

Who Owns Ai-Generated Content? Examining Copyright Challenges in The Era of Generative Artificial Intelligence

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Abstract: *The emergence of generative artificial intelligence technologies such as large language models and image diffusion models has fundamentally changed the landscape of creative work, as machines are now capable of producing text, images, music, and audiovisuals with a level of sophistication that resembles human work, thus giving rise to legal uncertainty regarding who is entitled to be called the creator and copyright holder of such content. This article aims to critically examine the conceptual and normative challenges faced by the copyright regime, particularly Indonesian copyright law, in responding to the phenomenon of works produced by generative artificial intelligence, by placing the principles of legal flexibility and adaptability as the main analytical framework amidst global technological disruption. This research uses a normative juridical method with a statutory approach, a conceptual approach, and a comparative legal approach, by examining relevant primary, secondary, and tertiary legal materials, including developments in decisions and policies in the United States, China, and Indonesia. The study results show that the requirements of authenticity and human authorization that are the foundation of Law Number 28 of 2014 concerning Copyright have not explicitly anticipated works born from autonomous generative processes, thus creating a normative vacuum regarding the legal status of artificial intelligence outputs, responsibility for copyright infringement in the data training process, and the division of ownership between users, platform developers, and training data providers.*

Keywords: *Adaptive Law; Copyright; Generative Artificial Intelligence; Content Ownership; Technological Disruption.*

INTRODUCTION

The legal world is constantly faced with the challenge of adapting to social, economic, and technological changes that are occurring far faster than the legislative process itself. This phenomenon is becoming increasingly apparent as the generative artificial intelligence revolution penetrates nearly every aspect of human life, from text writing and image creation to music composition to audiovisual production, previously believed to be the exclusive domain of human creativity. Large language models and image diffusion models, which have developed rapidly since late 2022, have demonstrated the ability to produce output that is qualitatively indistinguishable from human-made works, raising fundamental questions about the legal status of such works, particularly in the context of copyright.¹ This question goes beyond the administrative technicalities of registering works, but rather touches on the philosophical foundations of

¹ Tan, J., Cinar, A. E., & Benyekhle, K. (2026). Can You Trust What You See? Human and AI Detection of Synthetic Legal Evidence. *arXiv preprint arXiv:2606.07613*.

copyright law, which for centuries has been built on the premise that only humans can be creators and rights holders of works.

In fact, copyright law is not the first to face challenges posed by new technologies that change the way humans create. When photography first emerged in the nineteenth century, a similar debate arose over whether images produced through the medium of a camera could be considered copyrighted works worthy of protection, given that their creation involved mechanical devices and not the mere handwriting of a human hand, as with conventional painting. This debate was ultimately resolved by recognizing that the photographer could still be considered the creator as long as he or she made creative choices in the photographing process, such as composition, lighting, and angle.² A similar pattern of adjustment occurred with the rapid development of computer software in the late twentieth century, to which copyright law responded by expanding the category of protected works to include computer programs as a legitimate type of creation. This historical precedent confirms that copyright law inherently has the capacity to adapt to new technologies. Therefore, the challenges posed by generative artificial intelligence today should be viewed not as a threat to be avoided, but as an opportunity for the law to once again demonstrate its adaptive capacity, as has been demonstrated repeatedly throughout the history of technological development.

The disruption brought about by generative artificial intelligence is forcing policymakers, academics, and legal practitioners to rethink fundamental concepts such as originality, creativity, and authorization that constitute the requirements for copyright protection. In many jurisdictions, the responses differ, reflecting a tension between conservative approaches that strictly require human authorization and more progressive approaches that seek to accommodate human intellectual contributions in the interaction process with machines. The United States Copyright Office, for example, has consistently asserted that human authorization is a prerequisite for copyright registration, making works produced entirely by machines without sufficient human creative control ineligible.³ This stance was reinforced in a series of decisions refusing registration, including against graphic novel illustrations generated by text-to-image software,⁴ and reinforced by a court decision that rejected an application for registration of a visual work that was explicitly claimed to be generated autonomously by an algorithm without human involvement as the creator.⁵

In contrast to this approach, the Beijing Internet Court in China has taken a more accommodating approach by recognizing that a user's intellectual investment in selecting, composing, and refining text commands or prompts to a generative artificial intelligence model can qualify as originality and therefore deserves copyright protection on behalf of the user as the creator.⁶ The differences in approach between these two major jurisdictions highlight the lack of global consensus on how copyright law should treat works produced through human collaboration with generative artificial intelligence, creating cross-border legal uncertainty that could potentially harm creative industry players, including those in Indonesia, whose products are increasingly circulating in the global digital marketplace.

² Hassan, M. M. (2025). The Impact of AI on Transforming Concepts in Contemporary Photography. *AM Journal of Art and Media Studies*, (36). <https://doi.org/10.25038/am.v0i28.613>

³United States Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence, Federal Register Vol. 88, No. 51, 16 Maret 2023.

⁴United States Copyright Office, Cancellation Decision re: Zarya of the Dawn (Registration VAu001480196), 21 Februari 2023.

⁵Thaler v. Perlmutter, No. 22-1564 (D.D.C. 18 Agustus 2023).

⁶Li v. Liu, (2023) Jing 0491 Min Chu No. 11279, Beijing Internet Court, 27 November 2023.

In Indonesia, the current legal framework for copyright is based on Law Number 28 of 2014 concerning Copyright, which expressly defines a creator as a person or persons, individually or collectively, who produce a creation that is unique and personal.⁷ This definition implicitly requires a human legal subject as the creator, so that when the status of generative artificial intelligence output is questioned, the law does not provide an explicit answer as to whether the user who composed the text commands, the model developer, the training data provider, or even no one else has the rights to the creation. This normative vacuum is increasingly crucial given the rapid adoption of generative artificial intelligence by creative industry players, academics, journalists, and digital entrepreneurs in Indonesia, who use various artificial intelligence tools to produce marketing content, illustrations, writing, and even learning materials on a massive scale.

The Indonesian government has demonstrated its awareness of the urgency of artificial intelligence governance through the issuance of Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 concerning the Ethics of Artificial Intelligence, which contains ethical values such as inclusivity, security, humanity, as well as credibility and accountability in the development and utilization of artificial intelligence.⁸ However, the circular is expressly stated to be a soft guideline that is not legally binding and is aimed primarily at business actors and electronic system providers, not at the academic community or individual creators, so it is not yet able to answer the need for legal certainty regarding copyright ownership of content produced by generative artificial intelligence.⁹ This gap is exacerbated by the absence of any revisions or implementing regulations to the Copyright Law that specifically regulate the status of artificial intelligence outputs, even though Law Number 27 of 2022 concerning Personal Data Protection and the Electronic Information and Transactions Law, which was amended by Law Number 19 of 2016, also do not specifically address the issue of ownership of generative works, but rather focus more on personal data protection and the governance of electronic transactions in general.¹⁰

The disruption of generative artificial intelligence to copyright law is actually part of a broader phenomenon, namely the transformation of the digital economy that has completely changed the patterns of production, distribution, and consumption of creative works in the past two decades. While in the past, the production of creative works required specialized technical skills possessed by only a handful of individuals, the presence of generative artificial intelligence has drastically reduced these technical barriers, allowing almost anyone with internet access to produce visual, written, or audio content in a matter of seconds. This democratization of creative production tools has on the one hand brought significant benefits to the wider community, including micro, small, and medium-sized businesses that previously had difficulty accessing professional design or writing services. On the other hand, it has also had serious consequences for the structure of the conventional creative work market, including the potential decline in the economic

⁷Pasal 1 angka 2 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

⁸Surat Edaran Menteri Komunikasi dan Informatika Republik Indonesia Nomor 9 Tahun 2023 tentang Etika Kecerdasan Artifisial, ditetapkan 19 Desember 2023.

⁹Lihat pernyataan Wakil Menteri Komunikasi dan Informatika bahwa Surat Edaran Nomor 9 Tahun 2023 bersifat pedoman lunak yang tidak mengikat dan tidak secara spesifik disiapkan untuk masyarakat akademik, sebagaimana dilaporkan Suara.com, 27 Desember 2023.

¹⁰Undang-Undang Nomor 27 Tahun 2022 tentang Pelindungan Data Pribadi; Undang-Undang Nomor 11 Tahun 2008 tentang Informasi dan Transaksi Elektronik sebagaimana diubah dengan Undang-Undang Nomor 19 Tahun 2016.

value of human works due to the flood of content produced massively and at low cost by generative artificial intelligence. The complexity of these economic and social impacts demands that copyright law policy is not formulated narrowly as a technical matter of registration, but rather as part of a broader and more equitable digital economic policy.

Based on the above description, this research is motivated by the urgent need to comprehensively examine how the concept of adaptive law can be applied in responding to the disruption caused by generative artificial intelligence to the copyright regime, especially in Indonesia. Legal flexibility in this context is understood not as a haphazard relaxation of legal principles, but rather as the ability of the legal system to make measured conceptual and normative adjustments in order to remain relevant to answer new problems without losing coherence with the established principles of copyright law.¹¹ Departing from this background, this research formulates two main problems: first, how the concept of copyright ownership and the challenges of determining the status of creators are understood in dealing with works produced by generative artificial intelligence reviewed from the perspective of national law and comparative international law; and second, how the reconstruction of the Indonesian copyright legal framework should ideally be formulated to be adaptive and responsive to the development of generative artificial intelligence without sacrificing legal certainty and protection for human creators.

The urgency of this study becomes even more apparent when placed within the context of the global regulatory landscape, which is moving toward more comprehensive regulation of artificial intelligence. The European Union, for example, enacted the Artificial Intelligence Act on July 12, 2024, which, among other things, requires providers of general-purpose artificial intelligence models to develop copyright compliance policies and publish detailed summaries of the content used as model training data, as part of an effort to balance technological innovation with the protection of creators' rights.¹² Such transparency provisions, while not directly addressing the question of ownership of artificial intelligence outputs, provide an important precedent for how disclosure obligations can serve as legal instruments to mitigate the uncertainty created by generative processes that are technically black box to their creators.

The economic scale of artificial intelligence cannot be ignored in assessing the urgency of improving copyright law in Indonesia, considering that the global market value of artificial intelligence in 2023 is recorded at around one hundred and forty-two point three billion US dollars, while the economic value of artificial intelligence in the ASEAN region is projected to contribute to the region's gross domestic product of up to one trillion US dollars by 2030. Such a large economic scale confirms that the issue of copyright ownership of generative artificial intelligence content is not merely a theoretical academic discourse, but rather an issue that has a direct impact on the bargaining position of Indonesia's creative economy in the global digital industry value chain, so that delays in legal reform have the potential to place national creative actors and digital business actors at a disadvantage compared to competitors from jurisdictions that already have clearer legal certainty.

¹¹ Jubaidi, D., & Khoirunnisa, K. (2025). Legal Analysis of the Advancement of AI and Blockchain Amid Lagging Digital Copyright Regulation in Indonesia. *Journal of Judicial Review*, 27(2), 393-420. <https://doi.org/10.37253/jjr.v27i2.11069>

¹² Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 (Artificial Intelligence Act), OJ L, 12 Juli 2024, Pasal 53(1)(c)-(d); lihat juga Guadamuz, The EU's Artificial Intelligence Act and Copyright, *The Journal of World Intellectual Property*, 2025.

This study aims to deeply analyze the concepts of ownership and authorization in copyright law when dealing with generative works of artificial intelligence, as well as formulate a proposed reconstruction of legal policy that can be adopted by Indonesia in facing this disruption. The significance of this study lies in its contribution to the development of academic discourse on intellectual property law in Indonesia, which is still relatively limited in specifically examining the interaction between generative artificial intelligence and copyright, while also providing concrete input for policy makers in formulating the direction of national copyright law reform to accommodate technological developments without sacrificing the protection of human creators' human rights and the interests of the national creative economy.

METHODOLOGY

This research uses a normative legal research method or normative juridical, namely research that examines law as a written norm by examining legal materials in the library as primary data, without conducting empirical field research.¹³ The approaches used in this research include a statutory approach to examine Law Number 28 of 2014 concerning Copyright and its implementing regulations, a conceptual approach to explore the concepts of originality, creativity, and human authorization in copyright doctrine, and a comparative legal approach to compare judicial arrangements and practices in the United States and China as two jurisdictions that have produced important precedents on the issue of ownership of generative artificial intelligence works. The legal materials used in this study consist of primary legal materials in the form of laws and regulations applicable in Indonesia, including Law Number 28 of 2014 concerning Copyright, Law Number 11 of 2008 concerning Electronic Information and Transactions as amended by Law Number 19 of 2016, Law Number 27 of 2022 concerning Personal Data Protection, and Circular Letter of the Minister of Communication and Information Technology Number 9 of 2023 concerning Artificial Intelligence Ethics, supplemented by legal materials from foreign jurisdictions in the form of registration guidelines and policy reports of the United States Copyright Office and decisions of the Beijing Internet Court. Secondary legal materials include textbooks, national and international indexed scientific journals, research results from research institutions, and analyses by intellectual property law practitioners regarding the development of generative artificial intelligence, while tertiary legal materials include legal dictionaries and encyclopedias used to clarify technical terms.

The legal material collection technique is carried out through library research by searching for official documents, scientific publications, and online legal databases relevant to the research topic. The collected legal materials are then analyzed qualitatively using a descriptive-analytical method, namely describing the legal norms and facts found, then analyzing them systematically to find relationships, contradictions, and normative gaps (*rechtsvacuum*), so that a coherent legal argument can be formulated regarding the concept of copyright ownership of generative artificial intelligence works and an offer of policy reconstruction that is relevant to the Indonesian legal context. This research has limitations that need to be stated honestly, namely that the study is focused on the normative and conceptual level and therefore does not include empirical testing of the perceptions of creative industry players or copyright registration practices in the field. The scope of the material is also limited by selecting the United States and China as the focus of the legal comparison, considering that both jurisdictions have produced relatively mature legal precedents and are widely referenced in global academic discourse regarding the ownership of generative artificial intelligence works, while developments in other jurisdictions such as the European Union are only touched on limitedly as additional comparisons without being studied in depth. This limitation is open to follow-up

¹³ Wulandari, P. (2026). Normative Legal Research Methodology from the Experts' Perspective: A Comparative Analysis of Concepts and Approaches. *Archipel: Journal of Indonesian Interdisciplinary Studies*, 1(6), 12-25. <https://doi.org/10.65739/archipel.v1i6.34>

through further research that is empirical in nature or that expands the scope of the legal comparison in the future.

RESULTS AND DISCUSSION

A. The Concept of Copyright Ownership and the Challenges of Determining the Status of Creators of Generative Artificial Intelligence Works

Copyright law has historically been built on the philosophical premise that protection is granted as a form of recognition of creative expression born from human personality, aesthetic considerations, and intellectual choices. This principle is explicitly reflected in Law Number 28 of 2014 concerning Copyright, which defines copyright as the exclusive right of the creator that arises automatically based on the declarative principle after a work is realized in a tangible form, with the creator defined as an individual or several people who individually or jointly produce a work that is unique and personal.¹⁴ The phrase "distinctive and personal" indicates that Indonesian law places the requirement of human personality as a constitutive element of a creation, so that doctrinally it is difficult to imagine a non-human entity, including an artificial intelligence system, being able to qualify as a creator in the formal legal sense.¹⁵

The provisions regarding the types of protected works as regulated in Article 40 of the Copyright Law are also formulated by assuming that the work is produced by humans, whether in the form of written works, lectures, songs, dramas, works of fine art, photography, or audiovisual works, without providing a special category for works produced through autonomous computing processes.¹⁶ The absence of this special category causes the output of generative artificial intelligence to be in a legal grey area, because on the one hand, the output can factually fulfill the element of tangible form as required by the declarative principle of copyright protection, but on the other hand, it does not necessarily fulfill the element of originality which is unique and personal if the creation process is dominated by algorithms without significant human creative contribution.

This issue becomes even more complex when one explores the spectrum of human involvement in the creation process using generative artificial intelligence, which in practice is not binary but rather hierarchical. At one end of the spectrum is the use of generative artificial intelligence merely as a tool, for example, to brainstorm initial ideas, develop an outline, or refine grammar, where the final expression remains dominated by human creative choices.¹⁷ At the other end of the spectrum is the use of generative artificial intelligence entirely, where the user simply enters a single, simple text command and receives the final output without any substantive modification, thus limiting human contribution to the initial trigger of the generative process. In between these two ends of the spectrum lies a vast gray area, including the use of carefully crafted and iterative sequences of text commands, choosing among alternative outputs, and significant post-generation editing, all of which require case-by-case analysis to determine whether human contributions meet the threshold of originality required by copyright law.

¹⁴Pasal 1 angka 1 dan angka 2 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

¹⁵ Geiger, C., Schönherr, F., & Jütte, B. J. (2023). Limitations to copyright in the digital age, safeguards for users' rights, creativity and authors remuneration interests. In *Research handbook on EU internet law* (pp. 149-178). Edward Elgar Publishing. <https://doi.org/10.4337/9781803920887.00014>

¹⁶Pasal 40 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

¹⁷ Bozkurt, A., Xiao, J., Lambert, S., Pazurek, A., Crompton, H., Koseoglu, S., ... & Jandrić, P. (2023). Speculative futures on ChatGPT and generative artificial intelligence (AI): A collective reflection from the educational landscape. *Asian Journal of Distance Education*, 18(1). https://digitalcommons.odu.edu/teachinglearning_fac_pubs/199

The United States Copyright Office addressed the complexity of this spectrum through a registration policy published in March 2023, which affirmed that human authorization remains an essential requirement for copyright protection in the United States, and that if a work contains more than a de minimis amount of artificially generated material, the applicant must disclose this and explain the human creative contribution.¹⁸ This policy was subsequently applied consistently in a number of registration refusal decisions, including one against the graphic novel "Zarya of the Dawn" in February 2023, where the Copyright Office stated that the illustrations generated by the Midjourney software were not the product of human authorization and therefore the registration certificate should be limited to the text and overall layout of the work composed by humans, without including machine-generated images.¹⁹ A similar position was also affirmed in the case of "Théâtre D'Opéra Spatial" in September 2023, when the Copyright Review Board refused the registration of a visual work generated by artificial intelligence and subsequently modified by the applicant, on the grounds that the applicant did not adequately identify and exclude the machine-generated portion as required by the registration guidelines.²⁰

The culmination of this consistent stance is reflected in Thaler's case against the Copyright Office, in which Stephen Thaler filed a petition for registration of a visual work he claimed was "autonomously" generated by an artificial intelligence program without human creative involvement, arguing that the requirement for human authorization was not expressly mandated by copyright law. A United States District Court ruled in August 2023 that human authorization is essential to a valid copyright claim, reasoning that only humans require copyright incentives to encourage the creation of expressive works, a ruling subsequently affirmed by the District of Columbia Court of Appeals in March 2025.²¹ This series of precedents confirms that the United States legal system firmly rejects the concept of machine authorship, but leaves open the possibility of copyright recognition for human contributions that are separable from machine-generated elements, as reaffirmed in the Copyright Office's second policy report published in January 2025 on copyrightability, which concluded that human contributions to AI outputs can qualify for authorization as long as they are analyzed on a case-by-case basis and the humans retain sufficient creative control over the expressive elements of the work.²²

A diametrically different approach was demonstrated by the Beijing Internet Court in China in the *Li v. Liu* case decided on November 27, 2023, which for the first time in China recognized that images generated using open-source image diffusion software can obtain copyright protection on behalf of the user as the creator.²³ The court asserted that the artificial intelligence system itself cannot be the author because Chinese copyright law strictly limits the definition of an author to a natural person or legal entity, and the developer of the artificial intelligence system cannot be classified as the author of a particular output because their intellectual contribution lies in the creation of the tool, not in the resulting image. Instead, the

¹⁸United States Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence, Federal Register Vol. 88, No. 51, 16 Maret 2023.

¹⁹United States Copyright Office, Cancellation Decision re: *Zarya of the Dawn* (Registration VAu001480196), 21 Februari 2023.

²⁰United States Copyright Office Review Board, Decision Refusing Registration of *Théâtre D'Opéra Spatial*, 5 September 2023.

²¹*Thaler v. Perlmutter*, No. 22-1564 (D.D.C. 18 Agustus 2023), dikuatkan *Thaler v. Perlmutter*, No. 23-5233 (D.C. Cir. 18 Maret 2025).

²²United States Copyright Office, Copyright and Artificial Intelligence, Part 2: Copyrightability, 29 Januari 2025.

²³*Li v. Liu*, (2023) Jing 0491 Min Chu No. 11279, Beijing Internet Court, 27 November 2023.

court found that the plaintiff, as the user, had made a significant intellectual investment through the careful selection and arrangement of over one hundred and fifty text commands, the determination of the order in which they were arranged, the setting of various technical parameters, and the process of repeated adjustments and refinements until the final image conformed to the desired aesthetic conception, so that the entire process reflects personal expression and originality worthy of protection as a work of art.²⁴

This comparison between the US and Chinese approaches demonstrates that the crucial point of difference lies not in the rejection of the concept of machine authorship, as both jurisdictions agree that artificial intelligence systems themselves cannot be subject to copyright law, but rather in the threshold of human contribution deemed sufficient to qualify for originality.²⁵ The Beijing Internet Court is willing to recognize that the repetitive creation and refinement of text commands, without traditional artistic skills such as manual drawing or painting, can still represent a personalization of expression worthy of protection, while the US Copyright Office tends to view the mere creation of text commands, without direct control over traditional elements of authorization such as word choice, visual arrangement, or musical expression produced directly by human hands, as insufficient to qualify for meaningful authorization.²⁶ It is this kind of doctrinal tension that Indonesian copyright law must pay close attention to, considering that national creative actors interacting with the global digital market will face different legal regimes depending on the jurisdiction where the work is registered or disputed.

The synthesis of all these theoretical and comparative explanations shows that the issue of copyright ownership for generative artificial intelligence works cannot be answered solely through a single legal doctrine, but rather requires an analytical framework that simultaneously considers the degree of human creative contribution, the interests of economic incentives for technological development, the interests of original creators whose works are used as training data, and the broader public interest in access to knowledge and creativity. These four interests are often in tension with each other, so that every policy choice taken, whether it tends to be strict like the United States or more accommodating like China, is essentially the result of a balancing between these interests that reflects the priorities and values adopted by each legal system. For Indonesia, this balancing should ideally be carried out consciously and explicitly through a participatory legislative or policy-making process, rather than being allowed to develop ad hoc through inconsistent administrative practices of copyright registration, so that the final result truly reflects the national interest that has been carefully considered.

In the context of Indonesian law, the absence of explicit norms regarding the ownership of generative artificial intelligence works can actually be traced analogously through the provisions regarding creations produced in employment relationships or based on orders, as regulated in Article 37 of the Copyright Law, which in principle regulates the division of copyright ownership between creators who work in an employment relationship and the party who employs them, unless otherwise agreed.²⁷ This analogy demonstrates that Indonesian law already has a conceptual precedent for separating "the party that produces

²⁴Hogan Lovells, Beijing Internet Court Grants Copyright Protection for AI Artworks, but Copyrightability Debate of AI-Generated Output Continues, 6 Desember 2023.

²⁵Kumar, S., & Yadav, A. (2024, October). Recent trends in major world jurisdictions regarding copyright law and works generated by artificial intelligence: A comparative analysis of the European union, the United States, and Japan. In *AIP Conference Proceedings* (Vol. 3220, No. 1, p. 040009). AIP Publishing LLC. <https://doi.org/10.1063/5.0235002>

²⁶Bandingkan Wolters Kluwer, Beijing Internet Court Grants Copyright to AI-Generated Image for the First Time, Kluwer Copyright Blog, 2 Februari 2024, dengan United States Copyright Office, Copyright and Artificial Intelligence, Part 2: Copyrightability, 29 Januari 2025.

²⁷Pasal 37 Undang-Undang Nomor 28 Tahun 2014 tentang Hak Cipta.

the physical or technical output" from "the party entitled to economic ownership," so a similar construction could potentially be adapted to regulate the relationship between users of generative artificial intelligence, platform developers, and training data providers. However, this analogy cannot be applied directly without modification, because the employment relationship assumes the existence of two human legal subjects or legal entities bound by an agreement, whereas in the context of generative artificial intelligence, one of the "parties" that produces the output is an algorithmic system that is not a legal subject, so a new conceptual framework is needed that specifically regulates this relationship without granting legal subject status to the machine itself.

Another equally important challenge is the issue of legal liability for copyright infringement that may occur in the process of training generative artificial intelligence models, which generally use massive amounts of training data sourced from the internet, including copyrighted works without the explicit permission of their creators.²⁸ This phenomenon has triggered a wave of lawsuits in various jurisdictions against developers of generative artificial intelligence models, and although this study does not specifically examine all of these disputes, the existence of these lawsuits confirms that the issue of copyright in generative artificial intelligence is not only limited to the question of ownership of the output, but also includes questions regarding the legitimacy of the training data input process itself, both of which must be considered in an integrated manner in formulating a comprehensive copyright law policy for Indonesia going forward.

As an additional comparative note, it is also worth noting that there is actually another regulatory model that already anticipated the issue of computer-generated works, as reflected in British copyright law, which since the late 1980s has regulated a special category of "computer-generated works," which grants authorship to the person who makes the arrangements necessary for the creation of the work, without requiring a human author in the traditional sense.²⁹ This regulatory model offers a third alternative beyond the dichotomy of the strict US approach and the intellectual investment-based Chinese approach, namely by explicitly creating a new legal category for computer-generated works and allocating ownership to the party primarily responsible for the technical arrangements for their creation. Although this model has long been criticized for blurring the requirement of originality that centers on human personality, its existence remains relevant as a comparison for Indonesia in considering whether a separate legal category is needed that explicitly regulates generative artificial intelligence works, rather than forcing the application of the conventional definition of author that does not fully correspond to the character of contemporary generative processes.

The issue of copyright ownership of generative artificial intelligence works cannot be separated from the fundamental theoretical debate regarding the philosophical justification for the protection of intellectual property rights itself. The theory of natural rights, rooted in Locke's thinking, views copyright as a logical consequence of the creator's outpouring of energy and thought into an object, so that protection is granted as recognition of the personal effort that has been poured out, while the utilitarian theory, which emphasizes the incentive function, views copyright as a policy instrument to encourage the birth of more creative works for the benefit of society as a whole.³⁰ When both theories are applied to the context of generative artificial intelligence, the theory of natural rights tends to have difficulty accommodating ownership claims over

²⁸ Lucchi, N. (2024). ChatGPT: a case study on copyright challenges for generative artificial intelligence systems. *European Journal of Risk Regulation*, 15(3), 602-624. doi:10.1017/err.2023.59

²⁹ Takeuchi, S. S. (2025). Japan's legal framework for copyright protection of AI-generated works: A comparative law analysis exploring the possibility of Japan's adoption of the UK legislative approach. *The Journal of World Intellectual Property*, 28(2), 323-343. <https://doi.org/10.1111/jwip.12333>

³⁰ Dhingra, R. M., & Dewani, N. D. (2024). Intellectual Property Rights: Theoretical Foundations to Practical Considerations. *Intellectual Property Rights and Competition Law in India*, 1-15.

outputs produced with minimal human contribution, because there is no significant outpouring of personal energy, while the utilitarian theory is relatively more flexible because it can consider whether providing legal incentives for the use of generative artificial intelligence will encourage more innovation and creative productivity, so that a hybrid approach between the two theories seems more relevant to be used as a justification framework for Indonesian copyright law in formulating proportional policies.

Comparative law can also be enriched by examining Japan's approach, known for its relative progressiveness in accommodating the needs of artificial intelligence technology development, particularly through the provisions for exemptions from the use of copyrighted works for data analysis and machine learning purposes, which have been in place for several years before the explosion in popularity of generative artificial intelligence, with the consideration that such use generally does not directly enjoy the expressive value of the original work but only exploits the statistical patterns within it. This permissive approach is driven by Japan's industrial policy, which deliberately aims to position itself as a center for artificial intelligence technology development in the Asian region. However, this approach has also drawn criticism from creators who feel their economic interests are less protected than the more cautious approaches adopted by the European Union and the United States. Comparing Japan's permissive approach with more protective approaches in other jurisdictions confirms that formulating policies regarding the use of generative artificial intelligence training data always involves policy choices that reflect each country's priorities between encouraging the growth of the technology industry and protecting the economic interests of creators. Therefore, Indonesia needs to carefully determine the balance that best suits the conditions of its creative economy and the maturity level of its own domestic artificial intelligence industry, rather than simply copying an existing model without contextual adjustments.

Another aspect that needs to be considered is the status of the creator's moral rights as regulated in the Copyright Law, which grants the creator the perpetual right to have his name included, to maintain the integrity of the work, and to retain the title and subtitle of the work even if the economic rights have been transferred to another party. The application of moral rights to works of generative artificial intelligence raises its own conceptual questions, because moral rights are doctrinally established to protect the personal and reputational bond between the creator and his work, whereas in works of generative artificial intelligence such personal bonds are often blurred, especially when the output is generated through a series of short text commands without deep aesthetic involvement. Nevertheless, as long as the user can be considered the creator based on an adequate threshold test of creative contribution, moral rights should remain attached to him as to other creators of conventional works, including the right to be recognized as the creator and the right to object to modifications that are detrimental to his honor or reputation.

Legal developments in the European Union also enrich the comparative perspective in this study, albeit with a different emphasis than in the United States and China. Under the Artificial Intelligence Act, which will come into effect gradually starting in August 2025, providers of general-purpose artificial intelligence models are required to implement a policy of compliance with EU copyright law and to compile a detailed summary of the content used as model training data.³¹ This provision indicates that the EU has chosen not to directly address the question of ownership of generative artificial intelligence outputs, but rather to focus on strengthening transparency obligations for model developers, so that copyright holders whose work is used as training data have the means to trace and enforce their rights, an approach that differs philosophically from both the US approach focused on output authorization requirements and China's approach focused on recognizing the originality of user contributions.

³¹Regulation (EU) 2024/1689 (Artificial Intelligence Act), Pasal 53(1)(c)-(d), berlaku efektif 2 Agustus 2025.

Efforts to build a global consensus on this issue have also been undertaken through the World Intellectual Property Organization (WIP) forum, which in recent years has actively held a series of policy dialogues on artificial intelligence and intellectual property to bring together the views of developed and developing countries, including debates on the need for a more harmonized multilateral framework rather than the unilateral approaches currently developing separately in each jurisdiction. Although the forum has not yet produced a formally binding international legal instrument, its existence is important for Indonesia as a member country to observe, given that the results of these policy dialogues have the potential to influence the direction of future harmonization of global intellectual property law, including the possibility of the birth of a new international instrument specifically regulating the protection of generative artificial intelligence works. Indonesia's active participation in such forums is crucial so that the interests of the national creative economy are accommodated in the formulation of international norms, rather than simply being a passive recipient of standards formulated by developed countries with more established generative artificial intelligence industries.

An equally complex technical challenge is the difficulty of proving the extent to which a work was actually produced or modified by generative artificial intelligence, given the often black-box nature of machine learning algorithms, even for their developers. This makes it difficult to accurately trace human contributions objectively. Currently available AI content detection technologies are also not yet fully reliable and are still prone to misidentification, either in the form of failing to detect content that is actually machine-generated or mistakenly attributing human work to algorithms.³² This situation emphasizes that legal resolution of the issue of ownership of generative AI works cannot rely solely on post-production technical verification, but must be built through honest and proactive disclosure mechanisms from the users themselves from the beginning of the creation process, supported by an adequate sanctions system for parties who intentionally conceal or falsify information regarding the use of AI in their work.

B. Reconstruction of the Indonesian Copyright Legal Framework in Facing Generative Artificial Intelligence-Based Works

Facing the complexity of the issues outlined in the previous subchapter, the concept of adaptive law becomes relevant as a framework for formulating the direction of the reconstruction of Indonesian copyright law. Adaptive law in this context is understood as the legal system's ability to make measured and responsive normative adjustments to technological developments, without having to completely overhaul the established structure and basic philosophy of copyright law. This approach aligns with the character of copyright law itself, which has historically continually adapted to the emergence of new technologies, from photography and sound recording to computer software, each of which has, in its own time, given rise to similar debates regarding the registration of works produced through machine intermediaries.

The first step that needs to be taken within an adaptive legal framework is to progressively interpret existing norms in the Copyright Law, particularly regarding the definitions of creator and creation, by adopting the human creative contribution threshold test as practiced by both the United States Copyright Office and the Beijing Internet Court, albeit with adjustments to the Indonesian social and creative economy context. This threshold test ideally takes into account a number of indicators, including the level of detail and uniqueness of the user-composed text commands, the intensity of the iterative process of refining the output, the involvement of creative choices among the various alternative outputs produced, and the significance of post-generation editing performed by the user. The higher the level of human creative involvement in these elements, the stronger the justification for recognizing the user as a copyright-entitled

³² Boutadjine, A., Harrag, F., & Shaalan, K. (2025). Human vs. machine: A comparative study on the detection of AI-generated content. *ACM Transactions on Asian and Low-Resource Language Information Processing*, 24(2), 1-26. <https://doi.org/10.1145/3708889>

creator. Conversely, output generated solely from a single generic text command without substantive modification should be viewed as public domain material that does not qualify for protection.

The second step, which is no less important, is the preparation of official technical guidelines by the Directorate General of Intellectual Property of the Ministry of Law, which specifically regulates the procedures for registering creations involving elements of generative artificial intelligence, following the practice implemented by the United States Copyright Office in the form of a disclosure obligation for applicants to explain the extent to which artificial intelligence is used in the creation process and the accompanying human creative contributions.³³ This kind of disclosure obligation is important to maintain the integrity of the declarative copyright registration system in Indonesia, while also providing legal certainty for third parties who wish to use or license the work, because they can transparently know to what extent a work is truly the result of human originality and to what extent it is an algorithmic output that has the potential to be in the public domain.

This principle of transparency actually has an initial foundation in national policy through Circular Letter of the Minister of Communication and Informatics Number 9 of 2023, which emphasizes the value of credibility and accountability as one of the ethical pillars of artificial intelligence in Indonesia, including the obligation for electronic system organizers to ensure high transparency and auditability accompanied by complaint and dispute resolution mechanisms.³⁴ Although the circular is formally addressed to business actors and electronic system providers and does not directly regulate the legal relationship between individuals regarding copyright, the principles of transparency and accountability contained therein can and should be adopted as an ethical basis for the formulation of technical policies for copyright registration of generative artificial intelligence works, so as to create cross-sector policy consistency between the governance of artificial intelligence in general and the governance of intellectual property rights in particular.

The third step is the need for an in-depth study of sui generis protection options for generative artificial intelligence outputs that do not meet the requirements for full originality but still have significant economic value, following the conceptual precedents of database or industrial design protection already known in the Indonesian intellectual property law system. Such a sui generis scheme could provide limited protection, for example in the form of related rights (neighboring rights) that are narrower in duration and scope than full copyright, thereby providing a minimal economic incentive for investment in the use of generative artificial intelligence without necessarily granting full status as a "creation" in the traditional sense that requires personal originality. Such a tiered approach allows Indonesian law to avoid a rigid dichotomy between "fully protected" and "not protected at all," and is in line with the adaptive nature of law that prioritizes proportionality of protection according to the level of creative contribution that actually occurs.

The fourth step that requires serious attention is the regulation of legal responsibility for the use of generative artificial intelligence training data containing third-party copyrighted works without permission, considering that this issue is closely related to the economic rights of original creators whose works are used as training model materials without compensation or consent.³⁵ Indonesia can consider the

³³United States Copyright Office, Copyright Registration Guidance: Works Containing Material Generated by Artificial Intelligence, Federal Register Vol. 88, No. 51, 16 Maret 2023.

³⁴Surat Edaran Menteri Komunikasi dan Informatika Republik Indonesia Nomor 9 Tahun 2023 tentang Etika Kecerdasan Artifisial, ditetapkan 19 Desember 2023.

³⁵Pasetti, M., Santos, J. W., Corrêa, N. K., de Oliveira, N., & Barbosa, C. P. (2025). Technical, legal, and ethical challenges of generative artificial intelligence: an analysis of the governance of training

development of a compulsory collective licensing scheme managed by a collective copyright management institution, as is already known in the management of music and song royalties in Indonesia, to be expanded in scope to accommodate compensation for creators whose works are used in commercial generative artificial intelligence training models, so that a balance is created between encouraging technological innovation and protecting the economic rights of human creators who have so far been the source of training data without adequate compensation.

The fifth step is the importance of harmonizing Indonesian copyright law policies with developments in artificial intelligence governance at the regional and global levels, including paying attention to the ethical principles of artificial intelligence formulated by international organizations, so that Indonesia is not left behind in managing the economic and cultural implications of the generative artificial intelligence revolution while being able to maintain the competitiveness of national creative industry players in the global digital market. This harmonization is important considering that content produced using generative artificial intelligence by Indonesian creative actors is increasingly being circulated and marketed across national borders, so that misalignment between copyright protection standards in Indonesia and standards in other jurisdictions has the potential to cause economic losses and legal uncertainty for national creative business actors when dealing with cross-border disputes.³⁶

In addition to these five steps, it is also important to consider the broader social and economic impacts of generative artificial intelligence disruption on Indonesia's creative industry ecosystem, including concerns about the potential displacement of conventional creative jobs by generative artificial intelligence outputs that can be mass-produced at much lower costs. Adaptive copyright law policies ideally should not only focus on the technical aspects of ownership, but also consider the dimension of distributive justice, for example through fiscal incentives or social protection schemes for human creators whose professions are most impacted by creative automation, so that the reconstruction of copyright law can go hand in hand with more comprehensive employment and creative economy policies.

In formulating the mandatory collective licensing scheme as mentioned in the previous discussion, Indonesia actually already has an institutional foundation that can be further developed, namely the National Collective Management Institution, which has been responsible for managing and distributing song and music copyright royalties from commercial users to creators and related rights holders. This institutional experience can serve as a basic model for developing a collective compensation mechanism for the use of copyrighted works as training data for generative artificial intelligence, although it will certainly require significant technical adjustments considering the much more massive and cross-border scale of training data compared to conventional music royalty management. This expansion of the institutional mandate is also in line with the spirit of the creative economy, which is one of the priorities for national development, considering that Indonesia's creative economy sector, which includes the subsectors of fine arts, publishing, film, music, and digital applications, is highly dependent on the certainty of copyright protection as a primary incentive for the continued production of creative works amidst the rapid flow of automation based on generative artificial intelligence.

The Indonesian context shows that this issue is no longer a hypothetical discourse, but has become a practical reality faced by various sectors, from the media industry which is increasingly utilizing generative artificial intelligence to produce news illustrations, publishers who are facing a surge in manuscripts indicating the use of generative artificial intelligence in the writing process, to the academic world which

data and copyrights. *Discover Artificial Intelligence*, 5(1), 193. <https://doi.org/10.1007/s44163-025-00379-6>

³⁶ Asri, D. P. B., & Humaira, I. (2026). Digital Cultural Heritage Protection in the Era of Artificial Intelligence from the Perspective of Indonesian Intellectual Property Law. *International Journal of Science and Environment (IJSE)*, 6(1), 610-616.

is grappling with the challenge of detecting and assessing the authenticity of scientific works amidst easy access to automatic writing tools. This phenomenon demands that copyright law policies are not formulated separately from other sectoral policies, for example academic ethics policies and broadcasting policies, but rather be formulated in an integrated manner so that the principles of transparency and disclosure of the use of generative artificial intelligence can be applied consistently across sectors, thereby creating a comprehensive ecosystem of trust in the authenticity of works circulating in the Indonesian public space.

The scientific and academic publishing sector in Indonesia is one of the areas most directly impacted by the disruption of generative artificial intelligence, given the increasing number of journal articles, books, and other academic papers being written with the help of generative artificial intelligence tools at various levels, from mere grammatical refinement to significant argumentative substance development. Scientific journal managers and publishers in Indonesia are faced with a dual challenge: on the one hand, they need to ensure that published works still meet the requirements of originality and authenticity of creation as required by copyright law and scientific publication ethics, but on the other hand, they also need to accommodate the reality that the use of generative artificial intelligence as a writing aid has become a common practice and is difficult to completely avoid. Adaptive copyright law policies ideally also provide clear guidance to the scientific publishing sector regarding the limits of generative artificial intelligence contributions that are still tolerable without revoking human authorship, for example by requiring disclosure of the use of generative artificial intelligence tools in the methodology section or acknowledgements of the manuscript, in line with practices that are starting to be adopted by various international journal publishers, so that academic integrity is maintained without having to close off space for the responsible use of technology.³⁷

To achieve synchronization of cross-sectoral policies, this study recommends the formation of a cross-ministerial and institutional task force involving the Ministry of Law, the Ministry of Communication and Digital, and the Ministry of Education, to develop integrated guidelines on the use of generative artificial intelligence that cover aspects of copyright, ethics, and data governance simultaneously. Such a task force is important to avoid overlapping policies that could potentially arise if each ministry formulates guidelines separately without coordination, while also ensuring that the ethical principles of artificial intelligence formulated in Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 can be coherently aligned with the technical policies for copyright registration to be developed by the Directorate General of Intellectual Property, so that business actors and individual creators obtain consistent legal certainty from all authorized government agencies.

In addition to institutional reform, strengthening legal literacy and AI literacy for creators, creative industry players, and the general public is also a crucial element that cannot be overlooked in this adaptive legal strategy. Many individual creators in Indonesia who utilize generative AI in their creative processes do not yet fully understand the legal implications of such use, including the risk that their work will not receive copyright protection if the human creative contribution is deemed inadequate, as well as the risk of third-party copyright infringement if the generative AI output turns out to resemble a protected work. Educational programs involving collective management institutions, creative industry associations, and universities need to be systematically promoted so that creative actors can use generative AI responsibly, understand the limits of creative contributions required to obtain legal protection, and understand the disclosure mechanisms that must be met when registering their work.

³⁷ Liu, S., & Zou, T. (2026). Navigating the Paradigm Shift: Risks, Regulations, and Governance of Academic Publishing in the Age of AIGC. *Journal of Scholarly Publishing*, (aop), e240109. <https://doi.org/10.3138/jsp-2024-0109>

The significance of the national creative economy reinforces the urgency of improving this legal framework, given that the creative economy sector has long been positioned as one of the mainstays of the Indonesian economy outside the natural resources sector, with the subsectors of application and game development, publishing, film, animation, video, music, and fine arts and design providing a continuously increasing contribution to the national gross domestic product and the absorption of creative labor in various regions.³⁸ The presence of generative artificial intelligence has the potential to significantly change the production cost structure in these subsectors, so that national creative entrepreneurs who are able to adopt this technology responsibly and with adequate legal certainty will have a competitive advantage over those who lag behind, both in the context of domestic competition and competition with creative entrepreneurs from other countries in the global digital market. Therefore, a copyright law policy that is adaptive to generative artificial intelligence should be seen not merely as an instrument of restriction, but also as an instrument of empowerment that allows Indonesian creative economy actors to utilize new technology optimally without losing legal protection for the authentic creative contributions they have poured out.

As a complement to these policy measures, Indonesia can also consider adopting mandatory labeling or watermarking for content generated by generative artificial intelligence, following regulatory trends that are starting to be implemented at the international level, including transparency provisions for artificial intelligence systems with specific transparency risks within the framework of the European Union's Artificial Intelligence Act that requires disclosure of the artificial nature or results of manipulation of content to the public.³⁹ This kind of labeling obligation, if adopted in the Indonesian context, could strengthen the principles of credibility and accountability that have been formulated in the Circular Letter of the Minister of Communication and Information Technology Number 9 of 2023, while also providing more concrete technical means for enforcing disclosure obligations in the copyright registration process, so that the public and registration authorities have a more reliable tool to trace the origin of a work amidst the limitations of artificial intelligence content detection technology that is currently still being developed.

Ultimately, the reconstruction of Indonesia's copyright legal framework in dealing with generative artificial intelligence works must be viewed as an ongoing process that requires regular monitoring and evaluation, given that generative artificial intelligence technology itself is developing at such a rapid pace that legal norms formulated today have the potential to require further adjustments in a relatively short time. This dynamic character is at the heart of the idea of adaptive law, which is not simply formulating static and final rules, but rather building institutional mechanisms that allow the law to continuously adapt responsively, for example through the technical regulatory authority delegated to the Directorate General of Intellectual Property to issue guidelines that can be updated periodically without having to wait for a lengthy full legislative process, so that Indonesian copyright law can remain relevant in responding to the ever-evolving dynamics of generative artificial intelligence.

CONCLUSIONS

Based on all the descriptions and analyses presented, it can be concluded that the emergence of generative artificial intelligence has caused fundamental disruption to the philosophical foundation of copyright law which has so far relied on the premise of human authorization as an absolute condition for protection, thus demanding the law to demonstrate adaptive capacity in responding to these changes without

³⁸ Kusumaningrum, D. N., Prasetya, D. M., & Wibowo, N. F. S. (2024). Unveiling creative economy resilience in indonesia amidst the global pandemic: A media analysis. *Innovation in the Social Sciences*, 2(1), 86-118.

³⁹ Regulation (EU) 2024/1689 (Artificial Intelligence Act), ketentuan transparansi konten hasil kecerdasan buatan dan deepfake.

losing coherence with its basic principles. A comparative legal study between the conservative approach of the United States which consistently maintains strict human authorization requirements and the more accommodating approach of the Beijing Internet Court in China which is willing to recognize the intellectual investment of users in the preparation of text commands as a form of originality, shows that there is no global consensus yet on the threshold of human creative contributions sufficient to meet the requirements for copyright protection for works of generative artificial intelligence.

Indonesian copyright law as stipulated in Law Number 28 of 2014 concerning Copyright has not explicitly anticipated the phenomenon of generative artificial intelligence works, resulting in a normative vacuum regarding the legal status of these outputs, the division of ownership between users, platform developers, and training data providers, and responsibility for potential copyright infringement in the model training process. The artificial intelligence ethics policy issued by the government through Circular Letter of the Minister of Communication and Informatics Number 9 of 2023 does indeed demonstrate initial awareness of the urgency of artificial intelligence governance, but its non-binding nature and limited scope to business actors and electronic system providers have not been able to adequately address the need for legal certainty in the realm of copyright.

Adaptive reconstruction of Indonesian copyright law needs to be achieved through a combination of five strategic steps, namely progressive interpretation of existing norms by adopting a threshold test for human creative contributions, the development of technical guidelines for registration accompanied by mandatory transparency in the use of artificial intelligence, the study of sui generis protection options for outputs that do not meet full originality, the regulation of responsibility and compensation for the use of training data through a collective licensing scheme, and the harmonization of policies with developments in artificial intelligence governance at the global level. These five steps must be understood as an ongoing process that requires responsive institutional mechanisms, considering that the very rapid pace of development of generative artificial intelligence technology requires the law to continue to adapt in a measured manner to maintain a balance between encouraging technological innovation, protecting the economic and moral rights of human creators, and maintaining the competitiveness of the national creative economy amidst the unavoidable global technological disruption.

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