



The Embedding of Fairness Value in Algorithmic Administrative Discretion

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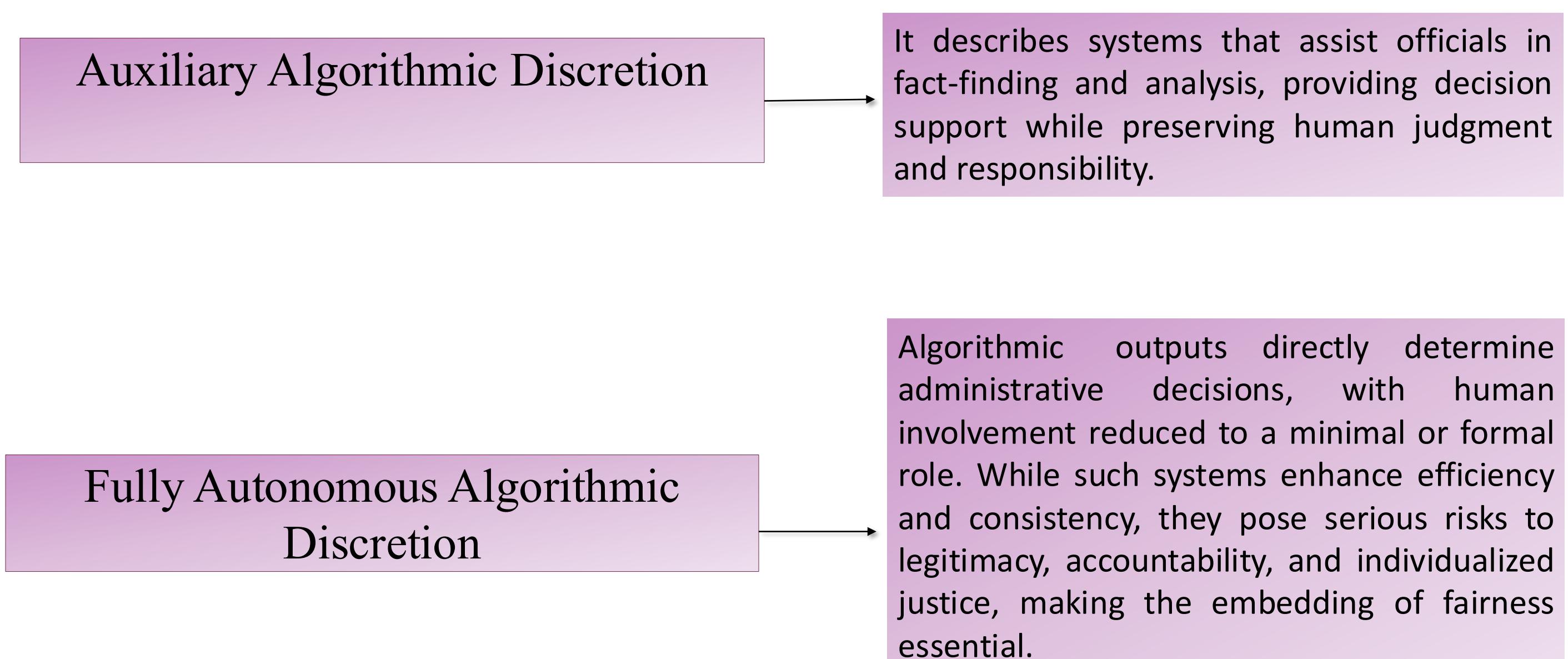


Introduction:

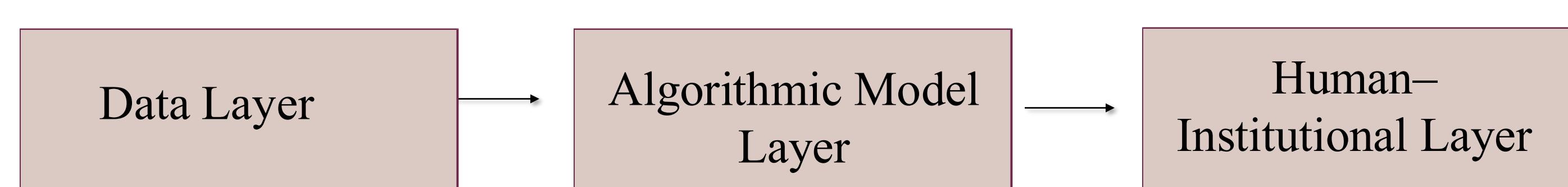
Algorithms are increasingly integrated into public administration, transforming discretionary decision-making that was once exercised by human officials into data-driven and automated processes. This shift—commonly described as *algorithmic administrative discretion*—reshapes how facts are evaluated, norms are applied, and administrative outcomes are produced. While algorithmic discretion promises efficiency and consistency, it also poses profound legal and ethical challenges, particularly to the principle of fairness, a core value of administrative legitimacy. Algorithms are not value-neutral; their design choices, data structures, and institutional deployment may distort or dilute fairness if left unchecked. This paper argues that fairness should not be treated as an external compliance requirement, but as an internal normative logic that structures algorithmic administrative discretion from within. It proposes a conceptual and institutional framework for embedding fairness into the design, operation, and oversight of algorithmic discretion, ensuring that the digitalization of public administration remains anchored in the rule of law.

Conceptual Framework: The Structure and Dynamics of Algorithmic Administrative Discretion:

1. Types of Algorithmic Administrative Discretion

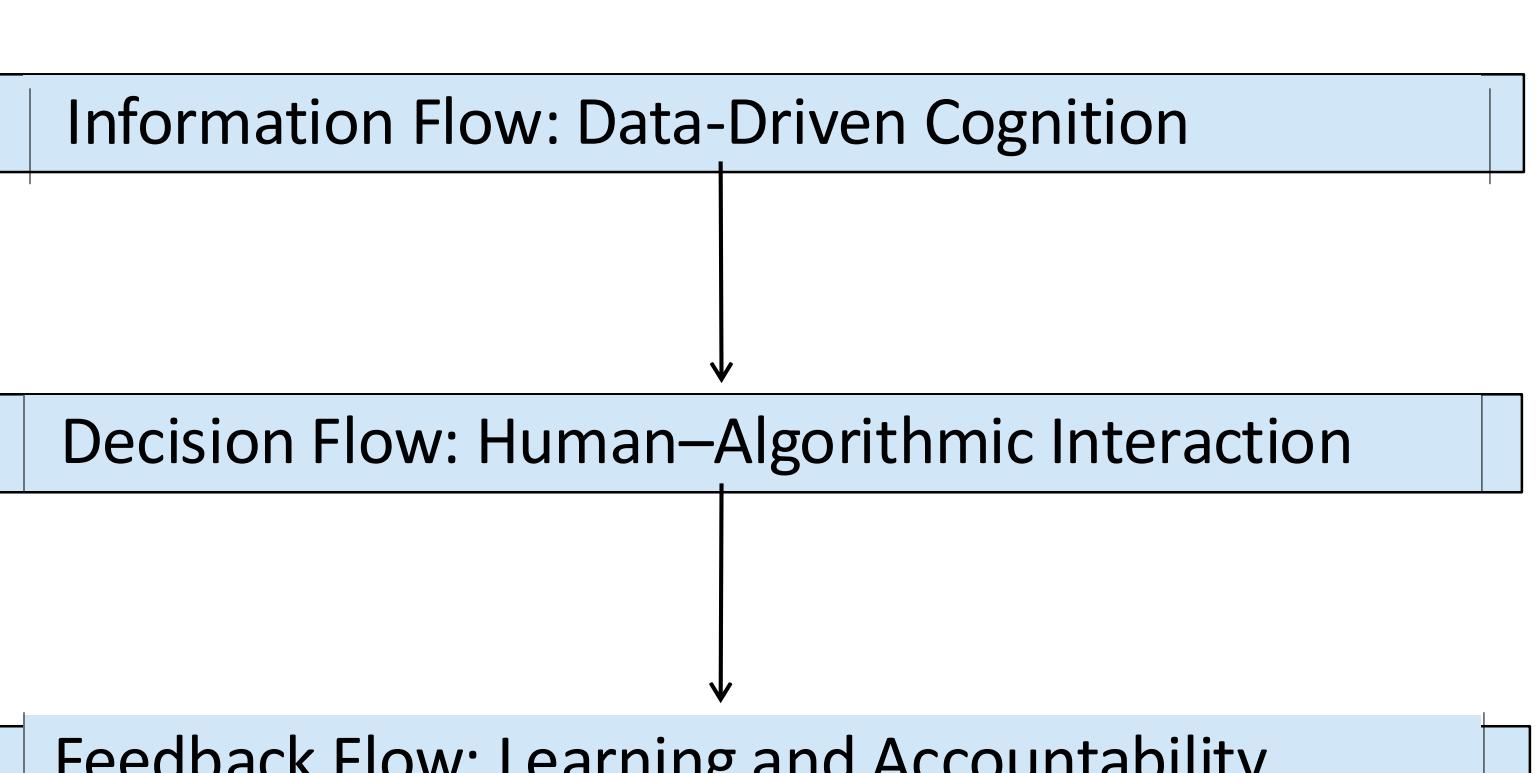


2. Internal Structure



The data layer shapes which facts become computable, the model layer encodes discretionary reasoning into algorithms, and the human-institutional layer ensures legal oversight, responsibility, and remedies. Together, these layers reveal algorithmic discretion as a reconstructed form of administrative power rather than a neutral technical tool.

3. Operational Mechanisms



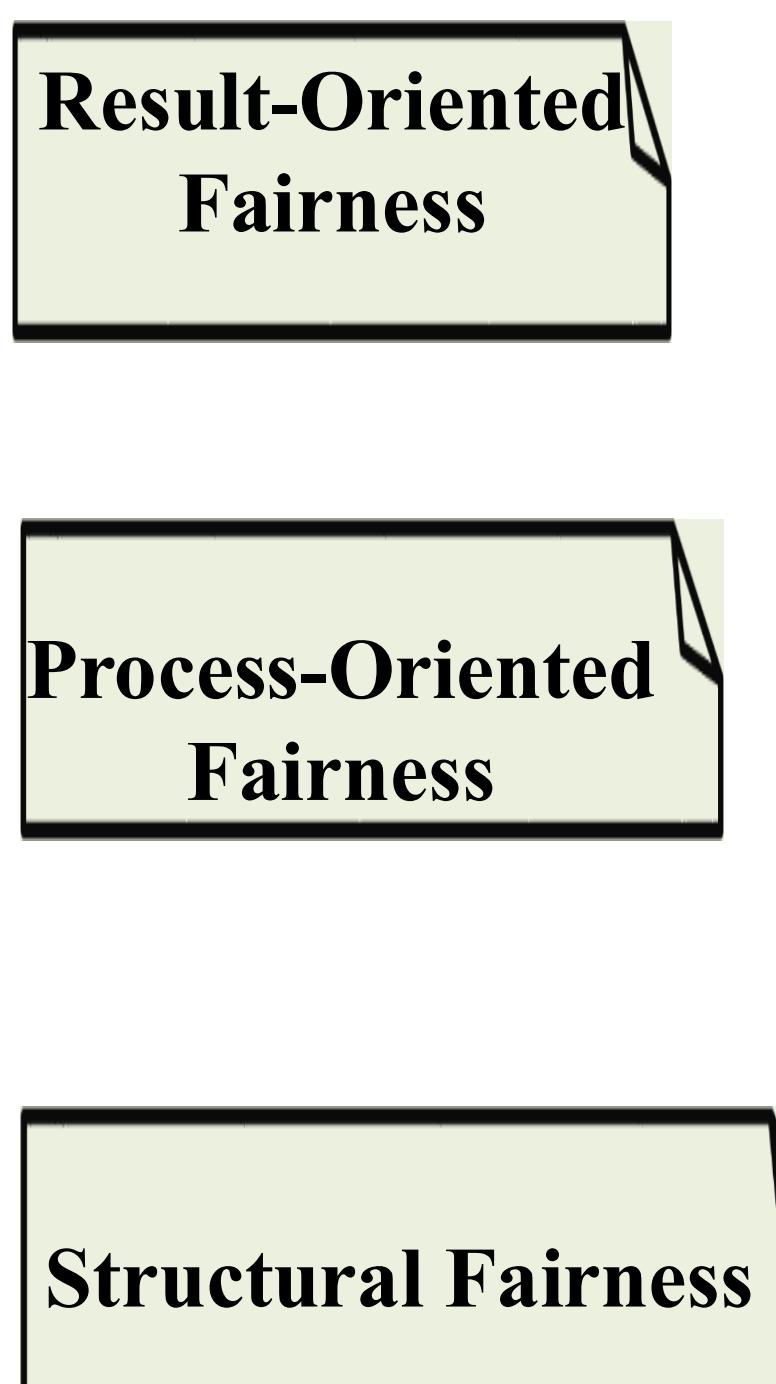
Algorithmic administrative discretion operates through a cyclical mechanism composed of three interrelated flows: information flow, decision flow, and feedback flow. Information flow transforms existing data into legally relevant information through data-driven cognition, shaping the factual basis of discretion and embedding value judgments in data representation. Decision flow constitutes the core of discretionary practice, where algorithmic reasoning interacts with human judgment through advisory, co-decisional, or fully automated modes, determining how outcomes are generated and legitimized. Feedback flow ensures adaptability and accountability by linking decision outcomes to institutional review, correction, and learning mechanisms. Together, these flows form a recursive cycle in which data, models, and human institutions continuously interact, illustrating algorithmic discretion as a dynamic form of digital governance rather than a linear or purely technical process.

The Connotation and Normative Realization of Fairness Values :

1. The Meaning of Algorithmic Fairness Values

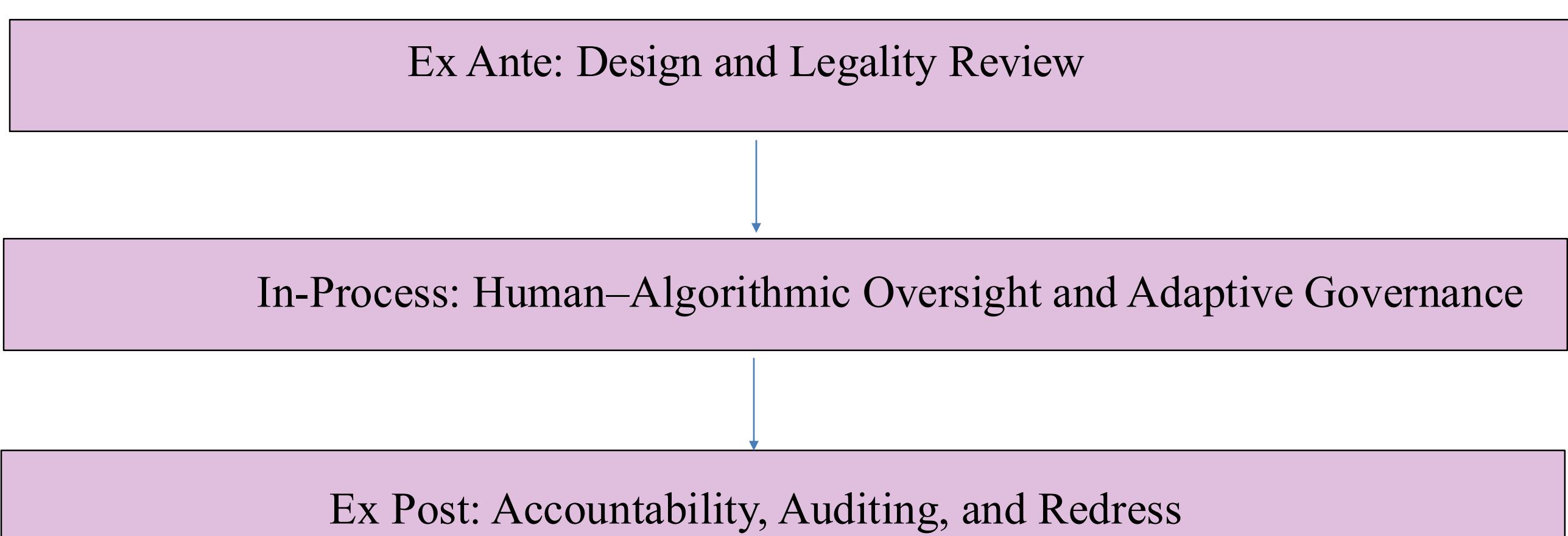
Algorithmic fairness can be understood as the normative extension of traditional administrative fairness into the context of data-driven governance. When administrative discretion is mediated by algorithmic systems, fairness no longer depends solely on the judgment of human officials, but on how data, models, and institutional processes are designed and operationalized. In this sense, algorithmic fairness is not a purely technical notion, but a normative construct concerned with the justice of both outcomes and procedures. It requires translating classical dimensions of administrative fairness into forms that are computable, auditable, and legally meaningful.

2. The Typology of Algorithmic Fairness Values



Result-oriented fairness concerns whether algorithmic decisions produce equal and proportionate outcomes for similarly situated administrative addressees, preventing discrimination and inconsistency in decision results. Process-oriented fairness focuses on the procedural legitimacy of algorithmic decision-making, requiring transparency, explainability, and opportunities for participation or review even when discretion is exercised through automated workflows. Structural fairness extends beyond individual decisions to the institutional and infrastructural conditions under which algorithmic discretion operates, emphasizing representative data, responsible model governance, and effective oversight mechanisms. Together, these dimensions show that fairness in algorithmic administrative discretion is not a single criterion, but a layered normative requirement that must be institutionally realized across the algorithmic lifecycle.

3. Normative Realization of Fairness Values: Lifecycle Governance of Algorithmic Systems



The realization of fairness in algorithmic administrative discretion requires institutional embedding across the entire lifecycle of algorithmic administrative systems. While result-oriented, process-oriented, and structural fairness identify the core normative demands placed on algorithmic discretion, these values must be translated into concrete governance mechanisms to be effective. From an administrative law perspective, fairness-oriented governance operates across three stages: ex ante design and legality review, in-process human-algorithmic oversight, and ex post accountability and redress. At the ex ante stage, fairness is embedded through legality checks, data representativeness, and design constraints. During operation, fairness is maintained through human oversight, transparency, and adaptive governance. At the ex post stage, audits, remedies, and institutional learning ensure accountability and correction. Together, this lifecycle approach transforms fairness from an abstract principle into a sustained governance commitment, ensuring that algorithmic discretion remains aligned with legality, accountability, and administrative justice in the digital age.

CONCLUSION :

Algorithmic administrative discretion reconfigures—rather than replaces—human discretion by redistributing administrative judgment across data, models, and institutional oversight. Its legitimacy depends on whether fairness is embedded throughout the algorithmic lifecycle, from design to accountability. When fairness functions as a governance norm rather than a post hoc constraint, algorithmic discretion can enhance efficiency without undermining legality, equality, or procedural justice.

References

1. Coglianese, C., and Lehr, D. 2017. Regulating by Robot: Administrative Decision Making in the Machine-Learning Era. *Georgetown Law Journal*, 105: 1147–1223. All Faculty Scholarship, Paper 1734. revealed by a transcriptome analysis using a custom microarray. https://digitalcommons.gmu.edu/faculty_pubs/1734
2. Covilla, J. C. 2025. Artificial Intelligence and Administrative Discretion: Exploring Adaptations and Boundaries. *European Journal of Risk Regulation*, 16(1): 36–50.
3. Henderson, P., and Krass, M. 2023. Algorithmic Rulemaking vs. Algorithmic Guidance. *Harvard Journal of Law & Technology*, 37(1). Princeton University Program in Law & Public Affairs Research Paper.
4. Kasy, M.; and Abebe, R. 2021. Fairness, Equality, and Power in Algorithmic Decision-Making. In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency, FAT* '21, 576–586. New York, NY, USA: Association for Computing Machinery. ISBN9781450383097
5. Kennedy, R. 2020. The Rule of Law and Algorithmic Governance, 209–232. Cambridge Law Handbooks. Cambridge: Cambridge University Press.
6. Luca Oneto, S. C. 2020. Fairness in Machine Learning. arXiv:2012.15816.
7. Roehl, U. B. 2023. Automated decision-making and good administration: Views from inside the government machinery. *Government Information Quarterly*, 40(4): 101864.
8. Selbst, A. D.; Boyd, S. A.; Venkatasubramanian, S.; and Vertesi, J. 2019. Fairness and Abstraction in Sociotechnical Systems. In Proceedings of the Conference on Fairness, Accountability, and Transparency, FAT* '19, 59–68. New York, NY, USA: Association for Computing Machinery. ISBN 9781450361255.

