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Algocracy and Capillaries of Power: A Critical Analysis of Hidden Power in Artificial Intelligence-Based Decision Making in the Public Sector

Iffan Gallant El Muhammady[1*], Haressa L. Rizkika [2]

[*1]Muhammadiyah University of Jember
[2]Airlangga University

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*Correspondensi: Iffan Gallant El Muhammady
Email: iffangallant@unmuhjember.ac.id

Abstract: Public-sector AI is often framed as a technical upgrade to governance, yet its design and deployment are saturated with power. This article develops an operational lens—the "capillaries of power"—to analyze how code, data, and algorithmic architectures shape public accountability. Using a critical thematic synthesis of recent scholarship (2022–2025), we map four recurring modalities through which power is enacted in AI governance: displacement of responsibility, epistemic opacity, embedded bias, and algorithmic surveillance. We detail the analytic workflow (from corpus selection and initial coding to inductive–deductive theme building and argumentative validation) and translate insights into actionable counter-power protocols: meaningful participation, public auditability, human oversight at decisive junctures, and risk-proportionate constraints on high-risk applications. Illustrative policy implications are drawn for Indonesia, including human-in-final-loop arrangements in social assistance targeting, public scorecards for fiscal analytics, ex-ante bias testing for AI-assisted recruitment, and moratorium-by-design for biometric surveillance in "smart city" systems. The study's contribution is twofold: conceptually, it operationalizes a power-analytic vocabulary for AI governance; practically, it offers a minimal checklist that policy makers in developing countries can use to ensure that AI adoption strengthens—rather than weakens—democratic accountability and social justice.

Keywords: algocracy, capillaries of power, algorithm ethics.

Introduction

In the past two decades, artificial intelligence (AI) technology has experienced rapid development and penetrated various sectors of life, including government and public services. Governments in various countries, including Indonesia, have started to integrate AI to improve efficiency, accuracy, and transparency in administrative decision-making. From algorithm-based recruitment systems to big data–based social assistance distribution, AI is often positioned as an objective solution to various bureaucratic governance problems. However, this narrative of efficiency and innovation often obscures a more fundamental issue: how power is distributed, hidden, and exercised through AI systems.

Contemporary studies have highlighted various ethical and legal challenges in the application of AI, including algorithmic bias, lack of transparency, and weak accountability (Chauhan, Thakur, Joshi, & Singh, 2024; Guan, Dong, & Zhao, 2022; Ricciardi Celsi & Zomaya, 2025). Even in the context of health, law, and human resources, researchers underline the risks of AI in reinforcing structural inequalities and removing the autonomy of human decision-makers (Cacciamani, Chen, Gill, & Hung, 2024; Alboré, Castelnovo, Valle, & Tessaro, 2025). While these normative approaches offer important insights, they often neglect the underlying power dynamics embedded in algorithmic systems.

To address this gap, this article adopts a theoretical framework grounded in the concept of *capillary power*, originally articulated by Foucault (1977, 1978), who viewed power not as centralized or held, but as diffused through institutional, discursive, and technological networks. Power is not merely repressive but productive—it constructs subjects, norms, and truths through disciplinary mechanisms and surveillance. This view is extended by Muhammady (2024), who introduced the framework of the *hidden capillaries of power*, particularly in the context of digital governance. In his formulation, power in AI-based systems operates through three main mechanisms: naturalization (technological systems are viewed as neutral and scientific), displacement (decision-making responsibility shifts from humans to systems), and opacity (technical complexity prevents public understanding and accountability). These dynamics render AI systems not just tools of administration, but infrastructures of governance that shape public reasoning and classification without public scrutiny.

This framework is especially relevant when considering the emergence of *algocracy*—a form of rule enacted by algorithms rather than through human deliberation (Ricciardi Celsi & Zomaya, 2025). Algocratic logic tends to prioritize statistical prediction and efficiency over political accountability and participation, often reinforcing exclusionary decision-making processes. For example, recruitment algorithms may appear transparent but embed historical and systemic bias that erodes individual agency and democratic deliberation (Panduro-Ramirez, Damodaraswamy, Gehlot, & Alazzam, 2023).

Thus, AI must be viewed not merely as an administrative instrument, but as a political actor that governs through code, data, and hidden infrastructures (Cacciamani et al., 2024; Daidai & Tamnine, 2023). This article positions AI governance within this broader socio-political landscape to reveal how algorithmic systems reproduce inequality, depoliticization, and technocratic dominance.

This study aims to explore and map the hidden capillaries of power in the use of AI for decision-making in the public sector. Using a thematic analysis of academic and policy literature, this paper proposes a conceptual framework that shows how AI systems operate as diffused, technocratic networks of power that often escape public scrutiny. The article also offers policy recommendations based on *capillary ethics*, emphasizing

participatory algorithm review, public auditability, embedded human oversight, and counter-power protocols in the design and implementation of AI in public governance.

Structurally, this paper is divided into six main sections. The second section presents the theoretical framework of *hidden capillaries of power* and its reinterpretation of technology's role in governance. The third section outlines the analytical method, based on thematic literature review. The fourth section presents findings on how hidden power is embedded in public AI systems. The fifth discusses the ethical, social, and political implications, and the sixth provides policy recommendations. The final section concludes with the main findings and proposes future directions for research on technology ethics and power.

Method

Research Design

This research uses an exploratory qualitative approach based on thematic analysis of academic literature, with a critical orientation towards ethics and power in AI governance. The main objective of this approach is to identify, classify and evaluate the hidden forms of power manifested in AI-based public decision-making practices. Instead of conducting field studies or interviews, this article focuses on conceptual mapping through critical literature synthesis, which is a literature review that not only describes the findings, but also questions the normative and ideological assumptions contained in existing AI governance studies.

Data Corpus and Selection Criteria

The study analyzes a corpus of 14 relevant and representative academic articles on AI ethics, public governance, and the social implications of algorithmic technologies. The sources come from highly indexed journals and proceedings (e.g., IEEE, IGI Global, Springer Nature) and other peer-reviewed venues at the intersection of technology, law, and human rights.

Inclusion criteria:

1. publication year 2022–2025 & outside 2022-2025;
2. substantive focus on AI in the public sector or AI regulation more broadly;
3. engagement with ethics, transparency, bias, accountability, or human rights;
4. written in English and open access or available through legitimate scholarly channels.

Exclusion criteria:

1. purely technical articles (e.g., optimization, signal processing) lacking normative analysis;
2. studies centered on private/commercial contexts without a governance connection;
3. review pieces that do not discuss ethical or legal dimensions.

All search and selection actions were logged with metadata (title, venue, DOI, year) and explicit reasons for inclusion/exclusion to ensure auditability. These are the 11 articles, 2 Foucault books, and 1 dissertation referred to:

1. Aldemir, C., & Uçma Uysal, T. (2025). *Administrative Sciences*.
2. Ricciardi Celsi, L., & Zomaya, A. Y. (2025). *Information (Switzerland)*.
3. Guan, H., Dong, L., & Zhao, A. (2022). *Behavioral Sciences, 12*(3), 91.
4. Prorok, M., & Takacs, I. (2023). IEEE SISY Proceedings.
5. Chauhan, N., Thakur, G., Joshi, A., & Singh, Y. (2024). In IGI Global volume (Responsible AI).
6. Cacciamani, G. E., Chen, A., Gill, I. S., & Hung, A. J. (2024). *Nature Reviews Urology*.
7. Daidai, F., & Tamnine, L. (2023). CEUR Workshop Proceedings.
8. Kalkan, G. (2024). *Journal of Corporate Finance Research*.
9. Lee, L. A., Duraković, B., & Yeralan, S. (2025). *Heritage and Sustainable Development, 7*(1), 34–49.
10. Panduro-Ramirez, J., Damodaraswamy, A., Gehlot, A., & Alazzam, M. B. (2023). IEEE ICACITE Proceedings.
11. Alboré, N., Castelnovo, A., Valle, M. D., & Tessaro, S. (2025). CEUR Workshop Proceedings (HRM under the AI Act).
12. Muhammady, I.G.E. (2024). Doctoral dissertation (Universitas Airlangga).
13. Foucault, M. (1977). *Discipline and Punish: The Birth of the Prison*.
14. Foucault, M. (1978). *The History of Sexuality, Vol. 1: An Introduction*.

Analytics Workflow

We employed a reflective, critical thematic approach oriented by the "hidden capillaries of power" framework on Figure 1. The workflow comprised eight linked stages:

1. Corpus Selection
   Purpose: Identify a relevant, auditable body of literature.
   Inputs: included databases and repositories aligned with the inclusion criteria above.
   Process: directed search; title/abstract screening; full-text review; creation of a searchable audit log.
   Outputs: a verified list of 14 articles and a complete search log.
   Quality control: duplicate removal; explicit exclusion reasons; checks for thematic coverage.
2. Initial Coding (Power-Sensing Categories)
   Purpose: Capture recurring signals of how power operates.
   Inputs: corpus articles and a seed codebook (e.g., naturalization, displacement of responsibility, epistemic opacity, embedded bias, algorithmic surveillance).

Process: manual, line-by-line coding of meaning units; annotation of key passages; iterative refinement of code definitions.
Outputs: Codebook v1 and coded excerpts.
Quality control: peer debriefing/inter-coder discussion and inclusion/exclusion examples for each code.

3. Theme Building (Inductive-Deductive)
   Purpose: Aggregate codes into theoretically coherent themes and subthemes.
   Inputs: Codebook v1, the power-analytic framework, and coded data.
   Process: merging/splitting codes; mapping relations among codes; aligning emergent themes with the theoretical lens.
   Outputs: a theme–subtheme map with operational definitions.
   Quality control: saturation checks; cross-study validity; harmonization of terminology.
4. Critical Thematic Synthesis via an "Algorithmic Capillaries" Matrix
   Purpose: Integrate findings across studies into four core modalities.
   Inputs: the theme map, evidentiary quotes, and illustrative cases.
   Process: placing findings in a matrix (rows: modalities; columns: evidence/cases/consequences) to distill convergences and divergences.
   Outputs: a synthesis matrix and a cross-study narrative.
   Quality control: triangulation of examples and consistency checks linking claims to evidence.
5. Argument Validation And Consistency Checks
   Purpose: Ensure logical coherence and avoid overreach. Inputs: the draft synthesis and a claim-to-citation list.
   Process: internal peer debriefing; back-tracing each claim to evidence; harmonizing technical terms and time spans.
   Outputs: a validated argumentative draft and revision notes.
   Quality control: a checklist covering terminology, years, and citations; corrections for over-/under-claiming.
6. Policy Translation And Counter-Power Protocols
   Purpose: Convert findings into operational recommendations.
   Inputs: the synthesis matrix, regulatory context, and stakeholder needs.
   Process: mapping findings to instruments (meaningful participation, public auditability, human oversight, proportionate limits) and drafting step-by-step procedures.
   Outputs: ready-to-use policy protocols and sample SOP/clauses.
   Quality control: feasibility and impact review; conformity with applicable law.
7. Documentation And Transparency
   Purpose: Make the process auditable and reproducible.
   Inputs: all work artifacts (search logs, codebook versions, matrices).
   Process: preparing a methods figure (flowchart) and a stage-summary table; versioning of data, models, and codebooks.

Outputs: a flowchart (Fig. 1), a stage-summary table, and a methodological appendix/PRISMA-style log.
Quality control: end-to-end traceability from claims to sources and maintained version history.

8. Public Engagement And Iteration
Purpose: Close the loop with public feedback and continuous improvement.
Inputs: draft protocols, public scorecards, and consultation/appeals channels.
Process: publishing plain-language scorecards; holding consultations/hearings; operating appeal mechanisms; scheduling periodic updates.
Outputs: publicly overseen implementation, recorded feedback, and routine revisions.
Quality control: service-level targets for responses; agreed success indicators; periodic indpendent audits.

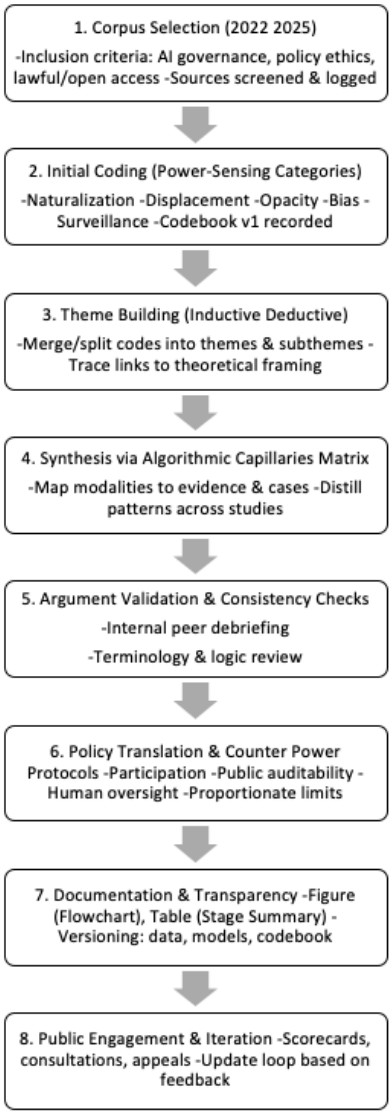

Figure 1. Analytics Workflow

Analysis Technique

Consistent with steps 2–4 above, analysis proceeded through three nested moves:

1. Initia; Theme Identification
   Each article was read closely and manually coded using categories grounded in the hidden capillaries of power (e.g., technological naturalization, displacement of responsibility, systemic bias, algorithm masking).
2. Category And Subtheme Development
   Initial codes were organized into themes and subthemes through inductive–deductive cycling. For instance, "epistemic opacity" emerged out of discussions of non-explainable AI and barriers to public audit.
3. Critical Thematic Synthesis
   Themes were interrogated in relation to power—not merely formal ethics—emphasizing how technical systems can reproduce or disguise control and exclusion in public decision-making.
4. Argument Logic Validation
   The thematic results were compared with Foucault's and Muhammady's theoretical framework to ensure analytical consistency while guarding against confirmation bias.

Validity and Limitations

Internal validity rests on accurate source selection, transparent coding logic, and coherence between theory and findings. External validity is necessarily constrained by the literature-based design; generalization to on-the-ground practice should be cautious. The study's distinctive value lies in opening a power-analytic lens within AI ethics, an area still under-examined in technology studies.

Ethical Considerations and Trustworthiness

No human participants or primary field data were involved; formal ethics approval was therefore not required. All materials were obtained via legitimate, open-access academic platforms to ensure scholarly integrity. Trustworthiness was supported through transparent selection criteria, careful coding procedures, rigorous cross-validation of interpretations against the theoretical framework, and full documentation enabling audit and replication.

Results And Discussion

This study identified four dominant patterns of how hidden capillaries of power operate within artificial intelligence (AI)-based decision-making systems in the public sector. Thematic analysis reveals that these patterns—though interconnected—are analytically distinct and demonstrate how AI not only facilitates decisions, but also reshapes and embeds new power structures into bureaucratic governance.

Displacement of Responsibility: When Accountability is Deregulated

One key finding concerns the delegation of decision-making responsibility from human agents to opaque algorithmic systems. As highlighted in studies by Prorok & Takacs (2023) and Guan et al. (2022), AI decisions—such as those related to social

assistance or civil service selection—frequently lack clear attribution. As a result, when citizens are disadvantaged by such decisions, they find no responsible party to hold accountable. This signals a rupture in the accountability chain. AI systems present themselves as "neutral," yet their design embodies specific values and interests. Power thus becomes more deeply embedded—and shielded—when located within non-transparent systems.

Epistemic Opacity and Technical Elitism: Power Through Ignorance

Another result highlights epistemic opacity—users, policymakers, and even auditors are unable to comprehend algorithmic logic (Ricciardi & Zomaya, 2025). This inhibits contestation or feedback mechanisms. In recruitment systems, for instance, the selection criteria are concealed, leading to a new form of technical elitism in which only data engineers understand and control the system. Drawing on Foucault's framework, this signifies a hidden knowledge-based power that produces institutional truth.

Bias Embedded in 'Objective' Systems: Reproducing Inequality Through Pseudo Neutrality

Literature reviewed from Panduro-Ramirez et al. (2023) and Cacciamani et al. (2024) shows that algorithmic bias is often systemic, not incidental. Historical training data reflect structural inequalities—such as those based on race, gender, or geography—and AI models reproduce these biases. For instance, risk prediction systems often flag marginalized individuals as "high-risk," not based on objective projections, but due to historically distorted data patterns. In this case, technological neutrality becomes a myth, as AI covertly reinforces dominant social orders under the guise of objectivity.

Algorithmic Surveillance and Micro-Governance: Power Through Predictive Discipline

AI is also found to function not only in macro-level decisions but as a tool of behavioral control through prediction, monitoring, and automation (Aldemir & Uçma Uysal, 2025). Systems flag "risky" individuals or institutions, prompting behavioral adjustment without explicit instruction. This aligns with Foucault's concept of the digital panopticon—where constant algorithmic observation enforces internalized compliance. As a disciplinary mechanism, AI becomes silent yet effective in shaping norms and behavior.

Synthesis: Algorithmic Power Capillary Matrix

Table 1 synthesizes how specific AI functions align with distinct modalities ("capillaries") of hidden power. Each row links: the capillary type (what kind of power dynamic is at work), the dominant AI function involved (what the system mainly does), the mode of power (how power is exercised), and the downstream consequences (what gets lost, distorted, or displaced in ethical–political terms). Read across the row to see the mechanism, then use the example and policy lever to anchor practice.

As Table 1 indicates, each capillary concentrates and conceals power in a different way: by shifting responsibility from officials to models (displacement), enclosing

meaning within technical expertise (opacity), encoding existing social asymmetries (embedded bias), or disciplining behavior through anticipatory surveillance (algorithmic surveillance).

Table 1. Algorithmic Power Capillary Matrix

Power Capillary Type	AI Function	Power Mode	Ethical and Political Consequences
Displacement of Responsibility	Decision-making	Deregulation of accountability	Loss of trace of responsibility
Epistemic Opacity	Interpretability	Technological elitization	Loss of the right to know
Embedded Bias	Classification	Reproduction of inequality	Data-driven systemic discrimination
Algorithmic Surveillance	Monitoring	Predictive (panoptic) discipline	Automation of compliance without deliberation

Source: data were analyzed

Together, these modalities explain why "neutral tools" can actively construct new forms of governance and subtly reconfigure democratic commitments to accountability, transparency, equality, and deliberation. The next section elaborates each modality in relation to the study's objectives and prior literature, translating them into actionable safeguards for policy and practice.

Revisiting AI Ethics: From Norms to Power

While conventional AI ethics literature emphasizes values such as transparency and fairness (Chauhan et al., 2024; Lee et al., 2025), these principles alone are insufficient. They assume external regulatory mechanisms can ensure justice, but fail to interrogate the embedded power structures within AI systems themselves. The hidden capillaries of power approach reorients this focus by asking: how is power produced and exercised by AI-and over whom? For example, recruitment algorithms may appear transparent but still perpetuate systemic gender or racial bias due to biased training data (Panduro-Ramirez et al., 2023).

Democracy vs. Algocracy: The Paradox of Digital Governance

The rise of AI governance presents a tension between democratic deliberation and technocratic automation. Algorithms are designed to optimize efficiency and predictability, but in doing so, they often sideline participatory decision-making. Aldemir, C., & Uçma Uysal, T. (2025) demonstrate that fiscal AI audits produce "risk signals" without human deliberation, shifting governance from discussion to detection. If the public cannot question algorithmic outcomes, AI begins to act not merely as a tool, but as an autonomous authority.

Knowledge Inequality and Data Capitalism

The technical complexity of AI creates a knowledge asymmetry between the governed and the governing (Ricciardi & Zomaya, 2025). Only select experts understand the system, leading to what Kalkan (2024) describes as "algocratic exclusion." In data capitalism, individuals generate data unknowingly, which is then used by states and corporations for governance and profit. This shift raises deeper questions about data ownership, algorithmic authorship, and the democratic deficit in AI governance.

Policy Implications for Indonesia

In the Indonesian context, predictive systems used in eligibility determinations (e.g., social-assistance targeting) routinely blur who is answerable for adverse outcomes; once decisions are framed as model outputs, accountability diffuses across tools and procedures, undermining effective remedies (Barocas & Selbst, 2016; Kroll et al., 2017; Ananny & Crawford, 2018). To prevent responsibility from being ceded to "the machine," agencies should require a designated human approver for consequential decisions and issue a citizen-readable decision trace (key inputs, thresholds, model/version, and justification) to support appeals. Such requirements can rest on existing legal and institutional scaffolding—Public Services and Information Disclosure laws, the e-government architecture that assigns business-process ownership (Sistem Pemerintahan Berbasis Elektronik, SPBE), and data custodianship roles under Satu Data Indonesia—while dovetailing with DTKS (Data Terpadu Kesejahteraan Sosial) verification–validation routines and SP4N-LAPOR! as the national grievance backbone (Law No. 25/2009; Law No. 14/2008; Presidential Reg. No. 95/2018; Presidential Reg. No. 39/2019).

Epistemic opacity arises when fiscal-risk or spending-appropriateness indicators are inscrutable to local actors; publishing code or datasets alone does not produce comprehension without interpretability tools and institutional context (Mittelstadt et al., 2016; Doshi-Velez & Kim, 2017; Janssen & van den Hoven, 2015; Zuiderwijk et al., 2014). A plain-language public scorecard—indicator definitions, consequence mapping for rating bands, explicit thresholds, and model/version metadata—enables councils, civil society, and the media to perform meaningful oversight. Operationally, agencies can align the scorecard with SAKIP-style disclosure (Sistem Akuntabilitas Kinerja Instansi Pemerintah), release underlying datasets via SIPD (Sistem Informasi Pemerintahan Daerah) using Satu Data–compliant metadata, and fulfill proactive publication duties under the Information Disclosure Law (Presidential Reg. No. 39/2019; Law No. 14/2008).

Embedded bias emerges when training data under-represent regions, genders, or vulnerable groups; fairness is not automatic and frequently entails structural trade-offs (Hardt et al., 2016; Kleinberg et al., 2017; Chouldechova, 2017). Prior to AI-assisted pre-screening (e.g., recruitment), agencies should run ex-ante bias tests with stratified/synthetic samples, audit dataset composition for representativeness, and implement mitigation (re-weighting, threshold parity), recording all steps through standardized model reporting (Mitchell et al., 2019). In Indonesia, these controls can be

codified within SPBE service SOPs and aligned to Personal Data Protection Law principles—purpose limitation, minimization, and accountability—while providing anonymized audit summaries to inspectorates, the ombudsman, and civil society (Presidential Reg. No. 95/2018; Law No. 27/2022).

"Smart city" deployments require caution: biometric and crowd analytics can chill everyday civic life and impose disproportionate burdens on vulnerable groups; necessity–proportionality and rights-impact testing are thus indispensable (Brayne, 2017; Ferguson, 2017; Mantelero, 2018; Veale & Edwards, 2018). A moratorium-by-design should govern high-risk biometric uses (e.g., facial recognition, emotion inference) unless a Data Protection Impact Assessment (DPIA) proves strict necessity and superior effectiveness compared to less intrusive measures. Consistent with the Personal Data Protection (PDP) Law and human-rights standards, DPIAs should lay out the lawful basis, diagram data flows and retention, assess risks to rights and freedoms, define safeguards and redress, and publish a non-technical summary (Law No. 27/2022). Municipalities should also designate biometric-free "citizen zones" (e.g., schools, clinics, houses of worship, service halls) and keep public registries of sensor locations to enact proportionality and enable oversight.

Toward a Responsive and Transformative AI Ethic

Risks posed by public-sector AI cannot be addressed through compliance checklists alone. Ethics must become responsive—able to listen, weigh, and adapt—and transformative—willing to alter the rules when existing structures prove unjust. The following framework articulates three practical principles and their concrete implementation.

1. Deliberative: create genuine spaces for public questioning
   AI systems should equip citizens to comprehend, interrogate, and contest algorithmic decisions. This entails explaining decision rationales, the data used, and model versions in language accessible to non-experts, alongside clear, time-bound appeal channels.
   In practice: issue decision-trace notices for every adverse determination; conduct pre-deployment public consultations; and hold periodic feedback forums with mandatory follow-up actions.
2. Democratic: include affected populations in design and evaluation
   Design, piloting, and evaluation should embed the perspectives of those most affected—including vulnerable communities—rather than resting solely on expert or bureaucratic judgment. The goal is for "success" metrics to reflect lived needs, not only technocratic priorities.
   In practice: establish standing panels of citizens/CSOs within project teams; run limited pilots with structured feedback loops; and publish plain-language public scorecards to enable oversight by councils, media, and communities.

3. Transformative: dismantle injustices embedded in code and data Ethics must go beyond "risk minimization," remaining willing to revise datasets, rules, and even policy objectives where they entrench inequity. This requires addressing systemic bias and reforming data governance, not merely "explaining" problematic models.

In practice: conduct ex-ante bias audits using stratified/synthetic samples; apply mitigation strategies (e.g., re-weighting, threshold parity); adopt targeted moratoria for high-risk biometric uses; and require DPIAs before deployment.

Conclusion

This study demonstrates that public-sector AI is never neutral; it is configured by capillaries of power that flow through code, data, and algorithmic architectures. By mapping four modalities—displacement of responsibility, epistemic opacity, embedded bias, and algorithmic surveillance—we reframe the relationship between technical design and public accountability. The findings extend AI-governance scholarship grounded in power theory and indicate concrete institutional remedies. The article's primary contribution is an operational "capillaries of power" lens for examining how algorithmic systems shape governance—and a set of four counter-power protocols that can be applied directly to restore democratic accountability in public-sector AI.

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