? (Yuan and Chen, 2025). This diffusion of responsibility challenges traditional bureaucratic accountability (Busuioac, 2021).</p> <p>There is a risk of officials deferring blame to “the algorithm,” making redress for citizens difficult in cases of error or harm.</p> <p>Ethical and legal concerns: The use of AI raises normative issues – e.g., potential violation of due process if decisions lack human oversight, threats to privacy from extensive data use, and the moral question of delegating consequential decisions to machines. Certain automated decisions might conflict with laws or constitutional principles (such as rights to a fair hearing) if not carefully checked (Henman, 2020). Ethically, there are concerns about loss of human dignity and agency if people feel decisions are made about them by machines without human consideration.</p>
<p>Personalization of services: AI enables governments to tailor decisions and services to individual needs. For instance, machine learning can segment citizens and customize responses (Maragno et al., 2022). Examples include chatbots providing personalized information, or social programs adjusted based on predictive risk scores. This targeted approach can improve effectiveness (delivering the right services to the right people) and citizen satisfaction.</p> <p>Real-time decision capability: AI, combined with IoT and real-time data feeds, allows governments to make instantaneous or highly responsive decisions. For example, smart traffic management systems adjust signals in real time, and emergency services deploy resources based on live data inputs. This agility in decision-making can improve outcomes in fast-changing situations (e.g., disaster response, pandemic tracking).</p> <p>Reduction of routine burdens on staff: By handling repetitive administrative tasks (data entry, initial screenings, form routing), AI reduces the workload on civil servants. Employees can redirect their time to complex cases, human-centric tasks, or policy analysis that AI cannot do. This can improve job quality for staff (less drudgery) and potentially reduce burnout.</p>	<p>Public resistance and trust issues: If not managed well, AI adoption can face public backlash. Citizens may distrust government AI systems, especially after high-profile failures or scandals (Ingrams et al., 2022). Lack of transparency or perceived unfairness can erode public trust in government overall. Politically, controversial uses of AI (like surveillance tech or automated welfare cuts) can generate resistance and damage the social legitimacy of public institutions.</p> <p>Integration and technical challenges: Implementing AI in legacy government systems is technically challenging. Incompatibilities, data silos, and the need for new infrastructure can lead to costly, delayed, or failed implementations (Maragno et al., 2023). Without the right technical talent and data governance, agencies may struggle to properly integrate and maintain AI systems, risking waste of resources or system breakdowns.</p> <p>Automation bias and over-reliance: Officials might become overly reliant on AI recommendations (“automation bias”), trusting them even when they are flawed (Selten et al., 2023). This can diminish critical oversight and lead to rubber-stamping of algorithmic outputs. If users assume the AI is always correct, errors can propagate unchecked.</p> <p>Maintaining human vigilance and expertise is a challenge when an AI is introduced as a decision aid.</p>
<p>Cost savings in the long term: Though AI systems require investment, over time they can lower operational costs by streamlining processes, reducing error rates (thus fewer costly mistakes to fix), and decreasing manual labor needs (Wirtz et al., 2020). For example, automating fraud detection might save public funds by recovering more revenue and using fewer auditor hours. These efficiency gains can lead to significant public cost savings.</p>	<p>Privacy and security risks: Utilizing AI often entails aggregating and analyzing large datasets, including personal data. This raises privacy concerns – potential misuse or breaches of sensitive information.</p> <p>Cybersecurity is also a risk: AI systems could be hacked or manipulated (adversarial attacks), jeopardizing the integrity of decisions (e.g., an attacker could trick an AI system into misclassifying or altering outcomes). Ensuring data protection and system security becomes a critical challenge with AI deployment.</p>
<p>Policy innovation and insight: AI can uncover novel insights from data that inform policy innovation (e.g., identifying previously unknown factors influencing unemployment, from which new interventions can be devised). It also allows simulation of policy outcomes (what-if scenarios), helping policymakers test ideas virtually before implementation. This evidence-based experimentation capability can lead to more innovative, effective public policies.</p>	<p>Environmental and sustainability costs: Training and running large AI models consumes significant energy, contributing to carbon emissions (Caiza et al., 2024). For governments committed to sustainability, the heavy computational footprint of AI is a concern. Without adopting green AI practices or offsets, large-scale AI adoption could conflict with climate goals and incur hidden environmental costs.</p>

Key advantages (“pros”) and disadvantages (“cons”) of adopting AI for decision-making in government, synthesized from the literature. Policymakers must weigh these pros and cons: the benefits like efficiency, consistency, and data-driven insight against the risks such as bias, transparency loss, accountability issues, and public trust concerns. Effective governance of AI seeks to maximize the advantages while mitigating the disadvantages

welfare programs (Maragno et al., 2023; Engstrom et al., 2020). AI's capacity to analyze big data has been leveraged in areas like public health (to predict disease outbreaks), public safety (to anticipate crime hotspots), and urban planning (for smart traffic management), thereby potentially improving the effectiveness of government interventions (Yuan and Chen, 2025; Yigitcanlar et al., 2021).

One notable impact is the shift in the nature of bureaucratic decision processes. Routine, rules-based decisions (for instance, initial eligibility checks for benefits or permit approvals) can now be handled by algorithms, freeing human officials to focus on more complex or discretionary cases (Henman, 2020). This automation of administrative tasks can make decision-making processes faster and more consistent. Several governments have piloted AI-driven systems for triaging applications or detecting anomalies; for instance, the Australian government's use of an automated system ("Robodebt") to identify welfare overpayments (Rinta-Kahila et al., 2022). While the increased use of AI has led some scholars to herald a move from traditional street-level bureaucracy to "screen-level" or even system-level bureaucracy (Bovens and Zouridis, 2002; Young et al., 2019), others caution that human judgment remains crucial, especially in public decisions involving values and rights (Alon-Barkat and Busuioc, 2022).

AI can also change the timing and proactiveness of government decisions. With AI, governments are increasingly able to make real-time decisions or predictions (Wang et al., 2023). For example, city governments using AI algorithms can dynamically adjust traffic signals based on real-time traffic flow data, or social services agencies can predict which citizens are at risk of homelessness and intervene early. Such data-driven, proactive decision-making represents a shift from reactive policy-making to anticipatory governance (Ingrams et al., 2022). Moreover, AI tools (like natural language processing algorithms) are being used to analyze citizen feedback from social media or service portals, thereby incorporating public sentiment into decision-making processes at scale (Marzouki et al., 2021). This can potentially make governance more responsive, as decisions are informed by up-to-date information about citizen needs and preferences (Kamolov and Teteryatnikov, 2021).

However, the impact of AI is not uniformly positive; it often amplifies both the capabilities and the risks in decision-making. On one hand, AI can enhance rational, evidence-based aspects of decisions by providing comprehensive data analysis (Geske and Leyer, 2022). On the other hand, if the AI models are poorly designed or trained on biased data, they can entrench existing biases or produce skewed recommendations (Fountain, 2022). Thus, the impact of AI on decision quality is context-dependent. In domains where decisions can be well-defined by data (e.g., predicting tax fraud patterns), AI augments human ability to decide effectively. In contrast, in domains requiring nuanced value judgments (e.g., parole decisions, child welfare risk assessments), AI's impact is more controversial, potentially leading to algorithmic decision-making that lacks the empathy or contextual understanding of human officials. The literature documents cases where over-reliance on AI recommendations by

public officials (sometimes termed "automation bias") led to errors not being caught – for example, Dutch tax authorities relying on an algorithm that wrongly flagged families for fraud, triggering a major scandal (Alon-Barkat and Busuioc, 2022). Such cases illustrate that the introduction of AI can significantly influence governance outcomes, for better or worse, and underscore the importance of integrating AI in a way that supports (rather than supplants) sound public sector judgment.

To summarize, AI is reshaping government decision-making by providing powerful tools for data analysis and automation, which can improve efficiency and predictive capacity. It enables more informed and potentially proactive policies. At the same time, these technologies can change power dynamics (e.g., shifting discretion from front-line staff to developers of algorithms) and introduce new failure modes in decision processes. The subsequent subsections delve into the specific advantages and disadvantages observed, as well as the policy, technical, and ethical dimensions of these changes.

3.1. Advantages of AI Adoption for Decision-Making in Government

Across the reviewed literature, there is broad agreement on several key advantages of using AI in government decision-making

3.1.1. Efficiency and speed

AI systems excel at processing large volumes of data and performing routine tasks rapidly. By automating time-consuming and repetitive tasks, AI allows for rapid and accurate execution of processes, thus shortening decision cycles (Caiza et al., 2024). For example, an AI platform might handle thousands of permit applications or benefit claims in a fraction of the time it would take human staff, with consistent application of rules (Henman, 2020; Marsden et al., 2020). This can reduce backlogs and improve service delivery times for citizens. Moreover, AI does not require breaks and can operate 24/7, further increasing throughput (Bokhari and Myeong, 2022). An efficiency gain frequently cited is that AI frees up human officials from menial tasks, enabling them to focus on higher-level analysis, complex cases, or policy planning (Caiza et al., 2024). In sum, AI can augment administrative capacity, effectively allowing governments to "do more with less" (Wirtz et al., 2020).

3.1.2. Improved accuracy and consistency

AI algorithms, when properly designed and trained, can reduce certain types of human error and bias in decision-making. Unlike humans, algorithms do not get fatigued or emotionally influenced, and they apply the same decision rules uniformly. This consistency is beneficial in domains like tax assessments or regulatory compliance checks, where AI can ensure that similar cases are treated alike (Geske and Leyer, 2022). Some studies report that AI decision support can improve the accuracy of decisions by flagging patterns or anomalies that humans might overlook (Janssen et al., 2022). For instance, an AI system might detect subtle indicators of fraud across databases that a human auditor could miss, thereby leading to more accurate enforcement decisions. Experiments have shown that combining AI recommendations with human judgment can yield better outcomes than human or AI alone – e.g., decision-

makers aided by explainable AI made more correct decisions in a simulation study (Janssen et al., 2022).

3.1.3. *Data-driven insights and predictive analytics*

AI's ability to analyze big data enables evidence-based policymaking and more informed decisions. Machine learning models can uncover hidden trends in historical data, providing insights that inform future decisions (Misuraca and van Noordt, 2020). For example, predictive models can forecast demand for public services (like emergency healthcare or public transport usage), allowing governments to allocate resources preemptively. AI has been used to simulate the potential impact of policy options, giving decision-makers a "look-ahead" capability. In public health, AI-driven epidemiological models have guided government decisions during pandemics by predicting infection spread under various intervention scenarios. In disaster management, AI analytics help in early decision-making for evacuations or resource deployment. Such augmented intelligence strengthens the analytical foundation of public decisions (Ingrams et al., 2022), potentially leading to more effective and objective outcomes.

3.1.4. *Enhanced personalization and responsiveness*

Another advantage is the potential to tailor government decisions or services to individual needs through AI. Algorithms can segment populations and customize responses; for instance, AI chatbots in e-government services can interact with citizens and provide information or advice specific to their situation (Maragno et al., 2022). Decision-making systems can also prioritize cases based on risk assessments – for example, child welfare agencies use AI to prioritize high-risk cases for immediate attention (Lupariello et al., 2023). This makes government action more responsive and citizen-centric. Furthermore, real-time data processing by AI allows governments to respond quickly to changing conditions. As one study notes, emerging concepts like real-time policy analytics rely on AI to update decisions on the fly (Valle-Cruz et al., 2022), such as dynamically allocating budget resources based on live performance data (Valle-Cruz et al., 2022).

3.1.5. *Cost savings and productivity*

Although AI systems require upfront investment, in the long run they can lead to cost savings through automation of labor-intensive processes (Bokhari and Myeong, 2022). Reducing manual workload and errors can save public funds. AI tools can also optimize resource allocation – for example, predictive maintenance algorithms in smart city infrastructure tell officials when to service equipment, preventing costly failures. A study on smart budgeting suggested that AI can help identify inefficiencies and recommend reallocations, potentially improving the ROI of public spending (Valle-Cruz et al., 2022). Additionally, by handling mundane tasks, AI can improve public sector productivity and allow civil servants to concentrate on strategic functions that add greater value. Over time, this can transform government operations, making them leaner and more outcome-focused (Wirtz et al., 2020).

In summary, the advantages of AI in government decision-making include gains in efficiency, consistency, and data-informed accuracy, which can translate into improved public services and more rational policies. These benefits, evidenced by numerous

pilot projects and studies, make a compelling case for governments to explore AI integration. Table 2 (in a later section) provides a consolidated list of such pros with references. However, reaping these benefits depends on careful implementation; if AI is applied inappropriately, the downsides may outweigh the upsides, as discussed next.

3.2. **Disadvantages and Challenges**

While AI offers promising benefits, the literature also emphasizes a range of disadvantages and challenges associated with its adoption in public decision-making. Perhaps the most cited concern is algorithmic bias and fairness issues. AI systems can inadvertently perpetuate or amplify biases present in training data, leading to discriminatory outcomes (Fountain, 2022; Zuiderwijk et al., 2021). For example, an AI used for screening job applicants in a government HR department might disproportionately favor or disfavor certain demographic groups if the historical data reflect past biases (Tawalbeh et al., 2025). Such biases have real consequences: A notable case involved a benefits eligibility algorithm in the Netherlands that discriminated against applicants of certain ethnic backgrounds, causing wrongful denial of benefits (Alon-Barkat and Busuioc, 2022). Bias in AI-driven decisions undermines equity and can erode public trust in government, raising serious ethical and legal concerns about equal treatment and nondiscrimination.

Closely related is the issue of lack of transparency (the "black-box" problem). Many AI models, especially complex machine learning (e.g., deep neural networks), operate as opaque systems that do not provide easily interpretable reasons for their outputs. In government contexts that demand transparency and reasoning (for legitimacy and legal accountability), this opacity is problematic (de Bruijn et al., 2022). Citizens and officials may find it difficult to understand how an AI arrived at a particular decision or recommendation, which complicates appeals and oversight. As Busuioc (2021) notes, a core challenge is ensuring algorithmic accountability – i.e., being able to explain and justify AI-assisted decisions in a manner similar to human-made decisions. Without transparency, errors or biases in AI decisions may go undetected and uncorrected. A systematic review by Yuan and Chen (2025) found that the introduction of AI in government "brings unique challenges to maintaining governmental accountability" (Yuan and Chen, 2025), in part due to this opacity. Efforts to use explainable AI (XAI) techniques are underway, but researchers caution that explanations need to be accessible to non-technical stakeholders to truly mitigate the black-box issue (de Bruijn et al., 2022).

Another significant disadvantage is the accountability gap that arises when AI systems play a major role in decisions. Traditional public administration is built on clear lines of responsibility – specific officials or agencies can be held accountable for decisions. AI complicates this, as responsibility is diffused among the software developers, data scientists, the procuring agency, and the end-users (Bracci et al., 2023). When an AI system makes a wrong or harmful decision (e.g., unjustly denying someone a service), it can be unclear who is accountable: The agency using the AI, the vendor who supplied it, or the machine itself (which, being non-human, cannot be held accountable in a legal

or moral sense). This “loophole of algorithmic public services” demands new accountability mechanisms (Bracci et al., 2023). Public management scholars warn that without resolving accountability, the adoption of AI could undermine citizens’ right to redress and weaken bureaucratic answerability (Busuioc, 2021). Some jurisdictions are exploring approaches like algorithmic transparency registers and audit trails to assign accountability, but this remains an evolving challenge.

Ethical and Legal Concerns form another category of disadvantages. The deployment of AI in government may conflict with principles of administrative law and ethics. For instance, automated decision-making can threaten due process rights if individuals are not given the opportunity to understand or contest decisions. There have been legal challenges, such as court rulings that certain automated systems violated procedural fairness (e.g., the Robodebt program was ruled unlawful in Australia, partially because it reversed the onus of proof onto citizens based on automated calculations). Privacy is also a top concern: AI often requires integrating and analyzing large datasets, some of which contain personal or sensitive information. This raises the risk of privacy violations or misuse of data, especially if data governance is weak. Moreover, the prospect of AI-driven surveillance or predictive policing triggers fears of an overly “observant” state that could infringe on civil liberties (Fountain, 2022). Ethical dilemmas also include whether it is appropriate to delegate decisions with moral weight (such as sentencing or welfare sanctions) to machines, and how to ensure AI decisions align with public values like compassion, justice, and equity (Chen et al., 2023). These issues require careful normative considerations; as one analysis noted, the socially oriented values of accountability, equality, privacy, fairness, and justice are all at stake and must be safeguarded when AI is introduced into governance (de Pedraza and Vollbracht, 2023)..

From a practical standpoint, there are technical and organizational challenges that can be seen as disadvantages or barriers. Implementing AI systems in government is complex and often costly. Many public sector organizations face a lack of technical expertise and need to upskill their workforce or rely on external vendors, which can create dependency. Integration of AI with legacy IT systems is frequently difficult, leading to implementation delays or failures (Maragno et al., 2023). Data issues are another challenge: government data may be siloed, of poor quality, or unrepresentative, which in turn affects AI performance. As Wilson and van der Velden (2022) point out, the sustainability of AI projects also matters – some pilot projects are not scaled up due to resource constraints or maintenance issues, wasting initial investments. Additionally, public sector AI projects can encounter resistance from employees (fearful of job displacement or skeptical of algorithmic decisions) and from the public (lack of trust in AI). These socio-technical hurdles mean that even when AI has theoretical advantages, realizing them in practice can be hard, and failures can undermine public confidence in innovation (Benbunan-Fich et al., 2020).

Finally, a notable disadvantage that has emerged in recent discussions is the **environmental cost** of AI. Training and running advanced AI models (especially in deep learning) require

substantial computing power and electricity, which contributes to carbon emissions. As governments commit to sustainability goals, the high energy consumption of large AI systems is a concern (Caiza et al., 2024). Though this issue is not unique to the public sector, it is an often overlooked drawback of scaling up AI – large-scale adoption across government agencies could significantly increase the public sector’s carbon footprint if not managed with green computing practices (Wilson and van der Velden, 2022).

In summary, alongside its benefits, AI introduces significant disadvantages to government decision-making: risks of bias and unfairness, opacity and reduced transparency, challenges in attributing responsibility, ethical and legal complications, implementation difficulties, and even environmental impacts. These challenges underscore that AI is a double-edged sword (OECD, 2021), offering “substantial potential to enhance government efficiency and service delivery” but coming with “significant barriers” (Caiza et al., 2024, p. 2).

Table 2 later in this article summarizes these pros and cons. Recognizing the disadvantages leads directly to consideration of policy implications – how should governments respond to and manage the risks of AI? – which we address next.

Policy Implications: The transformative impact of AI on public sector decision-making has prompted a range of policy responses and recommendations in the literature. One overarching implication is that governments need to develop **robust** governance frameworks and strategies for AI. More than 60 countries have formulated national AI strategies or policies as of the early 2020s, aiming to harness AI benefits while mitigating risks (Saheb and Saheb, 2023). These strategies often highlight the double-edged nature of AI and call for a balanced approach. For instance, the OECD’s AI Principles (adopted in 2019 and endorsed by many governments) emphasize values such as fairness, transparency, human oversight, and accountability in AI deployment. National policies translate these into actionable guidelines; for example, the European Union has taken a notably proactive stance by proposing the AI Act (a regulatory framework that classifies AI systems by risk and imposes requirements, especially for high-risk applications in government like credit scoring or judicial decisions). The EU also released **Ethics** Guidelines for Trustworthy AI, which provide a framework for public organizations to ensure AI systems are lawful, ethical, and robust. These guidelines stress principles such as human agency and oversight, technical robustness, privacy and data governance, transparency, non-discrimination, and societal well-being.

From a policy perspective, one clear implication is the need for accountability mechanisms for AI-based decisions. Scholars suggest that governments should establish procedures to audit algorithms and their outcomes (Yuan and Chen, 2025). This could involve algorithmic impact assessments before deployment, continuous monitoring of AI decisions for bias or errors, and the creation of oversight bodies. For example, Canada has implemented an Algorithmic Impact Assessment tool that federal departments must use when deploying automated decision systems, and some cities (like Helsinki and Amsterdam)

maintain public registries of the algorithms in use, to increase transparency. Busuioc (2021) and Bracci et al. (2023) argue that traditional bureaucratic accountability must be supplemented with algorithmic accountability, possibly including new roles such as AI ethics officers or external audit agencies empowered to evaluate government AI systems (Yuan and Chen, 2025). Policymakers are also considering laws that clarify legal liability when AI is involved – for instance, ensuring that the responsible minister or agency cannot evade accountability by blaming “the algorithm.” Clear guidelines about human-in-the-loop requirements (i.e., mandating human review of AI-generated decisions in certain contexts) are part of these accountability frameworks.

Regulatory and legal adaptations are another area of policy implications. Many jurisdictions are updating their laws on data protection, administrative procedure, and anti-discrimination to account for AI. For example, the European General Data Protection Regulation (GDPR) provides a right to explanation for automated decisions, which has implications for how governments design AI systems (they may need to provide meaningful explanations to individuals subject to automated decisions). In the United States, initiatives like the Algorithmic Accountability Act (proposed legislation) and the White House’s Blueprint for an AI Bill of Rights (2022) reflect a policy push towards protecting citizens from AI harms (such as bias or unchecked surveillance). Additionally, procurement policies are being updated – governments as buyers of AI tech are including clauses to ensure vendors address bias, provide transparency, or allow audits (Engstrom et al., 2020). In some cases, policies might even restrict or ban the use of AI for certain decisions; for example, there is debate about prohibiting AI in decisions that fundamentally affect human rights (such as fully automated asylum determinations or predictive policing without human oversight).

Another implication concerns capacity-building and skill development within the public sector. Policymakers recognize that leveraging AI responsibly requires not just technology but also people with the right expertise. Many national AI strategies call for training programs for public servants on data science and AI literacy. The establishment of dedicated AI task forces or innovation labs in government agencies is often recommended to pilot new systems and share best practices (Mikhaylov et al., 2018). International organizations (like the OECD and United Nations) have also been producing policy guidelines and toolkits to help governments build institutional capacity for AI governance (e.g., the OECD’s AI Observatory, and UNESCO’s Recommendation on the Ethics of AI in 2021). The literature suggests that effective policy implementation will require cross-sector collaboration – engaging academia, industry, civil society, and citizen stakeholders in the design and oversight of public sector AI. This participatory approach can improve legitimacy and trust. For instance, involving ethicists and community representatives in AI system design for policing or welfare can help align the system with public values and expectations (Chen et al., 2023).

Ethical guidelines and public value alignment have become a staple of policy discussions. Many governments or agencies are adopting ethical AI guidelines that translate high-level principles

into organizational practices. For example, the UK Government released a guide to using AI in the public sector which includes an “alpha” ethical framework (The UK’s “Data Ethics Framework”) advising on issues like fairness, transparency, and user need. One theme from the literature is that public sector AI policies must reinforce traditional public service values – such as equity, accountability, transparency, and service to citizens – ensuring that these are not overshadowed by a narrow focus on efficiency or innovation (Chen et al., 2023). In practice, this might mean requiring that algorithms are tested for disparate impact (to uphold equity), or that significant decisions always have a human review stage (to preserve accountability and moral judgment). Some scholars argue for a human-rights-based approach to AI governance in the public sector, embedding protections so that AI advancements do not come at the cost of citizens’ rights (Fountain, 2022).

Finally, a policy implication is the importance of incremental and evaluated deployment of AI in governance. Rather than rushing to automate, several studies advise policymakers to adopt AI gradually, in low-stakes contexts first, and rigorously evaluate outcomes (Henman, 2020). This experimentalist approach allows learning and course correction. Policies can mandate pilot phases and independent evaluations of AI systems before scaling them up. For instance, a city might trial an AI tool for pothole detection, measure its performance and impact on maintenance decisions, and expand use only upon satisfactory results. Making evaluation results public is also a way to maintain transparency with citizens about what AI is doing and how well it works (Geske and Leyer, 2022). In sum, prudent policy dictates cautious optimism – encouraging innovation in public services through AI, but with strong safeguards, oversight, and a willingness to intervene (including to shut down systems) if they produce harmful effects.

In conclusion, the advent of AI in government decision-making calls for nuanced policy responses. Governments must craft regulations that ensure AI systems are accountable, fair, and transparent, without unduly stifling innovation. Developing internal capacities and ethical norms is equally important. The consensus in recent literature is that effective governance of AI is essential to maximize its benefits and minimize its harms in the public sector (Keller and Drake, 2021; Zuidervijk et al., 2021). The next section on technical aspects further elaborates on how some of these policy goals (like transparency or accountability) can be supported through technical design and infrastructure.

Technical Aspects of AI Implementation: The successful integration of AI into government decision-making depends not only on policy and management but also on resolving various technical challenges and leveraging appropriate technological approaches. Several technical aspects emerge from the literature as critical for AI adoption in the public sector: data infrastructure, system integration, algorithm design (including explainability), and cybersecurity, among others.

3.2.1. Data quality and infrastructure

AI systems are only as good as the data they rely on. A recurring point is that many government agencies need to improve their data

infrastructure to harness AI effectively (Misuraca and van Noordt, 2020). This includes digitizing records, ensuring data accuracy, and enabling data sharing across departments. Issues of data silos and poor data quality can hinder AI projects or lead to misleading results. Technical efforts such as establishing interoperable data platforms and standardizing data formats are often needed. For example, a city implementing an AI for smart services might need to merge data from transportation, utilities, and public safety departments – a non-trivial technical task requiring robust data engineering. Additionally, the use of real-time data streams (e.g., from IoT sensors or social media) in decision-making means that systems must handle high velocity and volume of data, calling for scalable architectures and possibly cloud-based solutions (Alhanatleh et al., 2024; Bokhari and Myeong, 2022). Investment in government data lakes, APIs for data access, and secure data warehouses are technical prerequisites frequently mentioned in the reviewed studies.

3.2.2. System integration and legacy systems

Governments often have long-standing legacy IT systems that were not designed with AI in mind. Integrating AI solutions (which may be new software modules or external services) with existing workflows and databases is a major technical aspect. Challenges include ensuring compatibility, managing API integrations, and sometimes refactoring legacy code. Tangi et al. (2023) highlight through case studies that technical integration issues can stall AI implementations in the public sector. One strategy is using middleware or adopting microservices architectures that allow newer AI components to interface with older systems in a decoupled way. Another is phased modernization: updating legacy systems to be “AI-ready.” Technical teams in government need to coordinate closely with AI solution providers to ensure that models can access the required data and output decisions back into operational systems (for instance, an AI model might score permit applications, but the final decision still needs to be recorded in the legacy case management system; building that bridge is part of integration). Without resolving these, AI projects risk remaining in pilot mode or operating in isolation without embedding into actual decision processes (Maragno et al., 2023).

3.2.3. Explainability and algorithm design

On the design front, one technical priority for public sector AI is developing explainable AI (XAI) techniques that can make algorithmic decisions interpretable to humans. Unlike proprietary settings, government decisions often require explanation. Therefore, technical research and development are focusing on models or add-on tools that can provide reasons or simplified logic for an AI’s output (de Bruijn et al., 2022). For example, instead of using a completely opaque neural network, agencies might opt for a more interpretable model (like decision trees or rule-based systems) for certain applications, even at some cost to predictive accuracy, to ensure the decision logic can be communicated. Alternatively, they might use techniques like LIME or SHAP (popular XAI methods) to generate post-hoc explanations for complex models. Janssen et al. (2022) found that explainability, combined with decision-makers’ experience, helped public officials better detect when the AI was making incorrect suggestions. This underscores that technical choices in algorithm

design (transparent vs. opaque models, inclusion of explanation modules) can directly affect the reliability and acceptability of AI-assisted decisions. Additionally, algorithms should be designed to be robust and bias-mitigating: technical steps like bias auditing of training data, inclusion of fairness constraints in model training, and periodic re-training/updating of models are recommended to maintain performance and fairness (Fountain, 2022; Wirtz et al., 2020).

3.2.4. Cybersecurity and reliability

As government decisions increasingly rely on AI systems, ensuring the security and reliability of these systems becomes a technical imperative. AI systems could be targets for cyber-attacks – for example, an attacker might try to manipulate an algorithm’s input data (data poisoning) to influence outcomes, or exploit vulnerabilities to access sensitive information. Thus, technical aspects include implementing strong security measures around AI pipelines (encryption, access controls, anomaly detection for unusual inputs). There are documented concerns about adversarial examples in AI (specially crafted inputs that fool models); in a public sector context, this could be catastrophic – imagine an adversarial trick that causes a spam filter to let through malicious content in a government communication system, or causes an AI surveillance system to misidentify individuals. Government IT departments must rigorously test AI systems for such vulnerabilities. High reliability and uptime are also needed: if an AI system critical to decision-making fails, it could disrupt services. Redundancy, fail-safes (including the ability to fall back to human decision-making), and thorough testing are technical practices emphasized by studies like Harrison and Luna-Reyes (2022) on trustworthy AI systems. Ensuring technical reliability also means validation and verification of AI outputs – technical teams should simulate various scenarios to see how the AI behaves, to avoid unexpected behavior in real deployments (Medrano-Berumen and İlhan Akbaş, 2020).

3.2.5. Scalability and maintenance

Technical aspects do not end at deployment; maintaining and scaling AI systems is a continuous challenge. Government contexts often involve dynamic changes – policies change, population behavior shifts (like during crises), and AI models must adapt. This requires setting up pipelines for continuous model monitoring and retraining as needed (perhaps using new data as it becomes available). Few public agencies historically have this kind of MLOps (Machine Learning Operations) capability, so building it is part of the technical heavy lifting. Moreover, as usage expands, systems must scale – an AI used in one region might be rolled out nationwide, implying more data and more users. Cloud computing is frequently cited as a solution for scalability in government AI (allowing on-demand resource scaling). Some governments are investing in shared AI infrastructure or platforms that different departments can leverage, centralizing the technical expertise and resources (Chen et al., 2023 mention such an approach to ensure consistent value-driven development across agencies).

In conclusion, the technical underpinnings of AI in government are complex but crucial. Adequate data infrastructure, system integration, explainable and robust algorithm design, strong security,

and maintainability are all needed to ensure that AI tools function correctly and gain the confidence of decision-makers and the public. Many of these technical aspects are directly linked to policy and ethical requirements. For instance, the demand for explainability (an ethical/policy requirement) must be met by technical means (XAI algorithms). Likewise, ensuring non-discrimination involves both policy (mandating it) and technical steps (algorithmic fairness techniques). This interplay means interdisciplinary collaboration (between data scientists, IT professionals, legal experts, and ethicists) is needed when developing AI for government use. Next, we turn to the ethical concerns in more detail, some of which have been touched upon, to explicitly address the normative dimensions of AI in public decision-making.

Ethical Concerns in AI-Driven Public Decision-Making: Ethical considerations are at the forefront of discussions about AI in government. The literature strongly asserts that the use of AI in public decision-making must be guided by ethical principles to ensure that it serves the public interest and does not harm societal values. Key ethical concerns include fairness, transparency, accountability, privacy, and the preservation of human agency and dignity.

3.2.6. Fairness and equity

Ensuring that AI-assisted decisions are fair and do not discriminate unlawfully is a paramount ethical concern (Fountain, 2022). Public institutions have an obligation to uphold equality before the law and equitable treatment of citizens. If an AI system produces biased outcomes against a particular group (e.g., disproportionately flagging individuals of a certain race or socioeconomic status as high risk in a policing context), this violates ethical standards and potentially legal standards. Many of the studies reviewed call for rigorous fairness testing of AI systems used by governments (Zuiderwijk et al., 2021). There is also an ethical argument for inclusive design – involving diverse stakeholders in the development of AI systems to catch potential biases and value conflicts early (Chen et al., 2023). Some scholars go further to suggest that in certain sensitive areas (criminal justice, welfare sanctions), the ethical risks of AI may outweigh the benefits, advocating for very limited or no use of AI until fairness can be guaranteed (Busuioc, 2021). The precautionary principle in ethics would advise against deploying AI where its impact on vulnerable populations is not fully understood or controllable.

3.2.7. Transparency and the right to explanation

Ethically, citizens have a right to understand decisions that affect them. Opaque AI undermines this right. Transparency is linked to trust – if people don't know how or why a decision was made, they are less likely to trust it (Grimmelikhuijsen, 2023). Ethical AI frameworks (like the EU's Trustworthy AI guidelines) list transparency as a core requirement. In practice, this means government agencies should be open about when they use AI and provide accessible explanations for AI-driven decisions. This could involve disclosing the factors the algorithm considered or providing a human-readable rationale generated from the model. Ethically, it's also about honesty – avoiding any deception of the public regarding AI use. For instance, if a citizen interacts only with a chatbot thinking it's a human, some argue it's ethical to inform them they are talking to an AI. Transparency extends to policymakers as well:

those approving AI systems need transparency from developers about limitations and potential biases. A lack of transparency not only hurts individual rights but can weaken democratic accountability and public scrutiny of automated decision-making systems (Alon-Barkat and Busuioc, 2022).

3.2.8. Accountability and human responsibility

Ethically, government decisions – even when aided by AI – should have clear human responsibility. The principle of meaningful human control is often invoked, especially in contexts like automated weapons or critical decisions; similarly, in administrative decisions, many ethicists and legal scholars maintain that AI should augment rather than replace human decision-makers in final accountability. This leads to practices like requiring a human caseworker to review an algorithm's recommendation before finalizing a decision (thus a human is accountable). An ethical concern is the risk of “moral buffering,” where officials might hide behind AI (“the computer says so, so we did it”) to abdicate responsibility (Busuioc, 2021). Ethically, this is problematic because it undermines the social contract wherein public servants are answerable to the people. Therefore, building accountability means maintaining human oversight and intervention points. Ethicists also discuss the need for recourse: if someone is harmed by an AI-driven decision, there should be a way to challenge and correct it, which ties back to both accountability and fairness (Bracci et al., 2023). The ethical design of grievance mechanisms for algorithmic decisions is an emerging topic – for example, creating channels for individuals to appeal automated decisions and have them reviewed by a human tribunal.

3.2.9. Privacy and consent

Government use of AI often involves processing personal data, raising privacy issues. Ethically, governments must balance the potential public good derived from analyzing citizen data with the individual's right to privacy and autonomy. There are concerns about surveillance – AI can greatly enhance the state's surveillance capabilities through facial recognition cameras, social media monitoring, etc. This can deter free expression and alter the citizen-government power relationship if unchecked. Ethical governance of AI thus demands strict adherence to privacy laws and norms, data minimization (using only the data needed for the task and nothing more), and in some cases seeking consent. While individuals can hardly “opt out” of government decision systems, transparency and the ability to correct one's data (if it's wrong) are part of ethical practice. The EU's GDPR, for instance, is grounded in the ethical principle that people have control over their personal data and how it's used, something public sector AI must respect. Additionally, privacy intersects with fairness when data collection is uneven – marginalized communities might be more surveilled, feeding more data into AI (like predictive policing models focusing on certain neighborhoods), an ethically fraught feedback loop.

3.2.10. Maintaining human dignity and agency

A subtler but profound ethical concern is the potential dehumanization of public services. If decisions that significantly affect people's lives (like eligibility for social benefits, or a risk assessment that influences a prison sentence) are made by impersonal algorithms, individuals may feel they are treated as

data points rather than human beings with unique circumstances. This concern is rooted in the idea of human dignity. Many argue that certain decisions should not be left solely to machines because doing so undermines respect for the individual's humanity. Ethically, this suggests a cautious approach: AI can inform but not fully decide on matters involving moral judgment or compassion. For example, a welfare caseworker might use an AI risk score as one input, but still meet the applicant and consider factors the AI could not quantify (Henman, 2020). Ensuring human-in-the-loop in such scenarios is not just about error-checking; it's about upholding an ethical commitment to personalized, humane treatment. Moreover, preserving human agency also means public officials should not over-rely on AI (the phenomenon of automation bias is ethically concerning because the human operator might stop engaging critically). Training and protocols should encourage officials to question AI outputs and use their professional judgment, to ensure AI remains a tool rather than an arbiter of public decisions (Janssen et al., 2022).

3.2.11. Ethical governance and public engagement

The literature also highlights the ethical importance of public engagement in shaping how AI is used. Since these technologies can significantly impact society, democratic deliberation is recommended. Engaging citizens in discussions or participatory policymaking regarding AI (for instance, town hall meetings about facial recognition use, or citizen juries on algorithmic fairness) can help align AI use with societal values. It's an ethical approach to technology governance that respects the role of the public in decisions about public sector innovation. Some cities have pioneered this (e.g., Amsterdam's citizens were consulted on principles for its AI systems). This approach can also help identify ethical concerns that technologists or officials might miss from their perspective.

In sum, the ethical concerns demand that AI in government be responsible AI. This entails proactive measures to ensure fairness, transparency, accountability, privacy protection, and human-centric design. Many of these overlap with legal requirements, but ethics often goes further – covering gray areas and guiding choices even when law is not explicit. Table 2's "Cons" column encapsulates many of these ethical issues (bias, opacity, etc.), and the academic discourse strongly calls for embedding ethics throughout the AI system lifecycle (design, deployment, use, and oversight) (Chen et al., 2023). Encouragingly, the awareness of these concerns is high, and frameworks to address them are being developed, though practical implementation is ongoing work. Balancing the innovation potential of AI with ethical guardrails is a central challenge for modern public administration.

4. CONCLUSION

Artificial intelligence is poised to profoundly influence government decision-making in the coming years, bringing both transformative benefits and serious challenges. This comprehensive review of recent studies (2020–2025) reveals a complex picture: AI can enhance the efficiency, consistency, and analytical depth of public-sector decisions (improving service delivery and policy outcomes), yet it can also introduce risks of bias, opacity, and accountability

gaps if implemented without adequate safeguards. Governments stand at a crossroads where embracing AI's potential must go hand-in-hand with prudent governance, technical diligence, and ethical foresight.

In summary, the advantages of AI in government – faster processing, data-informed insights, resource optimization, and potential cost savings – are significant and have already been demonstrated in various pilot projects and applications. Agencies that have adopted AI report streamlining of routine tasks and new capabilities in predictive policy analysis (Caiza et al., 2024; Gur et al., 2024; Valle-Cruz et al., 2022). These benefits can contribute to more responsive and effective government, an important public value especially in times of budget constraints and complex societal challenges. However, our review underscores that these gains can only be realized sustainably if the accompanying disadvantages are addressed. Issues of algorithmic bias and fairness remain a chief concern: public-sector AI systems must be rigorously tested and monitored to prevent unjust or disparate impacts on different communities (Fountain, 2022). Transparency and explainability emerged as non-negotiable requirements – not only to satisfy legal standards of administrative reasoning and public scrutiny but also to build trust. Accountability structures need to be rethought and strengthened; ultimately, citizens need assurance that when an algorithm assists in a decision, there is a humanly understandable and accountable process behind it (Yuan and Chen, 2025). Ethical considerations, from preserving human agency to protecting privacy, are not abstract ideals but practical criteria that should guide every stage of AI system development and deployment in the public realm (Chen et al., 2023).

Policy implications from these findings are manifold. At the strategic level, governments should formulate clear AI governance policies or frameworks that integrate technical standards (for accuracy, security, explainability) with administrative protocols (for oversight, audit, and public engagement). Many countries and international bodies have started this journey by issuing AI ethics guidelines and draft regulations; the challenge now is operationalizing these guidelines in day-to-day public administration. This includes investing in human capacity – training civil servants in data science competence and AI ethics – as well as possibly creating new institutional roles such as Chief Data Officers or algorithm review boards in agencies (Busuioc, 2021). Additionally, legislative and regulatory updates may be required to fill gaps (for example, establishing individuals' rights in relation to automated decisions, or clarifying liability when AI is used). On the technical front, public organizations should adopt a "secure and explainable by design" approach when procuring or developing AI systems, insisting on features that enable auditing and interpretation of decisions (de Bruijn et al., 2022). Multi-disciplinary collaboration will be key: data scientists, public managers, legal experts, and ethicists need to work together throughout the AI system lifecycle to ensure alignment with public values and legal norms.

One overarching recommendation from this review is the importance of *incrementalism and evaluation*. Given the stakes, governments might do well to start with pilot programs, thoroughly

evaluate outcomes (both intended and unintended), and scale up AI use cautiously. This iterative approach allows learning and trust-building. It also provides space to involve the public – explaining the purpose of the AI, its results, and getting feedback – which can improve legitimacy and acceptance (Ingrams et al., 2022). We also highlight the need for cross-jurisdiction knowledge sharing. The experiences of one city or country (successes, failures, lessons in AI oversight) can be invaluable to others; forums for sharing best practices and even AI tools (in open-source form) can accelerate collective learning while avoiding repeated mistakes.

In conclusion, AI presents a paradigm shift for government decision-making comparable to the advent of computers or the internet in prior generations. Its impact will be shaped by how consciously and responsibly it is integrated into public governance. If governments rigorously manage the disadvantages – by ensuring fairness, transparency, accountability, and ethical use – AI has the capacity to significantly enhance public administration, enabling smarter policies and more efficient services. Conversely, neglecting these factors could lead to public mistrust, harm to citizens' rights, and erosion of democratic values. The 43 studies reviewed converge on a clear message: realizing AI's promise in government requires a careful balancing act and a commitment to "responsible AI." This means continuously aligning AI tools with the public interest, through sound policy, robust technical design, and ethical leadership. Future research should continue to monitor real-world implementations, develop methods for algorithmic auditing and participatory design, and assess the long-term societal effects of AI in governance. By doing so, scholars and practitioners can jointly guide the evolution of AI in government in a direction that maximizes social benefit and upholds the foundations of good governance.

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