

APPLICATION OF ALGORITHM TO GENERAL PRINCIPLES OF GOOD GOVERNMENT IN GOOD GOVERNANCE

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ABSTRACT

The digital transformation of government in Indonesia has encouraged the use of algorithms and artificial intelligence (AI) systems in various stages of state administration, from risk-based licensing (OSS-RBA) and electronic law enforcement to data-driven decision support systems. This development raises fundamental questions regarding the suitability of algorithm implementation with the General Principles of Good Governance (AUPB) as stipulated in Law Number 30 of 2014 concerning Government Administration, which is a derivative of the concept of good governance. This study aims to examine the extent to which the application of algorithms in administrative decision-making aligns with the principles of legal certainty, accuracy, non-abuse of authority, openness, public interest, and good service, and to identify the legal challenges arising from it. The study used a normative juridical method combined with a systematic literature review of 20 scientific sources published between 2021 and 2026. The results of the study indicate that the implementation of algorithms has the potential to strengthen the efficiency, consistency, and objectivity of public services, but at the same time creates new risks in the form of algorithm opacity (black box), systemic bias, accountability gaps, and unclear shifts in legal responsibility between officials, system developers, and government institutions. This study recommends the need for a legal framework that explicitly integrates the principles of explainability, periodic algorithm audits, and human oversight into the substance of the AUPB so that the implementation of algorithms in government remains consistent with the ideals of good governance.

Keywords: Algorithms, General Principles of Good Governance (AUPB), Good Governance, Artificial Intelligence, Algorithmic Accountability.

PENERAPAN ALGORITMA TERHADAP PRINSIP-PRINSIP UMUM PEMERINTAHAN YANG BAIK DALAM TATA KELOLA YANG BAIK

ABSTRAK

Transformasi digital pemerintahan di Indonesia telah mendorong penggunaan algoritma dan sistem kecerdasan buatan (AI) dalam berbagai tahap penyelenggaraan administrasi negara, mulai dari perizinan berbasis risiko (OSS-RBA) dan penegakan hukum elektronik hingga sistem pendukung keputusan berbasis data. Perkembangan ini memunculkan pertanyaan mendasar mengenai kesesuaian penerapan algoritma dengan Asas-Asas Umum Pemerintahan yang Baik (AUPB) sebagaimana diatur dalam Undang-Undang Nomor 30 Tahun 2014 tentang Administrasi Pemerintahan, yang merupakan derivasi dari konsep good governance. Penelitian ini bertujuan untuk mengkaji sejauh mana penerapan algoritma dalam pengambilan keputusan administratif selaras dengan asas kepastian hukum, kecermatan, tidak

menyalahgunakan kewenangan, keterbukaan, kepentingan umum, dan pelayanan yang baik, serta mengidentifikasi tantangan hukum yang muncul akibatnya. Penelitian ini menggunakan metode yuridis normatif yang dipadukan dengan tinjauan literatur sistematis (systematic literature review) terhadap 20 sumber ilmiah yang diterbitkan antara tahun 2021 hingga 2026. Hasil penelitian menunjukkan bahwa penerapan algoritma berpotensi memperkuat efisiensi, konsistensi, dan objektivitas pelayanan publik, namun pada saat yang sama menimbulkan risiko baru berupa opasitas algoritma (black box), bias sistemik, kesenjangan akuntabilitas, serta ketidakjelasan pergeseran tanggung jawab hukum antara pejabat, pengembang sistem, dan lembaga pemerintah. Penelitian ini merekomendasikan perlunya kerangka hukum yang secara eksplisit mengintegrasikan prinsip keterjelasan (explainability), audit algoritma secara berkala, dan pengawasan manusia ke dalam substansi AUPB agar penerapan algoritma dalam pemerintahan tetap konsisten dengan cita-cita good governance.

Kata Kunci: Algoritma, Asas-Asas Umum Pemerintahan yang Baik (AUPB), Tata Kelola Pemerintahan yang Baik, Kecerdasan Buatan, Akuntabilitas Algoritmik.

INTRODUCTION

The development of information and communication technology has brought fundamental changes to the way the state carries out government functions. The digitization of bureaucracy, which in Indonesia is institutionalized through the Electronic-Based Government System (SPBE) based on Presidential Regulation Number 95 of 2018, no longer stops at the stage of simple administrative automation, but has evolved towards the use of algorithms and artificial intelligence systems in the decision-making process (algorithmic decision-making). The Online Single Submission (OSS-RBA) risk-based licensing system, electronic ticketing systems, public service chatbots, and data-driven decision support systems have become an integral part of contemporary governance practices in Indonesia.

The shift from a hierarchical and manual-procedure bureaucracy to data- and algorithm-driven governance carries significant legal consequences. Government administration in Indonesia is subject to Law Number 30 of 2014 concerning Government Administration, which in Article 9 formulates the General Principles of Good Governance (AUPB) as the basis for every action and decision of government officials. The AUPB, historically adapted from the doctrine of *Algemene Beginselen van Behoorlijk Bestuur* in the Dutch administrative law tradition, is a concrete manifestation of the principles of good governance in the Indonesian administrative law system. These principles include, among others, legal certainty, accuracy, non-abuse of authority, openness, public interest, and good service.

The question that arises then is: can the principles designed to evaluate human actions

(government officials) remain relevant and effective when applied to decisions generated, in part or in whole, by algorithmic systems? Recent studies have shown that the use of algorithms in Indonesian government administration does have the potential to strengthen the principles of the Automated Administrative Decisions (AUPB) by increasing the consistency and speed of service delivery, but also presents new challenges in the form of risks of digital maladministration, lack of algorithmic transparency, technological gaps, and data security threats (Siaran Berita, 2025). The complexity of black-box-based algorithms, especially in the latest generation of artificial intelligence systems, can hinder citizens' ability to understand and challenge decisions that affect their rights, potentially undermining the principles of transparency and accountability that are at the heart of the AUPB (Automated Administrative Decisions Study, 2025).

This phenomenon is increasingly relevant given the increasing penetration of Indonesia's digital economy, with a projected value of around US\$360 billion by 2030, and the high level of public concern about the potential misuse of artificial intelligence (AI Regulatory Reformulation, 2025). Furthermore, Indonesia's regulatory framework for algorithmic governance and artificial intelligence in the public sector remains fragmented and reactive, dominated by a sectoral approach rather than a holistic approach that explicitly integrates algorithmic ethics principles into state administrative law (Berajah Journal, 2026). This legal vacuum creates uncertainty regarding the legal status of decisions made by automated systems, who is responsible when algorithms result in harm to citizens, and how classical principles of state administrative law should be reinterpreted in the context of algorithmic governance.

Based on this background, this study aims to: (1) examine the conceptual framework of the relationship between algorithms, AUPB, and good governance; (2) map the legal basis governing the application of algorithms in government administration in Indonesia; (3) analyze the suitability of AUPB principles with the characteristics of algorithm-based decision-making systems; (4) identify legal challenges to implementation, including issues of accountability and transparency; (5) explore international practices for comparison; and (6) formulate recommendations for a legal framework that is more responsive to the development of algorithmic governance in government. By synthesizing the literature on state administrative law, government science, and technology studies, this study is expected to contribute to academic and policy discourse regarding optimizing the role of algorithms in realizing good governance in the digital era.

RESEARCH METHODS

This research employs a normative legal approach combined with a systematic literature review (SLR) method. The normative legal method is used to systematically analyze primary legal materials, including laws and regulations, state administrative court decisions, and government policies governing the implementation of government administration and the use of algorithmic technology in the public sector (Diantha, 2023, within the methodological framework of normative legal research). The literature review component is used to synthesize secondary sources to identify patterns, academic debates, and research gaps in the study of algorithmic governance in Indonesia.

Legal sources were collected through searches of online academic databases, including Google Scholar, ResearchGate, and national e-journal portals, using keywords such as 'application of the AUPB algorithm', 'automated administrative decision Indonesia', 'algorithmic governance of government', 'artificial intelligence good governance', and 'public sector algorithm accountability', with a focus on publications from 2021 to 2026. Primary legal materials analyzed included Law Number 30 of 2014 concerning Government Administration, Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems, Law Number 27 of 2022 concerning Personal Data Protection, Circular Letter of the Minister of Communication and Information Technology Number 9 of 2023 concerning Artificial Intelligence Ethics, and the Indonesian National Strategy for Artificial Intelligence 2020-2045.

The inclusion criteria for the literature used were: (a) accredited scientific journal articles or law books published between 2021 and 2026; (b) normative or empirical studies discussing the relationship between state administrative law, the AUPB, and algorithmic technology or artificial intelligence; (c) comparative legal studies involving Indonesia; and (d) policy analyses related to the implementation of digital systems in the government sector. Material was excluded if it was outdated (before 2021, unless it was fundamental to AUPB doctrine), not available in full text, or irrelevant to the administrative law dimension of algorithmic governance. A total of 20 sources that met the inclusion criteria were analyzed through content analysis to identify key themes, relevant legal provisions, implementation challenges, and recommended solutions offered by each literature.

RESULTS AND DISCUSSION

3.1 Conceptual Framework: AUPB and Algorithmic Governance

The General Principles of Good Governance (AUPB) are the principles or principles that serve as the basis for government administrators in carrying out public affairs within their authority (Octavia, 2021). Historically, AUPB is rooted in the doctrine of Algemene Beginselen van Behoorlijk Bestuur which was later adopted and formalized into the Indonesian positive legal system, initially through state administrative court jurisprudence and then explicitly codified in Law Number 30 of 2014 concerning State Administration. In the context of Indonesian state administration and administration, AUPB is essentially a direct equivalent of the concept of 'General Principles of Good Governance', so that its functional application is the operationalization of good governance principles in every state administrative action.

Good governance itself, according to experts, is defined as a procedure for managing resources by a large organization called the state that aims to empower the community and support responsible political development (Wutsqah & Erwianti, 2025). Based on Government Regulation Number 101 of 2000, good governance is defined as a government that implements and develops the principles of professionalism, accountability, transparency, excellent service, democracy, efficiency, effectiveness, and the rule of law (PANDITA, 2025). When these principles are operationalized through an algorithmic system, a new concept emerges which in the international literature is referred to as 'algorithmic governance' or algorithmic governance, namely an automated decision-making system based on algorithms as one of the important layers in the digital government architecture, in addition to the digital public infrastructure layer, data for policy, and GovTech (Politica, 2025).

A relevant theoretical framework for understanding the relationship between algorithms and AUPB is Principal-Agent Theory, which views the use of algorithms in the government sector as a form of delegation of some decision-making authority from humans (government officials) to machines (Politica, 2025). This delegation does not eliminate the principal's responsibility, but changes the form of oversight required to ensure that the agent (in this case the algorithmic system) continues to act in accordance with the interests and legal constraints set by the principal. Within the framework of state administrative law, this means that even though decisions are generated by algorithms, substantive responsibility remains with the government officials or institutions that use them, as emphasized by the principle that every state administrative action, whether manual or electronic, must remain subject to the principle of

legal protection for citizens (OSS-RBA Study, 2025).

Thus, conceptually, the application of algorithms in government is not an entirely new area of law, but rather an expansion of the application of AUPB into the realm of technology. The challenge lies in how to translate the principles originally formulated to evaluate human judgment and discretion so that they can still be meaningfully applied to decision-making processes that are probabilistic, data-driven, and in many cases non-interpretable, even to their designers.

3.2 Legal Basis for the Application of Algorithms in Indonesian Government Administration

Law Number 30 of 2014 concerning State Administration is the primary legal basis governing administrative decisions in Indonesia, with the aim of ensuring that every administrative decision is in line with the Automated Administrative Decisions (AUPB). Article 9 of this law details the AUPB, including the principles of legal certainty, benefit, impartiality, accuracy, non-abuse of authority, transparency, public interest, and good service (Automated Administrative Decisions Study, 2025). These provisions serve as normative benchmarks that apply regardless of the means or technology used to produce the decision, including when the decision is produced through an electronic system or algorithm.

The second foundation is Presidential Regulation Number 95 of 2018 concerning the Electronic-Based Government System (SPBE), which serves as the policy umbrella for the digitalization of all government administration processes, including the development of automated and data-driven systems in public services (News Release, 2025). SPBE encourages inter-agency system integration and data interoperability, which are technical prerequisites for the functioning of cross-sector decision-making algorithms, such as the risk-based business licensing system (OSS-RBA).

Third, in terms of data protection, which is the primary input for algorithms, Law Number 27 of 2022 concerning Personal Data Protection provides a legal framework for the processing of personal data by government agencies, including data used to train or operate algorithmic systems. However, this provision does not explicitly address the substance of automated decision-making or the potential discrimination that can arise from artificial intelligence systems. Other technical regulations, such as Regulation of the Minister of Communication and Informatics Number 3 of 2021, primarily address licensing and technical standards for the

implementation of electronic systems, rather than the substance of algorithmic ethics (AI Regulation Reformulation, 2025).

Fourth, Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 has introduced ethical principles of artificial intelligence, but because it is in the form of a circular, the provisions are not legally binding and do not have coercive power in the form of sanctions (AI Regulation Reformulation, 2025). Meanwhile, the Indonesian National Strategy for Artificial Intelligence 2020-2045 establishes four strategic directions for the use of artificial intelligence, namely human development and mastery of science and technology, sustainable economic development, equitable development, and strengthening national resilience and governance (Wutsqah & Erwianti, 2025); however, this document essentially functions as a guide to policy direction, not as a binding and enforceable legal norm.

This situation indicates a significant legal vacuum in the regulation of algorithms in the Indonesian public sector, particularly regarding accountability mechanisms when algorithmic systems cause harm or violate citizens' rights. A doctrinal study of digital regulations in the administrative sector found that most existing regulations do not explain digital data verification mechanisms, do not regulate the transparency of algorithms or automated decision-making processes, and do not provide a specific objection mechanism for decisions made by digital systems (Wicaksono et al., 2026). This normative gap underscores the urgency of formulating a legal framework that specifically regulates the relationship between algorithms and AUPB, rather than simply relying on extensive interpretations of provisions of state administrative law formulated before the algorithmic era.

3.3 Compatibility of AUPB Principles with Algorithm-Based Decision-Making Systems

An analysis of the reviewed literature shows that each principle in the AUPB presents varying degrees of suitability and challenges when applied to algorithmic systems. First, the principle of legal certainty, which aims to ensure that all government administrative actions and decisions have a clear, logical, and non-interpretive legal basis (Ritonga & Fitri, 2024), can be strengthened by algorithms because a programmed system will consistently apply the same criteria to every similar case, theoretically reducing unwarranted variation in decisions. However, legal certainty can be compromised if the criteria used by the algorithm are not adequately publicized, preventing citizens from knowing the exact legal basis and logic used in making decisions that affect them.

Second, the principle of accuracy, which requires the government to be careful in compiling, analyzing, and making decisions by considering all relevant aspects before making a decision, faces fundamental tension with the characteristics of algorithms, especially machine learning-based artificial intelligence systems that work probabilistically. A study of the implementation of the OSS-RBA system found that in practice, obstacles often arise in the form of unreadable data, disruptions in inter-agency integration, or verification results that do not correspond to the facts on the ground, so that the corrective function of the principle of accuracy and the principle of not abusing authority is very important to prevent technical officials from hiding behind the pretext of 'system errors' alone (Majelis: Jurnal Hukum Indonesia, 2025).

Third, the principle of not abusing authority faces a new problem in the form of the phenomenon of 'automation bias', namely the tendency of government officials to excessively trust the output of algorithmic systems without conducting critical reviews, so that substantively the responsibility for decision-making shifts from humans to machines without being accompanied by an adequate legal accountability framework for this shift (ARJUNA Journal, 2025). This phenomenon is referred to by some literature as 'phantom responsibility', namely a condition in which legal responsibility becomes blurred because it is distributed among officials who rely on the system, algorithm developers, and government institutions as a whole, without any one party being clearly held fully accountable.

Fourth, the principle of openness faces the most fundamental challenge of the complexity of black-box-based algorithms, which can technically hinder the ability of citizens and government officials themselves to understand the basis of an automated decision (Automated Administrative Decisions Study, 2025). Doctrinal studies have found that most existing digital regulations do not adequately regulate the obligation of algorithm transparency, so that the principle of openness, which was originally interpreted as the obligation to provide access to information to the public, needs to be expanded to include the obligation of 'explainability', namely the government's obligation to explain the logic and variables used by the algorithmic system in producing an administrative decision (Wicaksono et al., 2026).

Fifth, the principles of public interest and good service are essentially the primary goals to be achieved through the digitization and automation of public services. Studies on the integration of artificial intelligence in government show that algorithms can improve the efficiency and ease of access to services for citizens, including in disaster management and emergency response, where algorithms help the government make quick and effective decisions based on

accurate data analysis (Ramadian et al., 2025). However, these benefits can only be optimally realized if balanced with mitigation measures against the risk of the digital divide, which has the potential to exclude certain groups of people, especially those with limited digital literacy, from accessing algorithmized services.

Overall, the results of this analysis confirm that AUPB is essentially still relevant and applicable to algorithmic systems, but the substance of its meaning needs to be reconstructed contextually in order to be able to reach the unique characteristics of algorithmic technology, especially regarding the opacity of the process, the probabilistic nature of the system's output, and the distribution of responsibility among the various actors involved in the chain of production and use of the technology.

3.4 Implementation Challenges: Transparency, Accountability, and Automated Decision-Making

One of the most fundamental issues in digital administrative law is the legal status of decisions issued entirely by algorithms without human intervention (zero-touch), such as electronic ticketing systems or automated permit approvals in principle (Joecy, 2025). The crucial question that arises is whether the output of such automated systems can be categorized as State Administrative Decisions (KTUN) that can be challenged through the state administrative court mechanism. An analysis of the elements of KTUN shows that automatic output that is final, binding, and determines the rights or obligations of the applicant can in principle still be categorized as KTUN as long as it meets the elements of being issued by a government organ, is concrete and individual, and meets the written/electronic elements, even without the wet signature of an authorized official.

However, in practice, arguments often arise that attempt to absolve legal responsibility, claiming that automated system outputs are "not official decisions, but merely system outputs," and therefore cannot be challenged. This type of argument clearly contradicts the principle of legal protection for citizens and has the potential to create loopholes for administrative impunity. When decisions are made by automated systems, accountability mechanisms become distributed and potentially create accountability gaps if not explicitly regulated within the framework of state administrative law (Wicaksono et al., 2026). Findings from a doctrinal study of digital regulations reveal worrying data: most regulations do not explain digital data verification mechanisms, the majority do not regulate the transparency of algorithms or

automated decision-making processes, and all regulations analyzed do not provide a specific objection mechanism for digital decisions (Wicaksono et al., 2026).

The accountability challenge becomes more complex when algorithmic decisions cause harm to citizens, as it involves the question of who should be held accountable: the officials relying on the AI system, the algorithm developers, or the government institution as a whole (Berajah Journal, 2026). This complexity is exacerbated by the phenomenon of deskilling and excessive reliance on algorithmic systems among government officials, which poses a fundamental challenge to conventional legal accountability principles (ARJUNA Journal, 2025). To address this issue, several studies have proposed a hybrid legal framework that integrates the concept of limited legal personality for artificial intelligence systems with the principle of human oversight as a fundamental principle, accompanied by revisions to the law on information and electronic transactions and the formulation of specific regulations for artificial intelligence that adopt a risk-based classification approach as applied in the European Union regulatory framework (ARJUNA Journal, 2025).

As an operational solution, a study on the reconstruction of digital administrative law recommends that the object of administrative law be expanded to include systemic processes that produce decisions, including algorithm design, automated validation mechanisms, and data interoperability, accompanied by concrete normative obligations in the form of periodic algorithm audits, administrative explainability obligations, the storage of system logs as evidence, and the establishment of an integrated electronic complaint channel (Wicaksono et al., 2026). This approach shifts the regulatory focus from merely identifying risks to designing operational corrective mechanisms that can be implemented concretely within the state administrative law system.

3.5 The Tension between Algorithmic Efficiency and the Protection of Citizens' Constitutional Rights

The use of algorithms and artificial intelligence by the government has the potential to impact various constitutional rights of citizens, including the right to personal data protection guaranteed in Article 28G paragraph (1) of the 1945 Constitution of the Republic of Indonesia, as well as the right to justice and equal treatment before the law (POLITICS OF LAW, in Berajah Journal, 2026). This tension becomes increasingly apparent considering the characteristics of algorithms that can produce systemic bias when the training data used is not

representative of the diversity of the population, thus potentially giving rise to hidden discrimination in public services, for example in the selection process for social assistance recipients, credit risk assessments in government microfinance programs, or risk profiles in risk-based licensing systems.

International practice provides valuable lessons regarding this risk. In the European context, for example, the European Court of Human Rights' ruling in the case of *Satakunnan Markkinapörssi Oy and Satamedia Oy v. Finland* emphasized the importance of protecting the right to privacy against the disproportionate use of personal data by systems engaged in large-scale data processing (Automated Administrative Decisions Study, 2025). This principle is relevant in the Indonesian context, where the use of citizen population and socio-economic data in government algorithmic systems is increasingly widespread without an adequate independent oversight framework for potential abuse or resulting systemic bias.

The tension between algorithmic efficiency and the protection of citizens' rights ultimately leads to the need to balance two equally legitimate interests: on the one hand, the state's interest in providing fast, consistent, and resource-efficient public services through automation; and on the other hand, the individual's interest in receiving fair, explainable, and contestable treatment if algorithmic decisions harm their rights. The principle of proportionality, long an integral part of the AUPB doctrine, can serve as a normative instrument for measuring this balance, by requiring that the degree of automation of a decision be proportional to the magnitude of its impact on the rights and interests of the citizen concerned.

3.6 Comparative Perspective: International Practices of Algorithmic Governance in the Public Sector

Comparisons with international practices show that Indonesia is not the only country facing challenges in integrating algorithms into the legal framework of state administration. The Organisation for Economic Co-operation and Development (OECD) recorded at least 262 initiatives using artificial intelligence by local governments spread across 170 cities and regions in various countries, reflecting the global trend towards the automation of government services (cited in J-Multitechno, 2025). The European Union has developed a risk classification-based regulatory approach through the framework of the Artificial Intelligence Act, which categorizes artificial intelligence systems based on their level of risk to human rights, with systems used in essential public services---such as law enforcement and population administration---

categorized as high-risk systems subject to stricter transparency obligations and human oversight (Jurnal ARJUNA, 2025).

This approach differs from countries that rely more on sectoral legal frameworks without specific regulations on artificial intelligence, as is currently the case in Indonesia, resulting in legal loopholes, particularly regarding algorithm audit mechanisms, ethical responsibility, and the protection of public rights from potential abuse of government algorithmic systems (AI Regulatory Reformulation, 2025). This comparison confirms that the risk-based classification approach, which requires varying levels of oversight and transparency obligations according to the level of risk an algorithmic system poses to citizens' rights, is a model worthy of consideration as a direction for AI regulatory reform in the Indonesian public sector.

Furthermore, global trends also indicate a shift from an approach solely oriented towards technical efficiency towards an approach oriented towards responsible governance, which emphasizes the alignment and integration between layers of artificial intelligence systems in digital government, including the digital public infrastructure layer, the data layer for policy, the algorithmic governance layer, and the GovTech layer, so that artificial intelligence systems in government can function effectively and provide significant impact without sacrificing the principles of good governance (Politica, 2025). Lessons learned from these international practices are relevant to be contextually adapted to Indonesia's institutional capacity and socio-technological conditions, rather than being adopted raw without adjustment.

3.7 The Principle of Prudence and Human Oversight as Complements to the Implementation of Algorithms in AUPB

Given the various challenges outlined, a number of literatures emphasize that the implementation of algorithms in government cannot be separated from the precautionary principle and the necessity of maintaining human oversight as a complementary element, not an alternative, to automation. Studies on the readiness of government human resources in adopting artificial intelligence indicate that the readiness factor of state civil servants, which is often still inadequate, is one of the determining variables for the successful integration of algorithms in government without sacrificing the quality of substantive oversight of the decisions produced by the system (Ramadian et al., 2025).

The development and implementation of artificial intelligence in local government can no longer be viewed as an optional option, but rather has become an urgent need that requires

institutional commitment, technology investment, and continuous strengthening of apparatus capacity (J-Multitechno, 2025). However, strengthening this technological capacity must go hand in hand with strengthening the legal and ethical capacity of apparatus in critically evaluating the output of algorithmic systems, so as not to fall into the trap of automation bias that ultimately erodes, rather than strengthens, the principles of accuracy and non-abuse of authority in the AUPB.

As concrete steps, several studies recommend that the government develop legal standards specifically governing automated decisions and the use of artificial intelligence, increase the digital capacity of state civil servants, strengthen data security guarantees, add accountability mechanisms for digital systems, and ensure that all digital systems comply with the AUPB substantially, not just formally and procedurally (Siaran Berita, 2025). This recommendation aligns with the proposed creation of a special law on artificial intelligence that integrates the principles of algorithm ethics, fundamental rights protection, and a holistic oversight mechanism, rather than the fragmented and sectoral nature of current regulations (Berajah Journal, 2026).

Ultimately, the principles of prudence and human oversight must be understood not as obstacles to technological innovation in government, but rather as prerequisites for the legitimacy of the implementation of algorithms themselves. As emphasized in the study on government administrative responsibility in the digital era, technology does not eliminate the government's substantive obligations, but rather expands the form of responsibility for new administrative risks arising from digitalization, so that every state administrative action, whether carried out manually or facilitated by electronic systems and algorithms, must remain subject to the principles of legal certainty, accuracy, professionalism, and accountability inherent in every administrative action (OSS-RBA Study, 2025).

CONCLUSION

This systematic literature review shows that the application of algorithms in governance in Indonesia has significant potential to strengthen the principles of good governance as manifested in the General Principles of Good Governance (AUPB), particularly through increasing the consistency, speed, and objectivity of public services. However, this potential has not been optimally realized because there is still a significant normative gap between the development of algorithmic technology and the readiness of the legal framework for state

administration, particularly regarding algorithm opacity (black box), the risk of systemic bias, accountability gaps, and the ambiguity of legal responsibilities among government officials, system developers, and government institutions.

The analyzed evidence shows that an approach based purely on technological optimism, without explicit strengthening of the legal framework, is inadequate to ensure that the application of algorithms in government remains consistent with the ideals of good governance. The application of algorithms in line with the AUPB requires an integrated strategy that includes: (1) reconstruction of the substantive meaning of the AUPB principles, particularly the principle of openness that needs to be expanded to include the obligation of algorithmic explainability, and the principle of accuracy that needs to be strengthened with the obligation of periodic algorithm audits; (2) the establishment of a specific legal framework regarding artificial intelligence in the public sector that adopts a risk-based classification approach; (3) strengthening accountability mechanisms through the obligation to store system logs as evidence and the establishment of an integrated electronic complaint channel; (4) continuous improvement of the digital capacity and ethics of state civil servants; and (5) affirmation of the principle of human oversight as a prerequisite for the legitimacy of every administrative decision generated or assisted by algorithmic systems.

Future research should focus on empirically evaluating the effectiveness of AUPB implementation in operational algorithmic systems, such as the OSS-RBA system and the electronic ticketing system, to gain a more concrete understanding of the gap between norms and practice. Furthermore, a more in-depth comparative study of the risk-based regulatory model as implemented in the European Union, as well as a study of the interaction between generative artificial intelligence and the principles of state administrative law, constitutes an urgent research agenda that needs to be further developed in line with the acceleration of the digital transformation of government in Indonesia.

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