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Lex Programmata and Pancasila Algorithmic Justice: Reconstructing Legal Ontology in the Age of Artificial Intelligence

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ABSTRACT

The digital transformation has shifted the ontological foundation of law from lex scripta to lex programmata, where norms are written in code and autonomously executed by artificial intelligence systems. This shift creates an ontological crisis, as law no longer operates as textual authority interpreted by humans but as computational authority that is self-executing and opaque. This study aims to formulate a reconstruction of Indonesian legal ontology through the paradigm of Pancasila Algorithmic Justice. Using a juridical-normative method with conceptual and legal philosophy approaches, this research reveals three key findings. First, lex programmata is characterized as executable, atemporal, and non-discursive, thereby reducing the interpretive space essential to the due process of law. Second, Pancasila Algorithmic Justice must be positioned as meta-rules binding the entire lifecycle of algorithms, from design to deployment, to ensure alignment with national values. Third, the reconstruction of Indonesia's legal ontology demands a paradigm shift from the rule of law to the rule of code and ethics centered on the five principles of Pancasila. The practical implications of this study include the urgency to establish a Pancasila Regulatory Sandbox and a Sila-based Algorithmic Impact Assessment as instruments of substantive justice in the era of artificial intelligence.

Introduction

The development of artificial intelligence (AI) has transformed not only economic systems, public administration, and financial services, but also the fundamental architecture of law itself. Throughout the history of modern legal thought, law has been understood as *lex scripta*, a system of written norms whose meaning is continuously interpreted, debated, and reconstructed through judicial reasoning and public discourse. Legal validity has traditionally depended upon textual formulation, institutional authority, and procedural legitimacy. In this paradigm, legal norms function as communicative instruments through which society negotiates justice, certainty, and social order.

However, the rapid advancement of artificial intelligence has introduced a new normative reality that increasingly challenges this classical conception of law. Digital technologies now operate not merely as instruments for implementing legal rules but as autonomous systems capable of influencing, directing, and even determining legal outcomes. Algorithmic systems are increasingly utilized in credit scoring, predictive policing, automated administrative decision-making, judicial analytics, and various forms of regulatory technology. In these contexts, legal norms are no longer exclusively interpreted by judges, bureaucrats, or legal professionals; instead, they are translated into executable code and operationalized through computational logic. Lessig (2006) famously anticipated this transformation by arguing that "code is law," emphasizing that software architectures increasingly regulate human behavior in ways previously reserved for legal institutions.

This development signals a fundamental shift from *lex scripta* to what may be described as *lex programmata*. Unlike conventional legal norms that require interpretation before application, algorithmic norms are executed automatically through programmed instructions. Consequently, the normative force of law increasingly resides not in legal texts but in computational systems. Rules are embedded within algorithms, and compliance is often achieved through technological constraints rather than juridical persuasion. The rise of algorithmic governance therefore challenges the traditional understanding of law as a discursive and interpretive enterprise. Legal authority gradually shifts from the courtroom to the computational system, from judicial reasoning to algorithmic processing, and from textual interpretation to data-driven prediction.

The emergence of *lex programmata* raises profound philosophical and jurisprudential concerns. One of the most significant challenges is the phenomenon of ontological displacement, namely the gradual transformation of law from a normative-discursive institution into a computational-operational system. Law has historically functioned as *ratio scripta*, a rational order expressed through language and interpretation. Under algorithmic governance, however, law increasingly becomes *ratio in codice*, a rationality embedded in software architecture and mathematical models. As a result, the classical legal question, "What is the law?" is increasingly replaced by a new question: "How does the algorithm work?" This transformation has substantial implications for legal certainty, due process, accountability, transparency, and democratic legitimacy (Hildebrandt, 2015).

The problem becomes even more complex because algorithmic systems are frequently presented as objective, neutral, and scientifically reliable. In reality, numerous studies demonstrate that algorithms often reproduce social biases, institutional discrimination, and asymmetrical power relations embedded within the data used to train them. Algorithmic decision-making systems may therefore generate outcomes that appear technically rational while simultaneously undermining substantive justice. The opacity of many AI systems, particularly black-box algorithms, further complicates public scrutiny and legal accountability. Consequently, the increasing reliance on computational authority raises

concerns regarding the future of human autonomy, constitutionalism, and democratic governance in the digital era (Pasquale, 2015).

For Indonesia, these developments present a particularly significant challenge. The Indonesian legal system is not merely a collection of positive legal rules but a normative order founded upon Pancasila as the philosophical basis of the state. Pancasila embodies fundamental values of divinity, humanity, unity, deliberative democracy, and social justice that function as the ethical foundation of national law. Therefore, legal modernization in Indonesia cannot be understood solely as technological adaptation; it must also involve the preservation of constitutional identity and philosophical coherence (Latif, 2011).

The challenge lies in the fact that most contemporary AI systems are developed within epistemological traditions that prioritize efficiency, optimization, prediction, and statistical rationality. Such approaches tend to assume value neutrality and frequently neglect the ethical, cultural, and philosophical dimensions of law. In contrast, Pancasila jurisprudence emphasizes substantive justice, human dignity, social solidarity, and deliberative decision-making. Consequently, there exists a potential tension between algorithmic rationality and Pancasila-based legal rationality. If algorithmic governance develops without adequate normative safeguards, legal decision-making may become increasingly detached from the philosophical values that constitute Indonesia's constitutional identity.

Despite the growing body of literature on artificial intelligence, legal technology, and algorithmic governance, significant theoretical gaps remain. Existing studies generally focus on issues of privacy protection, data governance, cybersecurity, digital rights, and AI regulation. Other studies examine algorithmic accountability, explainability, and ethical AI frameworks. Nevertheless, limited attention has been devoted to the ontological implications of *lex programmata* for legal theory itself, particularly within the context of Pancasila jurisprudence. Moreover, current scholarship has not adequately developed a normative framework capable of reconciling computational authority with the philosophical values of Pancasila. As a result, the relationship between algorithmic governance, legal ontology, and constitutional identity remains insufficiently explored.

This study addresses these gaps by proposing the concept of Pancasila Algorithmic Justice as a normative and philosophical framework for evaluating algorithmic governance in Indonesia. The concept seeks to reposition Pancasila not merely as a constitutional symbol but as an active normative foundation capable of guiding the design, implementation, and evaluation of algorithmic systems. Through this approach, the study aims to reconstruct the ontology of Indonesian law in a manner that remains adaptive to technological transformation while preserving the fundamental values of justice, humanity, accountability, and democratic legitimacy embedded within Pancasila.

Based on these concerns, this study seeks to answer three research questions. First, what are the ontological characteristics of *lex programmata* and their implications for the doctrine of legality in contemporary legal systems? Second, how can the concept of Pancasila Algorithmic Justice be theoretically constructed as a corrective framework for

computational authority? Third, what model of legal ontological reconstruction can enable Indonesian law to adapt to the era of artificial intelligence while remaining firmly rooted in the philosophical values of Pancasila?

Method

This study employs a prescriptive normative legal research design aimed at formulating legal arguments and developing normative recommendations concerning the reconstruction of Indonesian legal ontology in the era of artificial intelligence. As a normative legal inquiry, the study focuses on legal norms, legal principles, philosophical foundations, and regulatory frameworks rather than empirical observations. The prescriptive nature of the research seeks not only to describe existing legal phenomena but also to formulate an ideal legal framework capable of addressing the challenges posed by algorithmic governance and emerging artificial intelligence technologies.

To achieve these objectives, the study utilizes three complementary approaches. First, a conceptual approach is employed to examine and critically analyze the concept of *lex programmata* as a new form of normative ordering in the age of algorithmic decision-making. Second, a legal-philosophical approach is used to explore the axiological dimensions of Pancasila as the philosophical foundation of the Indonesian legal system and to assess its relevance in responding to the rise of computational authority. Third, a comparative approach is adopted to analyze contemporary AI regulatory frameworks, particularly the European Union Artificial Intelligence Act (Regulation (EU) 2024/1689) and the OECD AI Principles, in order to identify normative standards and governance models that may inform the development of AI regulation within the Indonesian legal context (European Commission, 2024).

The primary legal materials consist of the 1945 Constitution of the Republic of Indonesia, Law Number 11 of 2008 concerning Electronic Information and Transactions as amended by subsequent legislation, and various international soft law instruments related to artificial intelligence ethics and governance. Secondary legal materials are derived from academic books, peer-reviewed journal articles indexed in Scopus and SINTA, scholarly publications in legal philosophy and technology law, as well as reports issued by international organizations concerned with artificial intelligence governance and digital regulation.

The analysis of legal materials is conducted qualitatively through a deductive method. The analytical process begins with the examination of general legal theories and philosophical concepts concerning law, technology, and governance, followed by their application to contemporary challenges arising from artificial intelligence and algorithmic regulation. Through this process, the study develops normative prescriptions aimed at constructing the concept of Pancasila Algorithmic Justice as a theoretical and normative framework for ensuring that the development and implementation of artificial intelligence

remain consistent with the constitutional values, ethical principles, and legal identity of Indonesia.

Results and Discussion

1. The Ontological Crisis: When Code Becomes Law

The rise of artificial intelligence has fundamentally challenged the traditional ontology of law. Modern legal systems have long been grounded in the paradigm of lex scripta, where legal norms are interpreted and applied through human deliberation. A judge examines facts, hears arguments, considers legal principles, and reaches a decision through a process of reasoning. In this framework, law functions not merely as written rules but as a discursive institution that allows interpretation, contestation, and reflection before legal consequences are imposed.

The emergence of algorithmic governance introduces a different normative reality, often referred to as lex programmata. In contrast to conventional legal norms, algorithmic rules are executable, meaning that norm and enforcement are integrated into a single computational process. A command such as "if credit score < 400, reject application" operates automatically without room for discretion, exception, or contextual evaluation. As a result, the temporal space traditionally occupied by legal reasoning is replaced by instantaneous machine execution. Hildebrandt (2015) argues that smart technologies increasingly regulate human behavior by embedding normative commands directly into technological infrastructures, thereby transforming the relationship between law and governance.

A second characteristic of lex programmata is opacity. Many contemporary AI systems, particularly those based on deep learning, function as black boxes whose decision-making processes cannot be fully understood even by their developers. This condition directly conflicts with fundamental principles of due process, transparency, and accountability. Individuals affected by algorithmic decisions often lack access to the reasoning behind those decisions and therefore face difficulties in challenging or appealing them. Pasquale (2015) warns that the expansion of black-box systems creates a new form of invisible power capable of influencing rights and opportunities without adequate public scrutiny.

These developments generate what may be described as an ontological displacement of law. Historically, law has been understood as ratio scripta—reason articulated through language, interpretation, and institutional discourse. Under algorithmic governance, however, law increasingly becomes ratio in codice—reason embedded within software architecture and computational models. Consequently, the classical legal question "What is the law?" is gradually replaced by "How does the algorithm work?" This shift reflects the transfer of normative authority from legal texts and judicial interpretation to data-driven systems and automated decision-making processes.

The implications are particularly significant for the doctrine of legality. The traditional principle of nullum crimen sine lege assumes that legal norms are publicly accessible and understandable. In the era of artificial intelligence, however, legal outcomes may be determined by proprietary algorithms, inaccessible datasets, or opaque computational models. Therefore, legality can no longer be guaranteed solely through the publication of legal texts. It also requires transparency regarding the technological systems that implement

legal authority. For this reason, the doctrine of legality should be expanded into nullum crimen sine codice publico et explicabile—no legal consequence without publicly accessible and explainable code. Such a principle ensures that algorithmic systems affecting rights and freedoms remain subject to transparency, accountability, and democratic oversight in accordance with the fundamental values of the rule of law (Lessig, 2006; Hildebrandt, 2015; Pasquale, 2015).

2. Pancasila Algorithmic Justice as Meta-Rules

Pancasila has long been recognized as the philosophical foundation of the Indonesian legal system and the source of all sources of law. However, the emergence of lex programmata requires a broader interpretation of this role. In the age of algorithmic governance, Pancasila should no longer function solely as the foundation of legal norms but also as the foundation of computational norms. As algorithms increasingly influence public services, financial systems, law enforcement, and administrative decision-making, the values embedded within these systems must remain consistent with the constitutional identity of Indonesia. Therefore, this study proposes the concept of Pancasila Algorithmic Justice, a normative and axiological framework that positions the five principles of Pancasila as both constraints and objective functions in the design, implementation, and evaluation of algorithms affecting citizens' rights and freedoms. This approach is consistent with the principles of Value Sensitive Design, which emphasize the integration of human values into technological systems (Friedman & Hendry, 2019).

Under this framework, each principle of Pancasila provides a normative benchmark for algorithmic governance. The First Principle, Belief in the One and Only God, requires algorithmic accountability, ensuring that public AI systems remain transparent, auditable, and subject to human responsibility. The Second Principle, Just and Civilized Humanity, demands non-discrimination by design, requiring algorithms to undergo fairness testing and bias mitigation processes before deployment. The Third Principle, the Unity of Indonesia, emphasizes data sovereignty, recognizing citizens' data as a strategic national asset that must be protected from excessive dependence on foreign technological jurisdictions. The Fourth Principle, Democracy Guided by Wisdom through Deliberation, requires meaningful human oversight, particularly in decisions involving fundamental rights, so that humans remain decision-makers rather than passive executors of machine outputs. Finally, the Fifth Principle, Social Justice for All Indonesians, promotes equitable access to code and digital literacy, ensuring that algorithmic governance does not create new forms of exclusion or deepen existing social inequalities (Susanto, 2010).

Viewed collectively, these five principles function as meta-rules that guide the ethical and legal development of artificial intelligence. Rather than allowing algorithms to operate solely according to efficiency, prediction, and optimization, Pancasila Algorithmic Justice ensures that technological systems remain aligned with constitutional values, human dignity, democratic accountability, and social justice. In this sense, Pancasila becomes not only the source of legal legitimacy but also the normative foundation for governing code itself, enabling Indonesia to develop a model of algorithmic governance that is technologically

adaptive while remaining faithful to its philosophical identity (Latif, 2011; Friedman & Hendry, 2019).

3. Towards the Rule of Code and Ethics: Reconstructing the Ontology of Law in the Age of Artificial Intelligence

If lex scripta gave rise to the concept of the rule of law, then lex programmata necessitates the emergence of a new paradigm: the rule of code and ethics. This proposition does not imply that code should replace law. Rather, it suggests that law must retain its normative supremacy by ensuring that computational systems operate within ethical and constitutional boundaries. As Lessig (2006) argues, code increasingly functions as a regulatory mechanism that shapes human behavior in ways traditionally performed by legal institutions. Consequently, the challenge for contemporary legal systems is not merely to regulate artificial intelligence but to ensure that algorithmic governance remains subordinate to constitutional values and democratic principles. In the Indonesian context, this requires the reconstruction of legal ontology so that technological innovation develops within the ethical framework of Pancasila rather than according to purely technical or market-driven rationality

This techno-legal reconstruction requires the establishment of three institutional mechanisms. First, a Pancasila Regulatory Sandbox should be created as a controlled testing environment for high-impact algorithms deployed in both public and private sectors. Within this framework, an interdisciplinary ethical board consisting of legal scholars, Pancasila philosophers, data scientists, technologists, and civil society representatives would evaluate algorithmic systems using the five principles of Pancasila Algorithmic Justice as normative benchmarks. Such a mechanism would enable proactive assessment of potential risks related to bias, discrimination, accountability, data sovereignty, and social justice before algorithmic systems are implemented on a large scale. Second, a system of Algorithmic Justice Certification should be introduced. Algorithms that successfully pass the regulatory sandbox would receive certification demonstrating compliance with ethical, legal, and constitutional standards. To strengthen transparency and public trust, certified systems should be accompanied by publicly accessible model cards containing information regarding their objectives, data sources, limitations, and governance safeguards.

Third, Indonesian law should formally recognize a Right to Algorithmic Explanation as an emerging digital right. Individuals affected by automated decisions should have the right to receive meaningful explanations concerning how and why a decision was reached. Such explanations must go beyond technical outputs and provide understandable information regarding the logic, criteria, and data used by the system. This right is essential for preserving due process, transparency, and accountability in the era of algorithmic governance. Without meaningful explanation, citizens risk becoming subjects of opaque computational authority with limited opportunities to challenge decisions affecting their rights and interests. Therefore, the recognition of a Right to Algorithmic Explanation represents a crucial safeguard for maintaining human dignity and constitutional protection within increasingly automated legal and administrative systems.

Taken together, these institutional reforms provide a foundation for a Pancasila-based model of algorithmic governance. They ensure that technological systems remain accountable to ethical principles, constitutional values, and democratic oversight. In this reconstructed legal ontology, code does not replace law; rather, law governs code through the normative framework of Pancasila. The transition from rule of law to rule of code and ethics thus represents not a departure from legal principles but their adaptation to the realities of artificial intelligence and algorithmic decision-making in the digital age (Lessig, 2006; European Commission, 2024; Latif, 2011).

Conclusion

The transition from lex scripta to lex programmata represents an inevitable ontological transformation in the nature of law. It shifts law from a discursive institution based on interpretation, deliberation, and human judgment into an executable system embedded within computational architectures. As algorithmic governance increasingly influences decisions affecting citizens' rights and legal status, Indonesia faces the challenge of ensuring that technological development remains consistent with its constitutional identity. Without an appropriate normative framework, the country risks a form of digital colonialism in which public life is governed by algorithms designed according to foreign values and technological priorities. In response to this challenge, this study proposes Pancasila Algorithmic Justice as a normative paradigm that positions the five principles of Pancasila as ethical constraints and guiding objectives for the design, implementation, and governance of algorithmic systems.

This study argues that the future of Indonesian law should be built upon a synthesis of the rule of code and ethics, in which code remains subordinate to ethical principles and those principles derive their legitimacy from Pancasila. Through this framework, technological innovation can be aligned with constitutional values, human dignity, democratic accountability, national sovereignty, and social justice. Accordingly, the government should formulate a Presidential Regulation on Pancasila-Based Public Algorithm Governance to establish legal standards for public-sector algorithms and create a National Algorithmic Justice Authority as an independent institution responsible for algorithmic certification, auditing, oversight, and the protection of citizens' rights against opaque, discriminatory, or unaccountable automated decision-making systems.

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