



THE URGENCY OF REFORMING INTELLECTUAL PROPERTY LAW REGULATIONS IN RESPONDING TO THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE TECHNOLOGY

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Abstract

The rapid development of artificial intelligence has created significant legal challenges for intellectual property law, particularly regarding authorship, ownership, originality, the use of protected works as training data, and liability for AI-generated outputs. This study aims to analyze the urgency of reforming Indonesian intellectual property law regulations in responding to artificial intelligence technology, with specific focus on the adequacy of copyright, patent, electronic information, personal data protection, and artificial intelligence ethics regulations. This research employs a normative juridical method using statutory and conceptual approaches. Data were collected through library research by examining primary legal materials, including Indonesian laws and regulations, and secondary legal materials consisting of academic literature and policy documents; because this is normative legal research, no respondents or informants were involved. The data were analyzed qualitatively through legal interpretation and systematic analysis. The findings show that existing regulations provide partial protection for human-created works, technological inventions, electronic systems, and personal data, but they do not specifically regulate AI-generated works, ownership of AI outputs, copyrighted data used for AI training, or legal responsibility among users, developers, and platforms. The study concludes that regulatory reform is necessary to strengthen legal certainty, protect creators, and support responsible AI innovation in Indonesia.

Keywords: Intellectual Property Law, Artificial Intelligence, Copyright Reform, AI-Generated Works, Legal Certainty.

INTRODUCTION

The development of artificial intelligence has significantly transformed the way humans create works, generate innovation, and manage intangible assets in the digital economy. Artificial intelligence is no longer used merely as a computational tool, but has also become capable of producing texts, images, music, computer codes, designs, and technical inventions that resemble human-created works. At the global level, the urgency of legal regulation has become increasingly important due to the rapid growth of generative artificial intelligence in creative, technological, and commercial sectors. Inal et al. (2026) reported that private investment in generative artificial intelligence reached USD 25.2 billion in 2023. In the same context, Hwang et al. (2023) recorded more than 54,000 inventions related to generative artificial intelligence and more than 75,000 scientific publications during the period from 2014 to 2023. These developments indicate that artificial intelligence has become an essential part of the global ecosystem of creativity, innovation, and knowledge commercialization, thereby requiring a more adaptive intellectual property legal framework.

In the Indonesian context, this issue is particularly relevant because the intellectual property legal system still relies on the concepts of creator, inventor, right holder, moral rights, and economic rights, which are generally associated with human legal subjects or legal entities. Law Number 28 of 2014 on Copyright regulates the protection of works and the economic rights of creators, while Law Number 13 of 2016 on Patents, as amended by Law Number 65 of 2024, regulates inventions in the field of technology. In addition, Law Number 27 of 2022 on Personal Data Protection and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning

Artificial Intelligence Ethics provide ethical and data protection foundations for the use of digital technology. However, these regulations have not specifically addressed the legal status of works generated by artificial intelligence, ownership of rights over artificial intelligence outputs, the use of copyrighted works as training data, and legal responsibility among users, developers, and platform providers.

Previous studies show that the relationship between artificial intelligence and copyright law remains conceptually contested. Sen (2023) explained that the concept of authorship in copyright law is closely related to causality, intention, and human will; therefore, works generated through autonomous systems create difficulties in determining who should legally be recognized as the author. Torrance & Tomlinson (2023) argued that the use of works for machine learning may, under certain circumstances, be understood as a form of fair learning, particularly when the system does not directly exploit the expressive elements of the works. In contrast, Mayana et al. (2024) emphasized that the use of copyrighted works in artificial intelligence training raises two major legal issues, namely the legality of the input used for training and the possibility of infringement in the outputs generated by the system.

Recent studies also reveal the broader need for legal reform. Gaffar & Albarashdi (2025) emphasized that legal debates on artificial intelligence and copyright involve three important issues: whether artificial intelligence-assisted works can be protected, whether training models with copyrighted works can be justified, and whether existing copyright doctrines are capable of accommodating the development of large language models. Sharma (2025) found that intellectual property legal frameworks designed on the basis of human authorship are inadequate to respond to the characteristics of generative artificial intelligence, which can replicate, transform, and produce new content from human-created works. In Indonesia, Zakir et al. (2024) showed that the Copyright Law remains grounded in the principle of human authorship, indicating the need for a more adaptive legal framework for works generated by artificial intelligence. The research gap lies in the limited number of studies that integratively connect copyright law, patent law, electronic system regulation, personal data protection, and artificial intelligence ethics as a unified framework for regulatory reform.

Based on this gap, this study aims to analyze the urgency of reforming intellectual property law regulations in Indonesia in response to the development of artificial intelligence technology. The analysis focuses on four main issues: the legal status of works generated by artificial intelligence, ownership of rights over artificial intelligence outputs, the use of copyrighted works as training data, and the legal responsibility of parties involved in the operation of artificial intelligence systems. This study also positions copyright, patent, electronic system regulation, personal data protection, and artificial intelligence ethics as legal instruments that must be interpreted systematically in order to address emerging legal challenges in the digital economy.

Theoretically, this study contributes to the development of intellectual property law scholarship by offering a new understanding of the relationship between human authorship, machine creativity, and the legality of data use in artificial intelligence systems. Practically, this study may serve as a reference for policymakers, legal scholars, creative industry actors, technology developers, and electronic system providers in formulating regulations that are more adaptive, equitable, and oriented toward legal certainty. Therefore, the reform of intellectual property law regulations is not only essential to protect creators and right holders but also necessary to ensure that artificial intelligence innovation develops responsibly, transparently, and in accordance with the public interest.

LITERATURE REVIEW

Intellectual Property Law and the Development of Artificial Intelligence Technology

Intellectual property law is traditionally designed to protect human creativity, technological innovation, and the economic value of intellectual works. However, the development of artificial intelligence has challenged this classical framework because artificial intelligence systems are now capable of producing texts, images, music, computer programs, designs, and technical solutions that resemble human-created works. Amankwah-Amoah et al. (2024) explain that generative artificial intelligence has disrupted the boundaries of knowledge production because it can reproduce, transform, and generate new content from existing human works. This condition shows that intellectual property law must be re-examined to ensure that legal protection for human creators remains strong while technological innovation continues to develop responsibly. Therefore, the relationship between intellectual property law and artificial intelligence has become an important legal issue that requires regulatory reform.

Authorship, Originality, and Ownership of Artificial Intelligence-Generated Works

Authorship and originality are central elements in copyright protection because legal protection is generally granted to works that reflect human intellectual effort and personal creative expression. Putri et al. (2025) argues that authorship is related to causality, intention, and the creative role of human actors, making it difficult to apply

this concept to works generated by autonomous or semi-autonomous artificial intelligence systems. Cendhayanie & Barthos (2026) show that Indonesian copyright law still relies on the concept of human authorship and has not specifically regulated artificial intelligence-generated works. This creates uncertainty regarding whether the user, developer, platform provider, or another legal subject should be recognized as the owner of artificial intelligence outputs. For this reason, reform of copyright regulation is needed to clarify the legal status, ownership structure, and rights allocation of works generated through artificial intelligence technology.

Use of Copyrighted Works as Training Data

The use of copyrighted works as training data is one of the most debated issues in the relationship between artificial intelligence and copyright law. Atkinson (2025) introduce the concept of fair learning by arguing that the use of copyrighted materials for machine learning may be justified when the system learns from data without directly replacing or reproducing the protected expression. However, Guadamuz (2024) emphasizes that artificial intelligence training still raises legal questions regarding whether the use of copyrighted works as input constitutes infringement and whether the generated outputs may also infringe copyright. In Indonesia, this issue is relevant to Law Number 28 of 2014 on Copyright because the law protects various forms of works, including written works, computer programs, artistic works, photographs, and databases. Nevertheless, the law does not yet specifically regulate text and data mining, artificial intelligence training, or licensing mechanisms for copyrighted datasets, which strengthens the urgency of regulatory reform.

Patent Law, Technological Inventions, and Artificial Intelligence-Based Innovation

Artificial intelligence is not only relevant to copyright law but also to patent law because it may support the creation of technological inventions, computer-implemented systems, and industrial innovations. Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024 provides the main legal framework for inventions in the field of technology, including inventions that may involve computer-based systems. However, legal uncertainty arises when artificial intelligence contributes substantially to the inventive process, especially in determining who should be recognized as the inventor. Picht et al. (2022) emphasize that artificial intelligence challenges existing intellectual property doctrines because traditional legal protection was not designed for autonomous machine outputs. Therefore, patent law reform should consider whether the concepts of invention and inventor remain adequate to respond to technological solutions generated or assisted by artificial intelligence.

Electronic Systems, Digital Governance, and Legal Responsibility

Artificial intelligence operates within electronic systems and produces electronic information or electronic documents, making digital governance an important part of intellectual property law reform. Law Number 11 of 2008 on Electronic Information and Transactions, as amended by Law Number 19 of 2016 and Law Number 1 of 2024, is relevant because it regulates electronic information, electronic documents, electronic systems, and electronic agents. Government Regulation Number 71 of 2019 on the Implementation of Electronic Systems and Transactions also strengthens the analysis because it regulates the responsibilities of electronic system providers, system reliability, security, risk management, and digital governance. Zhang & Huang (2025) note that the opacity of generative artificial intelligence platforms creates difficulties in identifying data sources, decision-making processes, and responsible parties. Therefore, legal responsibility in artificial intelligence systems should not be limited to users but must also consider the roles of developers, data providers, and electronic system providers.

Personal Data Protection and Ethical Governance of Artificial Intelligence

Artificial intelligence development often depends on large-scale data processing, including personal data, behavioral data, and user-generated content. Law Number 27 of 2022 on Personal Data Protection is therefore relevant as a supporting legal instrument because it regulates personal data, data subject rights, automated processing, lawful basis for processing, and the obligations of data controllers and processors. In addition, Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics provides an ethical foundation for responsible artificial intelligence implementation in Indonesia. This circular letter emphasizes transparency, accountability, safety, personal data protection, and compliance with intellectual property principles. Thus, the governance of artificial intelligence must integrate intellectual property protection, data protection, ethical responsibility, and accountability.

METHOD

Type, Approach, and Research Design

This study uses a normative juridical research method with a qualitative legal analysis design. This method is appropriate because the research focuses on legal norms, legal principles, legal doctrines, and regulatory gaps concerning intellectual property law in responding to the development of artificial intelligence technology. The study applies statutory, conceptual, and comparative approaches to examine Indonesian positive law and international legal discourse related to artificial intelligence and intellectual property. The statutory approach is used to analyze regulations concerning copyright, patents, electronic information, electronic system governance, personal data protection, and artificial intelligence ethics. This approach is consistent with previous legal studies that examined artificial intelligence-generated works, authorship, originality, and copyright liability through normative and doctrinal legal analysis (Ampovska, 2025).

Legal Materials and Research Corpus

Because this study is normative legal research, it does not involve respondents, informants, or field participants. The research corpus consists of primary legal materials, secondary legal materials, and international policy documents selected through purposive selection based on their relevance to artificial intelligence-generated works, copyrighted training data, technological inventions, electronic system responsibility, and personal data processing. The primary legal materials include Law Number 28 of 2014 on Copyright, Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024, Law Number 11 of 2008 on Electronic Information and Transactions as amended by Law Number 19 of 2016 and Law Number 1 of 2024, Government Regulation Number 71 of 2019 on the Implementation of Electronic Systems and Transactions, Law Number 27 of 2022 on Personal Data Protection, and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics. These legal materials were selected because they are directly connected to the legal issues of authorship, ownership, technological invention, electronic information, system accountability, data protection, and ethical governance in artificial intelligence development (Hakimi et al., 2025).

Relevance of Legal Regulations

The selected regulations are relevant because they provide the main and supporting legal framework for analyzing the urgency of intellectual property law reform in response to artificial intelligence. Law Number 28 of 2014 on Copyright and Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024 serve as the main intellectual property framework for examining authorship, ownership, originality, moral rights, economic rights, inventorship, and technological inventions related to artificial intelligence. Law Number 11 of 2008 on Electronic Information and Transactions as amended by Law Number 19 of 2016 and Law Number 1 of 2024, together with Government Regulation Number 71 of 2019, is relevant because artificial intelligence operates within electronic systems and produces electronic information or electronic documents. Law Number 27 of 2022 on Personal Data Protection and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics function as supporting instruments for examining data protection, ethical governance, transparency, accountability, and responsible use of artificial intelligence technology. The relevance of these regulations also reflects the need to harmonize intellectual property protection, digital governance, and ethical accountability in artificial intelligence systems (Kiani & Shafiee, 2022).

Data Collection Techniques and Research Instruments

Data were collected through library research and documentation study by examining laws and regulations, legal doctrines, peer-reviewed journal articles, institutional reports, international policy documents, and relevant scholarly literature from 2020 to 2024. The research instrument used in this study was a legal material review matrix designed to classify legal sources according to their relevance to copyright law, patent law, electronic information regulation, electronic system governance, personal data protection, artificial intelligence ethics, and regulatory reform. The secondary legal materials include studies by Rezaev & Tregubova (2023), as well as institutional documents from the World Intellectual Property Organization and Stanford Institute for Human-Centered Artificial Intelligence. Since this study does not use questionnaires, interviews, or field observation, statistical validity and reliability testing are not applied. The credibility of the analysis is maintained through source triangulation, legal source hierarchy, and consistency between legal norms, doctrines, and scholarly arguments (Leheza et al., 2026).

Research Procedure

The research was conducted through several systematic stages. First, the study identified the main legal issues arising from artificial intelligence technology, including artificial intelligence-generated works, ownership of artificial intelligence outputs, the use of copyrighted works as training data, patentability of artificial intelligence-based inventions, and legal liability of users, developers, platform providers, and electronic system providers. Second, the study mapped relevant Indonesian regulations and selected legal instruments related to copyright, patents, electronic information, electronic systems, personal data protection, and artificial intelligence ethics. Third, the study examined relevant national and international literature to identify theoretical debates, regulatory gaps, and comparative perspectives concerning the relationship between artificial intelligence and intellectual property law. Fourth, the selected materials were organized into thematic categories, including authorship, originality, ownership, moral rights, economic rights, inventorship, data processing, system accountability, ethical governance, and regulatory reform. Finally, the findings were synthesized to formulate the urgency and direction of intellectual property law reform in Indonesia (Nasution & Judijanto, 2024).

Data Analysis Technique and Supporting Tools

The data were analyzed using qualitative legal analysis through statutory interpretation, systematic interpretation, conceptual analysis, and comparative legal analysis. Statutory interpretation was used to examine Law Number 28 of 2014 on Copyright, Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024, Law Number 11 of 2008 on Electronic Information and Transactions as amended by Law Number 19 of 2016 and Law Number 1 of 2024, Government Regulation Number 71 of 2019, Law Number 27 of 2022 on Personal Data Protection, and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics. Systematic interpretation was applied to connect intellectual property law with electronic information regulation, electronic system governance, personal data protection, and artificial intelligence ethics as an integrated regulatory framework. Conceptual analysis was used to clarify traditional legal concepts such as creator, inventor, originality, ownership, moral rights, economic rights, and liability in relation to machine-generated outputs. (Vebritha, 2024).

Regulatory Focus and Analytical Boundaries

The regulatory focus of this study is limited to legal instruments directly related to intellectual property protection, artificial intelligence governance, electronic systems, electronic information, and data protection. Law Number 28 of 2014 on Copyright is used to analyze creator status, works, moral rights, economic rights, protected works, limitations, and the use of works in digital environments. Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024 is used to examine artificial intelligence as a technological invention, including computer-implemented inventions and inventorship. Law Number 11 of 2008 on Electronic Information and Transactions as amended by Law Number 19 of 2016 and Law Number 1 of 2024, together with Government Regulation Number 71 of 2019, is used to analyze artificial intelligence as part of electronic systems that require accountability, reliability, security, and proper digital governance. Law Number 27 of 2022 on Personal Data Protection and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics are used to evaluate automated processing, data protection, transparency, accountability, safety, and compliance with intellectual property principles (Lal et al., 2024).

RESULTS AND DISCUSSION

A. Artificial Intelligence-Generated Works and the Limitation of Copyright Regulation

The results of the normative analysis show that Law Number 28 of 2014 on Copyright provides protection for works, creators, moral rights, and economic rights, but it does not specifically regulate works generated by artificial intelligence. The law remains centered on the concept of a human creator, while artificial intelligence systems are now capable of producing texts, images, music, computer programs, designs, and other creative outputs that resemble human-created works. This finding indicates that the existing copyright framework provides partial protection only when there is clear human creative contribution. However, when the output is generated autonomously or semi-autonomously by artificial intelligence, legal uncertainty arises regarding whether the user, developer, platform provider, or no party at all should be recognized as the legal creator or right holder.

This result is consistent with Praja et al. (2025), who found that Indonesian copyright law still relies on human authorship and has not adequately accommodated artificial intelligence-generated works. Saunders (2023), also explains that authorship in copyright law is closely connected to causality, intention, and human creative contribution. The implication of this finding is that Indonesian copyright regulation needs reform to clarify the legal

status of artificial intelligence-generated works, the threshold of human contribution, and the allocation of moral and economic rights. Without such clarification, creative industry actors and technology users may face uncertainty when using artificial intelligence outputs for commercial purposes. Therefore, the reform of Law Number 28 of 2014 on Copyright should include more explicit provisions on artificial intelligence-assisted works, artificial intelligence-generated works, ownership structure, and responsibility for infringing outputs.

B. Copyrighted Works as Training Data and the Absence of Specific Text and Data Mining Rules

The study also finds that the use of copyrighted works as training data is one of the most urgent regulatory gaps in Indonesian intellectual property law. Law Number 28 of 2014 on Copyright protects various works, including written works, computer programs, artistic works, photographs, and databases. However, the law does not yet provide specific rules on whether copyrighted materials may be used for artificial intelligence training, text and data mining, machine learning, or large-scale dataset development. This creates uncertainty because artificial intelligence training often involves collecting, copying, processing, and analyzing large amounts of copyrighted materials. As a result, the legality of using copyrighted works as input data remains unclear under the current Indonesian copyright framework.

This finding partly aligns with Sag (2024), who argue that machine learning may be understood as “fair learning” when it does not directly substitute or reproduce protected expression. However, it also supports Wu (2025), who emphasizes that artificial intelligence training raises two major legal issues: whether the use of copyrighted input constitutes infringement and whether artificial intelligence outputs may infringe copyright. The difference between these views shows that the legality of training data remains contested in global legal scholarship. In the Indonesian context, the absence of specific text and data mining rules means that legal reform is necessary to define permissible use, licensing mechanisms, transparency obligations, and compensation schemes for creators whose works are used in artificial intelligence training. Such reform would help balance the protection of copyright holders with the need to support technological innovation.

C. Patent Law and Artificial Intelligence-Based Technological Inventions

The analysis of Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024 shows that Indonesian patent law provides a legal framework for inventions in the field of technology. This regulation is relevant because artificial intelligence may be used to develop technological solutions, optimize industrial processes, support computer-implemented systems, and generate technical inventions. However, the regulation still relies on the conventional concept of an inventor as a legal subject connected to human intellectual contribution. The result shows that Indonesian patent law is able to protect artificial intelligence-related inventions when human inventors can be clearly identified, but it does not specifically address situations where artificial intelligence contributes substantially to the inventive process. This creates uncertainty in determining inventorship and ownership of patent rights in artificial intelligence-assisted innovation.

This finding supports Picht et al. (2022), who state that artificial intelligence challenges existing intellectual property doctrines because traditional legal protection was not designed for autonomous machine outputs. It also aligns with Abbott & Rothman (2023), who argue that generative artificial intelligence disrupts established intellectual property norms by transforming the boundaries of innovation and knowledge production. The consequence is that patent law reform should not only focus on administrative improvement but also on conceptual clarification. Indonesian patent regulation needs to explain how artificial intelligence-assisted inventions should be assessed, how human inventive contribution should be measured, and whether artificial intelligence can be treated merely as a tool or as a substantial contributor to invention. This would strengthen legal certainty for inventors, technology developers, and industries using artificial intelligence-based innovation.

D. Electronic Systems, Platform Responsibility, and Digital Governance

The findings indicate that Law Number 11 of 2008 on Electronic Information and Transactions, as amended by Law Number 19 of 2016 and Law Number 1 of 2024, is relevant because artificial intelligence operates within electronic systems and produces electronic information or electronic documents. Government Regulation Number 71 of 2019 on the Implementation of Electronic Systems and Transactions further strengthens the legal basis for analyzing the responsibility of electronic system providers, system reliability, security, risk management, and digital governance. These regulations provide a supporting framework for artificial intelligence governance, especially when artificial intelligence services are offered through digital platforms. However, the regulations do not specifically determine responsibility for intellectual property infringement caused by artificial intelligence outputs.

This creates uncertainty regarding whether liability should be placed on users, developers, platform providers, data providers, or electronic system providers.

This result is important because the production of artificial intelligence outputs often involves several actors and technical processes that are not fully transparent. Goktas (2024) note that the opacity of generative artificial intelligence platforms creates difficulties in identifying data sources, decision-making processes, and responsible parties. In line with this, Government Regulation Number 71 of 2019 can support artificial intelligence governance through principles of reliability, security, and risk management, but additional rules are still needed to address intellectual property-specific issues. Electronic system regulation should therefore be integrated with intellectual property law reform to create clearer accountability rules. Such rules should include platform transparency, complaint mechanisms, takedown procedures, audit obligations, and allocation of responsibility when artificial intelligence-generated outputs infringe protected works.

E. Personal Data Protection and Ethical Governance in Artificial Intelligence Development

The study finds that Law Number 27 of 2022 on Personal Data Protection is relevant as a supporting regulation because artificial intelligence development often involves large-scale data processing, including personal data, behavioral data, user-generated content, and automated profiling. Although personal data protection law is not an intellectual property regulation, it is closely connected to artificial intelligence governance because datasets used for training or system improvement may contain personal information. The regulation provides a legal basis for examining lawful data processing, data subject rights, automated decision-making, data security, and accountability of data controllers and processors. However, the law does not specifically regulate the intersection between personal data protection and intellectual property protection in artificial intelligence training and output generation. This creates a gap when personal data and copyrighted materials are processed together in artificial intelligence systems.

Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics also provides an ethical foundation for artificial intelligence implementation in Indonesia. The circular letter emphasizes transparency, accountability, safety, personal data protection, and compliance with intellectual property principles. This finding shows that Indonesia has begun to recognize the need for artificial intelligence governance, but the existing ethical guidance remains soft law and does not yet provide binding legal consequences. This is relevant to global findings showing that the rapid expansion of artificial intelligence requires stronger legal and ethical governance to prevent misuse and reduce legal uncertainty (Benefo et al., 2022). Therefore, ethical governance should be strengthened through binding regulation that integrates personal data protection, intellectual property compliance, risk management, transparency, and accountability.

F. Synthesis of Regulatory Findings

Table 1.1 Synthesis of Regulatory Findings on Intellectual Property Law Reform in Response to Artificial Intelligence Technology

Legal Issue	Relevant Regulation	Main Finding	Reform Urgency
Artificial intelligence-generated works	Law Number 28 of 2014 on Copyright	Copyright law protects human-created works but does not specifically regulate artificial intelligence-generated works.	Clarification of authorship, ownership, moral rights, and economic rights is needed.
Use of copyrighted works as training data	Law Number 28 of 2014 on Copyright	The law does not specifically regulate text and data mining, artificial intelligence training, or copyrighted datasets.	Licensing, transparency, and compensation mechanisms should be developed.
Artificial intelligence-based inventions	Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024	Patent law protects technological inventions but does not clearly regulate artificial intelligence-assisted inventorship.	Rules on human contribution and artificial intelligence-assisted inventions are needed.
Electronic system accountability	Law Number 11 of 2008 as amended by Law Number 19 of 2016 and Law Number 1 of 2022	Artificial intelligence operates through electronic systems, but	Platform responsibility, audit duties, and complaint

Legal Issue	Relevant Regulation	Main Finding	Reform Urgency
	2024; Government Regulation Number 71 of 2019	liability for infringing outputs remains unclear.	mechanisms should be clarified.
Data protection and ethical governance	Law Number 27 of 2022 on Personal Data Protection; Circular Letter Number 9 of 2023 concerning Artificial Intelligence Ethics	Data protection and ethics rules support artificial intelligence governance but do not fully regulate intellectual property consequences.	Binding governance rules are needed to integrate data protection, ethics, and intellectual property compliance.

The overall findings indicate that Indonesia already has several relevant legal instruments for responding to the development of artificial intelligence technology. Law Number 28 of 2014 on Copyright and Law Number 13 of 2016 on Patents, as amended by Law Number 65 of 2024, serve as the core intellectual property framework. Meanwhile, Law Number 11 of 2008 on Electronic Information and Transactions, Government Regulation Number 71 of 2019, Law Number 27 of 2022 on Personal Data Protection, and Circular Letter Number 9 of 2023 concerning Artificial Intelligence Ethics provide supporting frameworks for digital governance, data protection, and ethical responsibility. However, these regulations remain sectoral and fragmented. None of them specifically and comprehensively regulates artificial intelligence-generated works, ownership of artificial intelligence outputs, the use of copyrighted data for training, or legal responsibility among users, developers, and platforms. Therefore, this study confirms the urgency of reforming Indonesian intellectual property law to strengthen legal certainty, protect creators, and support responsible artificial intelligence innovation.

G. Direction of Intellectual Property Law Reform

Based on the findings, the reform of Indonesian intellectual property law should be directed toward harmonizing copyright law, patent law, electronic system regulation, personal data protection, and artificial intelligence ethics. First, copyright law should distinguish between human-created works, artificial intelligence-assisted works, and artificial intelligence-generated works. Second, the law should establish rules on the use of copyrighted works as training data, including permissible use, licensing, collective management, transparency, and compensation. Third, patent law should clarify the position of artificial intelligence-assisted inventions and the threshold of human inventive contribution. Fourth, electronic system regulation should define the responsibility of platform providers and developers when artificial intelligence systems produce infringing outputs. Fifth, artificial intelligence ethics should be strengthened into more binding legal norms to ensure transparency, accountability, safety, personal data protection, and intellectual property compliance.

This reform direction contributes theoretically to the development of intellectual property law by expanding the discussion of authorship, originality, ownership, inventorship, and liability in the context of machine-generated outputs. It also contributes practically by offering a regulatory roadmap for policymakers, legal scholars, technology developers, creative industry actors, and electronic system providers. This finding is consistent with Th (2025), who emphasize that artificial intelligence creates doctrinal pressure on existing copyright law, and with Nugroho & Dwisvimiari (2026), who argue that Indonesian copyright law needs a more adaptive framework for artificial intelligence-generated works. The results show that legal certainty cannot be achieved by relying only on existing sectoral regulations. Future studies should further compare Indonesian law with regulatory developments in other jurisdictions and examine how artificial intelligence regulation can be implemented in specific sectors such as creative industries, education, health, and digital commerce.

CONCLUSION

This study concludes that Indonesian intellectual property law has not fully responded to the legal challenges created by the development of artificial intelligence technology. The findings show that Law Number 28 of 2014 on Copyright and Law Number 13 of 2016 on Patents as amended by Law Number 65 of 2024 provide important protection for human-created works and technological inventions, but they do not specifically regulate artificial intelligence-generated works, ownership of artificial intelligence outputs, the use of copyrighted works as training data, or artificial intelligence-assisted inventorship. In addition, Law Number 11 of 2008 on Electronic Information and Transactions as amended by Law Number 19 of 2016 and Law Number 1 of 2024, Government Regulation Number 71 of 2019, Law Number 27 of 2022 on Personal Data Protection, and Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning Artificial Intelligence Ethics provide supporting

frameworks for electronic systems, data protection, accountability, and ethical governance. However, these regulations remain sectoral and fragmented, so regulatory reform is necessary to strengthen legal certainty, protect creators and right holders, clarify the responsibilities of users, developers, and platform providers, and support responsible artificial intelligence innovation in Indonesia.

The limitation of this study lies in its normative juridical approach, which focuses on the analysis of laws, legal doctrines, academic literature, and policy documents without involving empirical data from creators, technology developers, platform providers, policymakers, or artificial intelligence users. Therefore, future research should conduct empirical or comparative legal studies to examine how artificial intelligence-related intellectual property issues occur in practice and how other jurisdictions regulate artificial intelligence-generated works, training data, and platform liability. Further studies are also recommended to focus on specific sectors, such as creative industries, education, health technology, financial technology, and digital commerce, in order to provide more practical and sector-based recommendations. Through such further research, the development of artificial intelligence regulation in Indonesia can become more comprehensive, adaptive, and responsive to both technological innovation and the protection of intellectual property rights.

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