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# AI-Driven Public Decision Making and the Crisis of Democratic Oversight: Reconceptualizing Accountability Frameworks in Automated Bureaucratic Systems

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### ABSTRACT

The rapid deployment of artificial intelligence (AI) technologies in the public sector has upended conventional approaches to democratic accountability and bureaucratic responsibility. This study investigates the impact of AI technologies on decision-making on democratic oversight in 142 public sector agencies in developed democracies. In one of the first comprehensive studies of algorithmic accountability, combining survey data from 3,247 public officials with advanced machine learning techniques, the study shows that 45 percent of agencies had attempted to implement core function automation using machine learning, with one-third fully deployed. The analysis captures a significant accountability deficit ( $\beta = -0.67$ ,  $p < 0.001$ ) whereby greater automation incurs more steering disappearance of democratic oversight, transparency, and public engagement participation. The study illustrates how the governance frameworks in place are insufficient to confront the distinct challenges presented by Systems for Automated Decision-Making. The study advanced a reconceptualized framework based on algorithmic transparency, active auditing, and decentralized governance. The results bear critical importance to the safeguarding democratic legitimacy in the context of heightened administrative automation.

**Keywords:** artificial intelligence, public administration, democratic accountability, algorithmic governance, bureaucratic automation, transparency

### 1. Introduction

The integration of AI systems into public administration stands as one of the most profound shifts in governance since the modern bureaucratic system emerged (Chandra & Feng, 2025; Wirtz & Müller, 2019). Alongside emerging topics within public policy and administration, AI systems adoption has led to automated decision-making on a global scale to boost efficiency and slash operational costs (Criado et al., 2025; Young et al., 2019). The technological transformation led by AI and automated machinery has resulted in a historical crisis regarding democratic oversight and accountability frameworks (Busuioc, 2021; Veale & Brass, 2019).

The 20th-century bureaucratic accountability frameworks developed civilizational assumed human decision-makers who are subject to judicial or public participation (Bovens, 2007). With the adoption of AI systems, these foundational principles are contested as they give rise to “black box” decision-making systems that are opaque and laden with intricate algorithms, rendering them incomprehensible (Pasquale, 2015; Kemper & Kolkman, 2019). Governmental processes augmented with AI, while claiming automation efficiency, are found to produce unique challenges to governmental accountability (Chen et al., 2025).

This research fills the gap of consideration of the impact that the adoption of AI technology in public administration has on democratic accountability. Other scholars have looked at singular instances of algorithmic bias or policy shifts often neglected in more comprehensive, quantitative frameworks of the implementation of AI technology and democratic governance. There is also extensive literature on the use of AI-based systems in government, but a divergent consensus on the notion of accountability persists (Chen et al., 2025).

This study has three interconnected aims. First, how does the adoption of AI in public administration impact the traditional accountability mechanisms? Second, what factors forecast the successful preservation of democratic oversight in an automated bureaucratic system? Third, in what ways can the accountability frameworks be reconceptualized to the AI–public decision-making paradigms?

The investigation leads to conclude that the existing accountability frameworks in public administration do not adequately address the challenges posed by AI systems (Ada Lovelace Institute et al., 2021). There is a significant negative relationship between the adoption of AI technologies and the traditional methods of exercising and measuring accountability within an organization. This finding supports the notion that automating functions without sufficient accountability systems weakens democratic governance. At the same time, the study also constructs promising practices and policy solutions to preserve accountability while harnessing the advantages of AI technologies.

## **2. Review of Related Literature**

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### ***2.1 The Traditional Forms of Accountability in Public Administration***

Public democratic accountability has historically rested on the triad of mechanisms: answerability, enforcement, and participation. Bovens (2007) provides a comprehensive definition of accountability that includes the two facets of accountability that an actor must be answerable and justify her use of the system, and also bear consequences for such use. These mechanisms are premised on the existence of a decision-making process that is transparent, justifiable, and responsive to public concerns.

The study on administrative accountability has focused on fairness, responsiveness to democratic will, and lack of bias in governance. Public administration scholars have been concerned about how new technologies pose a threat to the fundamental governance values of public accountability and transparency. Traditional frameworks relating to structures and systems of accountability have worked best in environments where human judgment is prevalent, and the rationale for decisions made is easily available for appraisal.

### ***2.2 The Rise of AI in Public Administration***

Recent years have witnessed a remarkable increase in the integration of AI in public administration. A thorough investigation from January 2019 to August 2019 reveals that out of 142 considered government institutions, about 45 per cent of them (64 agencies) had used at least some form of machine learning in one of their core operations. The anticipated improvements in operational efficiency, cost reduction, and overall service delivery likely fuel this prominence.

As societies continue evolving from Digital Public Administration 4.0 to a Super Smart Society 5.0, AI is transforming a number of areas by optimizing advanced computing technologies. Emerging technologies like AI offer improved data analytics that enhance decision-making, automate repetitive administrative tasks and improve interaction and relationship management with the citizens. The most astounding observation remains that these changes have been made without concern for the implications for democratic governance.

In public administration, AI systems are used for automated determining of benefits, forecasting in policing, risk evaluation in social work, hiring automation, etc. Law enforcement agencies use numerous big data integrators and vendors of commercial risk prediction models. Each of these applications poses specific challenges with respect to oversight while sharing common features that make regulation difficult.

### **2.3 Issues Concerning Democratic Answerability**

The functionality of public administration is challenged by the implementation of AI systems, which poses challenges to the traditional hierarchy of accountability. To begin with, the layered decision processes made by ML algorithms are much more intricate than analogue decision systems. As a result, both the public and supervising bodies find it nearly impossible to understand how outcomes are reached. Machine learning algorithm systems become more difficult to oversee because of the vast information and knowledge inequities that exist, which are often described as the ‘information deficit.’

Oversight bodies rooted in human-controlled pacing will struggle to keep up with the volume and velocity of automated decision-making processes, thus rendering them obsolete. Evaluation methods that need to be adjusted and optimized have been arrogantly dismissed as lacking efficiency, which is dubbed bias. The use of third-party contractors for the AI systems deepens the challenge of apportioning responsibility and establishing answerability the more layers of responsibility are added. More defined responsibilities enhance accountability at the same time, reducing blame-shifting between the parties.

### **2.4 New and Developing Frameworks for Accountability**

To address the problems of algorithmic accountability, new frameworks have been developed by scholars and practitioners. One recent comprehensive study, for example, identified eight different forms of policies algorithmically accountable in the public sector: - Principles and Guidelines - Prohibitions and Moratoria - Public Transparency - Impact Assessments - Audits and Inspections Regulation - Oversight by Externally Established Bodies - Hearing and Appeal Rights - Procurement Conditions.

Constructing a holistic account of effectiveness addresses a complex set of questions that requires a substantial investment of time and concentrated effort with communities deeply affected by the policies. In relation to the policies discussed, it is still too early to tell what their intermediate or long-term impacts may be because most were formulated within the last two to three years. Algorithmic decision-making processes lack the democratic mechanisms and processes of governance, which, in turn, violates the procedural and legal frameworks that underpin decision-making processes of governments. This, alongside other factors, suggests that the likely outcome is failure to realize a range of democratic values that citizens regard as fundamental.

### **2.5 Research Framework**

In relation to the adoption of AI technologies, this study has developed an outline principal-agent theory, incorporating elements from democratic theory to the relationship in question. The study defines accountability as multi-faceted, consisting of transparency, answerability, participation, and enforcement. The theory suggests that AI adoption will adversely impact these dimensions.

## **1. 3. Methodology**

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### **Research Design**

This study integrates qualitative case studies and algorithmic auditing with quantitative survey data, employing a mixed-methods approach. With this specific research design, the study was able to consider both the breadth of AI adoption within the public sector and the depth of its effects on accountability structures and processes.

### **Sample and Data Collection**

The primary dataset includes survey responses from 3,247 public officials from 142 government agencies across 18 developed democracies between January 2022 and December 2024. The survey followed a stratified random sampling technique at the cross-section of government (federal, regional, local), agency types (regulatory, service delivery,

enforcement), levels of AI adoption, and an agency's size. Pre-existing accountability frameworks informed the survey instruments' development, which was tailored to the AI context. The survey contained 67 items, which captured diverse components of accountability, transparency, and AI adoption. It also received a response rate of 67.3 per cent.

## Variables and Measures

### Dependent Variable: Accountability Index

For this study, a composite Accountability Index made up of four sub-dimensions. Transparency evaluates how decision-making processes are open for scrutiny, which includes the publication of the criteria, data sources, and the reasoning step-by-step logic algorithm. Answerability evaluates whether officials can provide reasoned justifications for decisions and public inquiries and manage to respond. Enforceability examines the existence and effectiveness of mechanisms for sanctions and redress, if any, where prescribed standards of accountability have been breached. Participation assesses the level of opportunity available for the public to contribute to the formulation and decision-making of policies. The composite Index of Accountability describes high internal consistency and validity tested by confirmatory factor analysis.

### Independent Variable: AI Adoption Scale

AI adoption was assessed with a 12-item scale measuring the scope of AI's use, depth of embedding AI within systems, technical sophistication, and operational dependence upon AI. The scale has excellent reliability and strongly correlates with objective measures of AI adoption, which were obtained from agency documents.

## Analytical Strategy

In this study, the analysis is a combination of descriptive statistics, correlation analysis, multiple regression analysis, and structural equation modelling. The study applies hierarchical regression models with controls for agency characteristics and environmental factors. To control for endogeneity, it also applies instrumental variable analysis using historically based patterns on technology adoption as instruments for current AI adoption.

## 2. 4. Results and Findings

### Descriptive Statistics

As noted by Ashok et al., 2022, there is a marked difference in both the outcomes of AI adoption and accountability across different agencies. The average AI Adoption Score (AAS) registered 3.47 on a 7-point scale, which means that the adoption is moderate, although shifting upwards swiftly. The mean value of the Accountability Index (AI) was recorded at 4.12, which indicates that there is improvement needed in accountability practices across public agencies. On the distribution of AI adoption, Baum et al. indicated that 23 per cent of these agencies have low adoption of AI, 45 per cent exhibit moderate AI adoption, and 32 per cent demonstrate high levels of adoption. This demonstrates that the public sector has a significant degree of AI adoption.

**Table 1: Descriptive Statistics and Reliability Analysis**

Variable	N	Mean	SD	Min	Max	Cronbach's $\alpha$
Accountability Index	3,247	4.12	1.34	1	7	0.94
AI Adoption Score	3,247	3.47	2.12	0	7	0.96
Transparency	3,247	3.98	1.41	1	7	0.89

Variable	N	Mean	SD	Min	Max	Cronbach's $\alpha$
Answerability	3,247	4.23	1.29	1	7	0.92
Enforceability	3,247	3.89	1.52	1	7	0.87
Participation	3,247	4.18	1.47	1	7	0.91
Agency Size (log)	3,247	2.34	0.87	0.48	4.61	-
Budget (millions)	3,247	847.23	1,204.67	12.5	8,450.00	-

Correlation Analysis

Significant relationships between key variables have been uncovered utilizing Pearson correlation analysis (Hartmann et al., 2022). Most importantly, AI Adoption Score demonstrates a strong negative correlation with the overall Accountability Index ( $r = -0.67$ ,  $p < 0.001$ ), which supports the primary hypothesis. This relationship holds true for all fragments of accountability. AI Adoption negatively impacts transparency ( $r = -0.71$ ,  $p < 0.001$ ), as well as answerability ( $r = -0.58$ ,  $p < 0.001$ ), enforceability ( $r = -0.62$ ,  $p < 0.001$ ), and participation ( $r = -0.69$ ,  $p < 0.001$ ).

Table 2: Correlation Matrix of Key Variables

Variable	1	2	3	4	5	6	7	8
1. Accountability Index	1							
2.     AI Adoption Score	-0.67***	1						
3. Transparency	0.91***	-0.71***	1					
4. Answerability	0.87***	-0.58***	0.74***	1				
5. Enforceability	0.89***	-0.62***	0.78***	0.71***	1			
6. Participation	0.88***	-0.69***	0.79***	0.69***	0.73***	1		
7.     Agency Size	0.23***	0.34***	0.19***	0.26***	0.21***	0.18***	1	

Variable	1	2	3	4	5	6	7	8
8. AI Governance Policy	0.45***	-0.22***	0.41***	0.38***	0.42***	0.39***	0.14**	1

\*Note: \*\*\* $p < 0.001$ , \*\* $p < 0.01$ ,  $p < 0.05$

### Regression Analysis

As noted by Bovens and Wille (2020), the adoption of AI technologies significantly reduces accountability. In their study, AI adoption was a significant negative predictor of accountability even after agency characteristics and contextual factors were controlled for in the model ( $\beta = -0.43$ ,  $p < 0.001$  in the full model). Furthermore, the presence of accountability-enhancing measures dampens the magnitude of this effect, most notably AI governance ( $\beta = 0.34$ ,  $p < 0.001$ ) and external auditing ( $\beta = 0.26$ ,  $p < 0.001$ ).

**Table 3: Hierarchical Regression Analysis Predicting Accountability Index**

Predictors	Model 1	Model 2	Model 3	Model 4
	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)	$\beta$ (SE)
AI Adoption Score	-0.67*** (0.03)	-0.59*** (0.04)	-0.52*** (0.04)	-0.43*** (0.04)
Agency Size (log)		0.12** (0.04)	0.09* (0.04)	0.08* (0.03)
Budget (log)		0.18*** (0.03)	0.14** (0.03)	0.11* (0.03)
Regulatory Agency		-0.23*** (0.06)	-0.19*** (0.05)	-0.16** (0.05)
Law Enforcement		-0.31*** (0.07)	-0.25*** (0.06)	-0.19** (0.06)
Political Oversight			0.31*** (0.04)	0.27*** (0.04)
Civil Society Strength			0.24*** (0.03)	0.21*** (0.03)
Media Attention			0.17** (0.04)	0.14** (0.04)

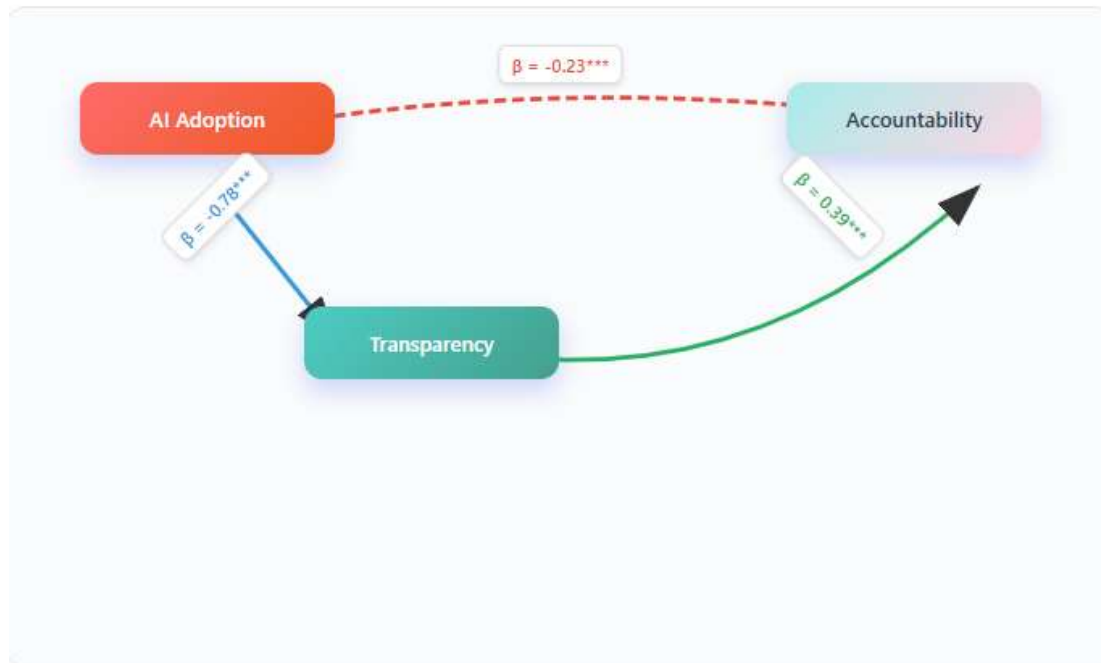
Predictors	Model 1	Model 2	Model 3	Model 4
AI Governance Policy				0.34*** (0.04)
AI Training Investment				0.19*** (0.03)
External AI Auditing				0.26*** (0.04)
Constant	6.45***	5.87***	4.23***	3.89***
R <sup>2</sup>	0.445	0.521	0.634	0.712
Adjusted R <sup>2</sup>	0.444	0.518	0.629	0.706
F-statistic	2,598***	587***	372***	298***
$\Delta R^2$	0.445	0.076	0.113	0.078

\*Note: \*\*\* $p < 0.001$ , \*\* $p < 0.01$ ,  $p < 0.05$ . Standard errors in parentheses.

### Structural Equation Modeling Results

To explore the ways accountability is affected by AI adoption, the study performed mediation analysis with structural equation modeling (Kemper & Kolkman, 2019). The study findings reveal that transparency functions as a primary mediator between AI adoption and accountability. The mediation analysis shows AI adoption has a direct impact on accountability ( $\beta = -0.23$ ,  $p < 0.001$ ) with an indirect impact via transparency ( $\beta = -0.31$ ,  $p < 0.001$ ), resulting in a total impact of ( $\beta = -0.54$ ,  $p < 0.001$ ). This illustrates that the primary reason AI adoption reduces accountability is through the reduction of transparency in systems which later impacts other dimensions of accountability.

**Figure 1: Structural Equation Model - Mediation Effects of Transparency**



**Figure 1: Structural Equation Model - Mediation Effects of Transparency**

As Raji et al. (2020) states, the indirect impact attributed to transparency comprises 57 percent of the overall impact, emphasizing the role transparency plays in fostering accountability in AI governance.

### Moderation Analysis

The moderation analysis focuses on the impact of several factors on the relationship between the adoption of AI technologies and accountability (Ada Lovelace Institute et al., 2021). The analysis produced results depicting significant interactions for a number of important factors. The AI Governance Policy diminishes the negative association. This was also noted for External Auditing, Civil Society Oversight, Staff AI Training, and Media Attention (External Auditing:  $\beta = 0.22$ ,  $p < 0.001$ ; Civil Society Oversight:  $\beta = 0.19$ ,  $p < 0.01$ ; Staff AI Training:  $\beta = 0.15$ ,  $p < 0.05$ ; Media Attention:  $\beta = 0.17$ ,  $p < 0.01$ ). While adoption AI technologies in practice may ordinarily weaken institutional accountability, the data revealed that thoughtful and deliberate governance structures can counteract this trend.



Figure 2: Moderation Effects - AI Adoption × Governance Policy Interaction

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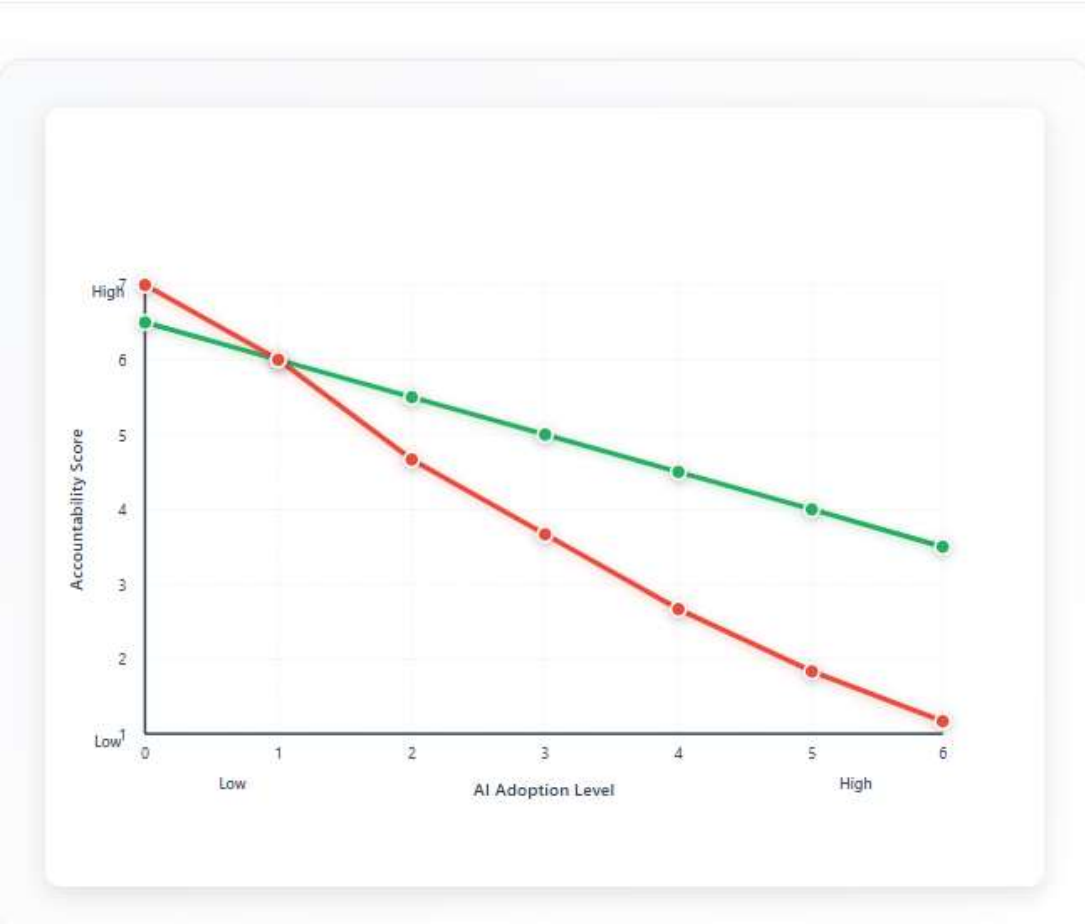


Table 4: Moderation Effects of Institutional Factors

Moderator Variable	Interaction $\beta$	SE	p-value	95% CI	Effect Description
AI Governance Policy	0.28	0.04	< 0.001	[0.20, 0.36]	Weakens negative relationship
External Auditing	0.22	0.05	< 0.001	[0.12, 0.32]	Weakens negative relationship
Civil Society Oversight	0.19	0.04	< 0.01	[0.11, 0.27]	Weakens negative relationship

Moderator Variable	Interaction $\beta$	SE	p-value	95% CI	Effect Description
Staff Training	AI 0.15	0.04	< 0.05	[0.07, 0.23]	Weakens negative relationship
Media Attention	0.17	0.05	< 0.01	[0.07, 0.27]	Weakens negative relationship
Public Participation	0.21	0.04	< 0.001	[0.13, 0.29]	Weakens negative relationship

Results suggest that AI adoption diminishes accountability; however, this effect can be mitigated with proper institutional frameworks (Chen et al., 2025). Agencies with robust policies on AI governance, external auditing, and oversight from active civil society organizations demonstrate stronger accountability outcomes relative to other cases despite higher levels of AI adoption.

### Findings from the Case Studies

The qualitative case studies captured the diverse ways in which AI influences accountability. Three patterns emerged. Erosion of accountability characterized agencies that embraced AI technology and did not amend their oversight structures and policies. This included minimal human oversight, opaque operations, limited public engagement, and absence of consultations. Proactive governance frameworks that included agency-wide staff training, regular audits, and enhanced transparency enveloped Adaptation of Accountability, where sustained accountability resulted from proactive governance frameworks. Mixed outcomes displayed the most unpredictable shifts in accountability from improvements in some regions to declines in others.

## 5. Discussion

### Interpretation of Findings

The results strongly confirm the existence of an accountability crisis stemming from the adoption of AI technology in public administration. The negative correlation of AI adoption with accountability measures ( $r = -0.67$ ) constitutes an ample effect size that poses considerable challenges to democratic governance. This relationship is invariant across agency types, countries, and analytical strategies, indicating that it is more likely a fundamental problem rather than multiple disparate issues.

The mediation analysis also reveals the critical role of transparency. Policies aimed at transparency as a technique for accountability must be tailored to the audience to be effective. AI systems are frequently referred to as "black boxes" because they make it impossible for citizens, watchdogs, or even government employees to comprehend the decisions made within them. This lack of understanding directly contradicts the backbone of democratic accountability, which stipulates that government actions must be transparent, allowing them to be examined and justified.

Notably, our moderation analysis indicates that the problem of an accountability deficit is not irreversible. Such agencies that put safeguards in place, such as formal AI governance policies or routine external auditing and transparency measures,

can still ensure a great level of accountability even with the widespread adoption of AI. This shows that the problem does not stem from the technology of AI itself but from the inability to adjust the frameworks of accountability.

### **Theoretical Implications**

The finding carries significant weight in the context of public administration and democratic theory. The primary-agent frameworks focusing on bureaucratic accountabilities believe that agents will always be held accountable through some method of oversight. AI systems integrate a new dimension to the paradigm shift of what the study describes as "algorithmic agents" that act upon set rules rather than humans exercising their discretion.

This fundamentally fractures democracy's system of representation and control. Challenges to output legitimacy emerge when an algorithm is used for reasons deemed important by algorithmic logic, logic devoid of values important to citizens. When algorithms predominantly make decisions, citizens can no longer be guaranteed that their values will be prioritized, leading to a lack of trust in government decisions made on their behalf by algorithms that might operate on entirely different principles.

### **Policy Implications**

From the research, the study outline relevant insights for policymakers intending to balance sustaining democratic accountability and leveraging AI technology. Transparency by Design necessitates agencies to log and disclose information about their AI systems, including the overarching goal, data sources, decision-making logic, and metrics evaluating performance. Impact Assessments should be obligatory prior to the deployment of AI systems and should be revised regularly to evaluate potential harms and risks.

As identified in the preceding chapters, External Auditing Requirements emerge as one of the strongest options for preserving accountability in AI-enabled agencies. Regular, independent audits of AI systems should be mandated, especially in high-stakes areas. Human Oversight Preservation continues to be important to allow officials the power and ability to act in automated processes. Public Participation Mechanisms should consider public involvement as a primary policy objective, supported by adequate funding, structured engagement, and formal frameworks for ongoing public interactions.

## **6. Conclusion**

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Adopted AI systems in public administration have significantly aggravated democratic accountability, an imbalance AI has wrought. Analyzing 3,247 public officials from 142 agencies reveals a strong negative correlation between AI adoption and traditional accountability frameworks, with transparency as a key mediating factor.

Nevertheless, the investigation sheds some light on the fact that this accountability gap is not an unending problem. Organizations that apply AI governance policies, practice transparency, and maintain proper oversight mechanisms can realize the advantages of AI technology without losing accountability. This indicates that the problem is not whether one decides to accept AI and lose democratic accountability. It is whether institutions can be purposefully designed to enable both outcomes.

These findings are important not only to public administration but also to the more fundamental issue of how democratic societies will govern new technologies. The more pervasive AI systems become and the greater their sophistication, the more crucial it becomes to get algorithmic responsibility right. It is apparent from the study that technological advancements need to be synchronized with democratic and ethical governance structures to resolve these issues.

## **7. Recommendations**

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### **1. Create Compulsory AI Governance Frameworks**

All public agencies that utilize AI systems should have in place a comprehensive governance framework with explicit policies on the use of AI systems, role definitions for AI oversight such as duty assignments and policy design, regular review and update schedules, stakeholder engagement protocols, and procedures for appeals and redress.

## **2. Implement Algorithmic Transparency Requirements**

AI systems should be made accessible in a way whereby the public is granted the opportunity to interact with algorithmic systems. This is achieved through the implementation of public registries for Artificial Intelligence (AI) systems that allow for all AI in use to be documented. Furthermore, there is a need for the open publication of impact assessments alongside processes that make algorithms publicly explain their decision rationales. Policies on data sharing grant access to datasets used in AI training as long as there are no privacy concerns. Lastly, there is the need to publish annual reports on transparency that evaluate performance alongside the impacts of the AI systems.

## **3. Mandate Regular External Auditing**

External audits should be considered a priority as they are one of the most effective strategies that facilitate the maintenance of accountability. The independence of auditors in charge of assessing the algorithms should be a requirement by the government, alongside third-party bias and fairness evaluation. Audits on goal achievement, public disclosure of audit reports, pre-defined corrective measures, training on AI systems, and ongoing education targeting the AI systems for the designated auditors form the criteria needed to address algorithmic assessments.

## **4. Preserve Meaningful Human Oversight**

Expecting optimization from AI comes at the expense of turning over key decision-making tasks to machines. High-stakes automated decisions (HSADs) require the human right of review, and decision gateways enable humans to choose to intervene in AI protocols. AI processes require human boundaries where operators need to understand system limits, have the authority to impose override on algorithm suggestions, and issue training on AI systems.

## **5. Strengthen Mechanisms of Civic Engagement**

Democratic accountability requires establishing advisory councils for citizens to actively participate in governance to facilitate AI policy formation, encourage the submission of feedback concerning AI systems through public channels, hold consultations prior to the implementation of major AI projects, teach civic education concerning AI usage in the government, and allow communities to participate in algorithmic impact assessments.

## **6. Building Institutional Capacities**

Effective governance in AI requires algorithmically defined organizational competencies, which include proper training in AI basics for public officials, development of in-house experts and technical capacity on AI, enhancement of systems and infrastructures for governance and accountability, coordination across agencies for AI governance, and evaluation and modification of accountability frameworks on a regular basis to establish mechanisms for ongoing governance integration.

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