

Legal Protection of Copyright as a Digital Asset in Technology-Based Commercial Transactions in Indonesia

Ariy hirudin

ari.khaerudin@gmail.com

Faculty of Law, Master of Law, Batik Islamic University of Surakarta

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Abstract

The development of digital technology has driven the transformation of the global economy, including in Indonesia, through the commercialization of digital assets such as creative works, Non-Fungible Tokens (NFTs), and e-commerce platforms. However, the national legal system is still unable to accommodate these dynamics comprehensively. This study aims to analyze the effectiveness of legal protection of Copyright as a digital asset in technology-based transactions, using normative legal methods and legislative, conceptual, and comparative legal approaches. The results of the study show that Law Number 28 of 2014 concerning Copyright and related regulations still has a gap in norms in dealing with new forms of digital intellectual property, weak law enforcement, and limited technical understanding by law enforcement officers. In addition, the less-than-optimal regulation in the financial, taxation, and personal data protection sectors increases the legal risks for digital economy actors, especially MSMEs and content creators. Therefore, responsive legal reforms are needed to strengthen the digital justice system, integrate technologies such as blockchain and AI, and increase legal literacy and coordination between institutions. This reform is important to create a fair, safe, and sustainable digital ecosystem that supports the growth of the national creative economy.

1. Introduction

The development of digital technology has driven a major transformation in the world of trade and economic transactions, especially through e-commerce and digital platforms. In this context, Copyright as a form of intellectual property has not only cultural value but also significant monetary value.

Unfortunately, the legal framework governing copyright protection in Indonesia, as stated in Law Number 28 of 2014 concerning Copyright, still faces a number of challenges in adapting to digital dynamics, both in terms of legal substance and enforcement mechanisms (Njatrijani et al., 2020). Copyright infringement in the digital realm is evidence that the existing legal system is not yet responsive enough. Cases of piracy, counterfeiting, and illegal distribution of digital works have increased rapidly along with the growth of the e-commerce sector, causing major losses for creators and business actors. The lack of product authenticity validation features and certification systems on digital platforms makes it difficult for copyright owners to obtain effective protection (Lumbanraja & Khasanah, 2022). This situation indicates the need for technology-based policy reform to anticipate digital challenges in concrete terms.

The integration of technologies such as blockchain and non-fungible tokens (NFTs) opens up new opportunities for copyright protection and commercialization. However, Indonesian regulations have not fully accommodated the legal aspects of this innovation. For example, NFTs can represent unique digital artwork, but there are no provisions that explicitly protect the rights of creators in the context of NFT transactions.

(Rosadi et al., 2024). Therefore, there needs to be a regulatory update that not only regulates ownership but also the mechanisms for protection, transactions, and digital dispute resolution. The idea of establishing an Internet Court, like in China, also emerged as an alternative solution to accelerate the legal process for digital copyright infringement. With the support of artificial intelligence (AI) technology and blockchain-based evidence verification, this digital justice system can increase efficiency and legal certainty (Putranti et al., 2025). This concept is in line with the strengthening of the e-court system in Indonesia but still requires strengthening of regulations, infrastructure, and human resource capacity in law enforcement agencies.

Another problem is the use of Copyright as an object of fiduciary guarantee for access to business financing. Many digital MSMEs have potential intellectual property but have difficulty using it as collateral because there are no clear asset assessment guidelines, and coordination between institutions such as Bank Indonesia and DJKI is not yet optimal (Njatrijani et al., 2020). Comprehensive legal protection of Copyright in this form is essential to support the ecosystem of the national digital economy. Given the complexity of the problem, holistic legal reform is needed through the adoption of best international practices, such as the European Union, and increasing digital literacy in society. This will strengthen the legal position of copyright holders in technology-based transactions, as well as create a safe, fair, and sustainable digital business climate (Maharani et al., 2025). Without adaptive and integrative legal reform, Indonesia risks being left behind in providing effective protection for Copyright as a digital asset in the era of a technology-based economy (Jaelani et al., 2023).

In the context of efforts to strengthen digital copyright protection, research by Maddusila et al. (2024) shows that copyright infringement on social media and

digital platforms is increasing due to weak law enforcement and regulatory unpreparedness in responding to the dynamics of digital content. This study emphasizes that the legal process for digital violations still relies on conventional procedures that are slow and inefficient. This emphasizes the urgent need for a digital justice system that is able to adapt to the characteristics of violations in cyberspace, including the establishment of special institutions such as the Internet Court, which has been successfully implemented in China. In addition, Rosadi et al. (2024), in their research on copyright regulation in the context of Non-Fungible Tokens (NFTs), stated that Indonesia does not yet have an adequate legal framework to protect digital works traded in the form of NFTs. Although NFTs provide great opportunities for creative industry players to obtain economic value from their digital works, the absence of specific regulations leaves creators vulnerable to duplication, piracy, and unauthorized ownership claims. These findings indicate that Indonesia's intellectual property law policy is still lagging behind global technological developments, so proactive and futuristic regulatory updates are needed.

In this study, the author aims to examine the effectiveness of copyright protection regulations in Indonesia in responding to the challenges posed by the development of digital assets in technology-based commercial transactions. The focus of the analysis is directed at the extent to which applicable laws and regulations, such as Law Number 28 of 2014 concerning Copyright, are able to provide adequate legal protection for forms of digital intellectual property, including those traded through e-commerce platforms, social media, and Non-Fungible Token (NFT) technology. In addition, this study also aims to identify and formulate legal efforts and policies that can be taken to strengthen copyright protection as a digital asset, both through regulatory updates, integration of technologies such as blockchain in the verification system, and through institutional reform, such as the development of a digital court system (Internet Court) that is adaptive to developments in information technology.

2. Research Method

This study uses a normative legal research method, namely research that aims to examine the applicable positive legal norms, especially related to copyright protection as a digital asset in technology-based commercial transactions. This approach emphasizes library research to analyze relevant laws and regulations, legal principles, doctrines, and court decisions. The types and sources of legal materials used in this study consist of primary legal materials, secondary legal materials, and tertiary legal materials. Primary legal materials include Law Number 28 of 2014 concerning Copyright, Law Number 11 of 2008 concerning Information and Electronic Transactions (ITE) and its amendments, and other implementing regulations related to Copyright and digital asset protection. Secondary legal materials are obtained from literature such as books, scientific articles, legal journals, and expert opinions that are relevant to the subject of the study. Tertiary legal materials are in the form of legal dictionaries,

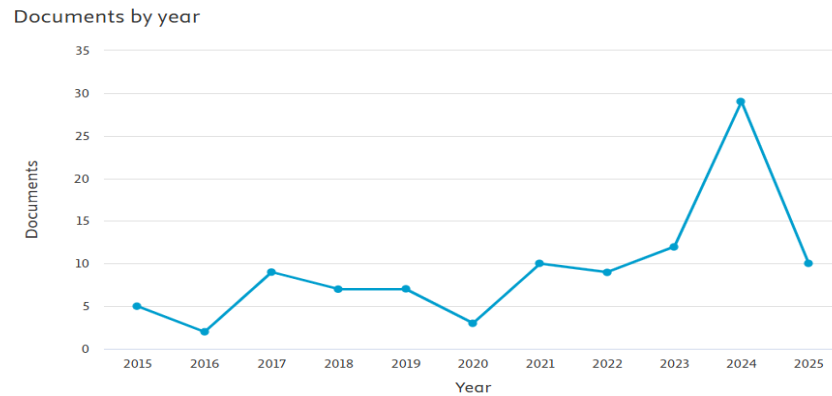
encyclopedias, and indexes that support understanding of the legal terms and concepts used.

The legal material collection technique is carried out by searching legal documents and academic literature, both from printed and electronic sources. Furthermore, the legal materials are analyzed using a statute approach, a conceptual approach, and a comparative legal approach to examine how other countries, especially the European Union and China, regulate digital copyright protection comprehensively (Putranti et al., 2025). The results of the analysis are presented in a qualitative descriptive manner by systematically outlining the strengths and weaknesses of the legal norms applicable in Indonesia, as well as providing legal arguments regarding the need for legal reform in order to strengthen copyright protection as a digital asset in the technological era.

3. Results and Discussion

Effectiveness of Copyright Protection Regulations in Indonesia

Legal protection of Copyright in Indonesia in the context of the development of digital assets faces increasingly complex and dynamic challenges. Although Law Number 28 of 2014 concerning Copyright has become the main legal basis for guaranteeing intellectual property rights, this regulation has not explicitly reached new forms of digital property such as Non-Fungible Tokens (NFTs), content on Over-The-Top (OTT) platforms, and creative works on social media that now dominate the digital space. This special norm vacuum creates a legal loophole that complicates the process of effective copyright enforcement in the digital realm (Mayana et al., 2021). In addition, limited legal instruments and weak enforcement capacity on the ground make copyright infringement on platforms such as TikTok, Telegram, and X increasingly difficult to control. The encryption and user anonymity features on these platforms also exacerbate the situation, making it nearly impossible to monitor the illegal distribution and exploitation of digital copyrighted works without progressive legal reform and adequate digital forensics technology (Maddusila et al., 2024). In the graph below, you can see how intellectual property law issues;



Based on the Documents by Year graph, it can be seen that publications or documents related to the research topic fluctuated during the period 2015 to 2025. The number of documents tended to be stable and low between 2015 and 2020, with the highest number in 2017 being 9 documents. However, a significant spike occurred in 2024, when the number of documents increased sharply to 29, reflecting the high attention and urgency to issues such as copyright protection in the digital era, including technological developments such as NFT, OTT, and e-commerce. This increase can also be associated with increasing academic awareness and government policy regarding the need for legal reform in facing the challenges of digital assets. The decline again in 2025 shows that although this issue had been a major focus, continuity of research and policy is needed so that attention to digital copyright protection is not temporary but sustainable and strategic.

The effectiveness of copyright law protection is determined not only by the quality of regulation but also by public awareness and the competence of law enforcement. In Indonesia, copyright infringement is often considered a minor violation or even not considered a violation at all. The culture of piracy and unauthorized use of works has taken root, driven by the low legal literacy of the community regarding Copyright (Irhamdessetya & Manongga, 2022). On the other hand, law enforcement officers often do not have sufficient technical understanding to handle digital copyright cases comprehensively. Some reports even show corrupt practices that hinder the legal enforcement process (Ritawati et al., 2023). As a result, the law enforcement process tends to be slow and does not have a deterrent effect. This shows that the legal protection approach must be accompanied by legal education for the wider community as well as technical and ethical training for law enforcement officers so that they can respond to digital phenomena progressively and professionally (Nugroho & Utama, 2020).

The implementation of legal protection also faces obstacles at the enforcement level. A study (Triyanto, 2017) revealed that law enforcement officers in Indonesia still have a limited understanding of the substance of copyright law, coupled with corrupt practices that weaken the enforcement

process. In addition, public awareness of copyright infringement as a form of violation of the Law is still low, thus hampering the effectiveness of existing legal protection. On the other hand, copyright protection in the business context is also not optimal. Research by (Njatrijani et al., 2020) highlights the obstacles to making Copyright an object of fiduciary guarantee, especially due to the absence of digital asset valuation standards and the limited period of intellectual property protection recognized in the financing system. This shows that Indonesia has not fully integrated digital Copyright as part of an economic asset that can be managed legally and commercially optimally.

Another challenge comes from the lack of regulation on digital platforms. As stated by (Maddusila et al., 2024), The spread of illegal content on social media shows that existing regulations have not been able to keep up with the speed and complexity of digital technology dynamics. The absence of cross-platform supervision, weak coordination between institutions, and limited digital infrastructure have led to disparities in copyright enforcement between media, which ultimately reduces the effectiveness of the Law in protecting digital assets. The MSME digitalization policy, which should be an opportunity to encourage digital copyright protection, also faces structural challenges. (Kusumaningtyas et al., 2022) explained that community culture, weak regulatory structures, and limited digital literacy hamper digital transformation in the MSME sector. In fact, copyrights of MSME digital products have the potential to become protected economic assets if accompanied by supporting legal instruments and technology.

Another aspect that contributes to the worsening effectiveness of copyright protection in Indonesia is the weak protection of traditional cultural expressions (EBT). Indonesia is a country rich in intangible cultural heritage, such as traditional dances, regional music, and weaving patterns typical of certain tribes. However, this wealth has not received adequate legal guarantees, especially in the digital realm, where exposure to cultural content is increasing (Maharani et al., 2025). Although Article 38 of the Copyright Law regulates the protection of renewable energy, its implementing provisions are still not effective because they have not been fully implemented through specific government regulations (Purwandoko et al., 2021). The state's unpreparedness to protect this cultural wealth actually opens up space for outsiders to exploit cultural works without providing proper recognition or compensation to Indigenous communities. In the context of globalization and digitalization, this situation is very detrimental to Indonesia's position in maintaining national cultural sovereignty (Suratno & Faujura, 2024).

According to Prof. Dr. Ahmad M. Ramli, an Indonesian intellectual property law expert, one of the weaknesses of current copyright regulations is the lack of alignment between national legal norms and global

technological dynamics. In various academic forums, he stated that copyright protection in the digital context requires a cross-sector and cross-disciplinary approach because digital violations are transnational and cannot be addressed with conventional legal instruments alone. In this context, legal updates are needed that include explicit regulations on the digitization of works, the use of OTT platforms, and the protection of digital metadata as part of proof of ownership rights (Ruslina, 2024). In line with that, Dr. Sinta Dewi Rosadi, an academic in the field of cyber Law and data protection, emphasized that the Indonesian legal system is still reactive and slow in dealing with technological innovation. She highlighted the importance of integrating technologies such as blockchain and artificial intelligence (AI) in the legal protection system, including in the detection and prosecution of digital copyright violations. Dr. Rosadi also emphasized the need for law enforcement agencies and courts to have the technical capacity to understand complex digital evidence. Without such capacity, the Law will always lag in responding to increasingly sophisticated modes of violation (Print & Hafaiz, 2024).

The government's digitalization policy for MSMEs also does not guarantee legal protection for the digital products they produce. Without strong digital literacy support and incentives for online copyright registration, MSMEs remain vulnerable to copyright infringement, especially in the form of plagiarism of designs, logos, and digital content used on social media or e-commerce platforms. This proves that regulations must be followed by affirmative and educational policies so that legal protection is not only normative but also implementative (Lumbanraja & Khasanah, 2022). Taking into account the views of experts and the current legal conditions, it can be concluded that the effectiveness of copyright protection for digital assets is highly dependent on three things: the speed of regulatory reform, the integration of technology into the legal system, and the strengthening of human resources in the law enforcement sector. Without improvements in these three aspects, Indonesia will continue to face a gap between legal norms and digital reality, which will ultimately harm copyright owners and hinder the growth of the national digital economy (Sudirman & Tan, 2023).

Amid the rapid development of new digital assets, such as Non-Fungible Tokens (NFT), Indonesia also faces a significant regulatory gap. NFT is a new form of digital asset with high economic value because it allows proof of unique ownership of digital works through blockchain. However, until now, there has been no specific regulation governing the legality, protection, and supervision of NFT trading and distribution in Indonesia. This results in legal uncertainty for creative industry players and digital investors (Mayana et al., 2021). Without clear regulations, the economic potential of NFTs, which has succeeded in increasing the value of the digital art market globally, cannot

be maximized in Indonesia (Rosadi et al., 2024). On the other hand, this legal vacuum can be exploited by irresponsible parties to exploit other people's work illegally. Therefore, the government must draft legal instruments that are adaptive and compatible with the dynamics of the global digital economy.

One important indicator of the effectiveness of copyright protection is the ability of the judicial system to resolve disputes quickly and fairly. However, in Indonesia, the judicial system is not yet fully prepared to deal with the complexity of digital cases (Nasrianti, Sanusi, Azhari, 2025). Although the Supreme Court has launched the e-court as an administrative innovation, the system is not yet equipped with supporting technologies such as artificial intelligence, blockchain, or digital forensics to handle digital evidence efficiently. In comparison, China has developed the Internet Court, which allows for fast and sophisticated resolution of digital copyright disputes (Putranti et al., 2025). This lag still makes the process of resolving copyright cases in Indonesia inefficient. Therefore, a reform of the judicial system is needed that not only focuses on digitizing procedures but also on increasing the technological capacity and expertise of judges in handling digital cases.

Given the complexity of the challenges above, comprehensive and integrative legal reform is needed to improve the effectiveness of copyright protection in Indonesia. This reform includes revising regulations to be more adaptive to the development of digital assets, increasing the capacity of legal institutions, and public literacy on the importance of respecting Copyright. In addition, close collaboration is needed between the government, digital industry players, technology platforms, and civil society to create a conducive ecosystem for the protection of intellectual works. Studi (Busroh, 2018) shows that a strong intellectual property rights protection system is positively correlated with economic growth and innovation. Without effective legal protection, creative industry players will only become objects of exploitation in the increasingly competitive and limitless digital market. Therefore, the transformation of copyright protection in Indonesia is not only a legal requirement but also a national strategy to build a sustainable, creativity-based economy.

The transformation of copyright protection in the digital era needs to be directed at the formation of responsive and technology-based legal mechanisms. Article 25 and Article 26 of Law Number 28 of 2014 concerning Copyright regulate the moral rights and economic rights of creators but do not explicitly regulate the protection of digital works distributed on online platforms and social media. Therefore, the digitalization of the copyright registration process through an integrated electronic system and the use of blockchain technology as valid proof of ownership are legal urgencies. In addition, Article 40 paragraph (1) of the ITE Law, in conjunction with Law

Number 19 of 2016, has stated that electronic information and/or electronic documents are valid legal evidence that can be used to strengthen the protection of digital CopyrightCopyright in legal disputes.

In the long term, the national legal system also needs to be directed towards integrating copyright protection with digital transformation policies and strengthening the creative economy ecosystem. Article 12 and Article 13 of the Copyright Law emphasize the importance of managing economic rights by creators, including in the form of licensing, sales, and distribution. Therefore, the government needs to encourage policies that support the digitalization of micro, small, and medium enterprises (MSMEs) and the protection of their works in the form of applications, designs, and digital content. Collaboration between the Ministry of Law and Human Rights, the Ministry of Communication and Information, and digital industry players is key to implementing legal protection that is not only normative but also applicable in the ever-evolving digital world. With a strong legal foundation and progressive implementation, Indonesia can build a digital copyright protection system that is sustainable, fair, and adaptive to the challenges of the times. The government needs to encourage harmonization between copyright regulations and digital economy policies so that the protection of intellectual works not only protects but also empowers creators as economic actors. Thus, Indonesia will not only become a market for global digital products but also a center for the production and distribution of digital works that are legally protected and economically valued sustainably.

Challenges in the Development of Digital Assets in Technology-Based Commercial Transactions

The development of digital assets in technology-based commercial transactions in Indonesia faces significant challenges due to the imbalance between digital technology advances and the unresponsive legal framework. The lack of regulations that specifically regulate new forms of digital assets, such as virtual assets, digital tokens, NFTs, and blockchain-based content, creates legal uncertainty in digital transaction practices (Febriyani & Tantimin, 2025). Although Law Number 11 of 2008 concerning Information and Electronic Transactions (ITE), in conjunction with Law Number 19 of 2016, has recognized electronic information and digital documents as valid evidence (Articles 5 and 6), there are no explicit regulations regarding the types and legal characteristics of these digital assets. As a result, this legal vacuum makes it difficult to protect the legal interests of business actors, consumers, and copyright owners in the digital space. Therefore, a more holistic and adaptive legal approach is needed to integrate conventional legal norms with new legal needs arising from the ever-evolving digital reality (Azizah, 2023).

The regulatory vacuum is also seen in the context of digital Islamic finance (Islamic FinTech), where there is no legal umbrella that comprehensively regulates the protection of digital assets in the Islamic banking system. In fact, the growth of Islamic FinTech in Indonesia is increasingly significant. Research by (Azizah, 2023) And (Rahman et al., 2021) shows that the absence of explicit regulations from Bank Indonesia and OJK causes weaknesses in legal protection for digital assets owned by consumers and Islamic financial institutions. This can create legal vulnerabilities in electronic contracts and the security of Islamic digital assets used in financing. Regarding the protection of personal data in digital transactions, Indonesia has passed Law No. 27 of 2022 concerning Personal Data Protection. This Law is an important milestone in efforts to protect people's personal information in the digital space. Article 4 states that everyone has the right to protection of personal data, both electronically and non-electronically. However, the implementation of this Law still requires more detailed regulations, especially in the context of digital assets and technology-based commercial transactions, including consumer protection on e-commerce platforms and digital financial services(Ahmad & Smith, 2024).

Philippe Nonet and Philip Selznick state that responsive legal theory states that Law must be able to adapt to the social, economic, and technological dynamics that develop in society. The Law should not be rigid or repressive but must be adaptive and open to change and function to protect public interests progressively. In this context, the challenges of regulating digital assets show that existing regulations in Indonesia, such as the ITE Law and the Copyright Law, are not yet responsive enough to new forms of technology, such as crypto assets, NFTs, smart contracts, and cross-platform digital transactions. Therefore, Indonesian Law needs to be updated to be responsive to the needs of a modern digital society while maintaining the principles of justice and the protection of rights.

In addition, the development of cryptocurrencies such as Bitcoin also faces an unclear legal position in Indonesia. Although not recognized as legal tender, regulations on crypto assets are still unclear and have the potential to endanger economic stability and investor protection (Arminanto & Firmansyah, 2022). Serta (Handoko et al., 2021) stated that the lack of legal certainty regarding the legal status of cryptocurrency has created ambiguity in the supervision and legal protection of these digital assets, both in terms of tax, contracts, and consumer protection. In Bappebti Regulation No. 8 of 2021, crypto assets have been recognized as commodities that can be traded on futures exchanges. However, until now, crypto assets have not been recognized as legal tender according to Law Number 7 of 2011 concerning Currency. In Article 1 number 1 of the Law, it is emphasized that the only

legal tender in the territory of the Republic of Indonesia is the Rupiah. This means that digital transactions using crypto do not yet have a strong legal basis as a means of exchange, even though they are recognized as commodities.

In terms of protection against cybercrime and digital-based money laundering, Indonesia refers to Law Number 8 of 2010 concerning the Prevention and Eradication of Money Laundering (TPPU). However, this Law does not explicitly regulate the use of virtual assets or transactions in the gaming economy as a medium for money laundering. Therefore, an amendment or development of regulations is needed that can include digital instruments as part of the monitoring objects by PPATK and law enforcement officers (Rusdiana et al., 2024). Meanwhile, in the digital contractual aspect, the use of smart contracts in commercial transactions still does not have a legal basis. In fact, in practice, many digital-based business actors use blockchain-based automatic contract systems. The ITE Law does provide space for electronic contracts but has not regulated the details of validity, dispute mechanisms, or error criteria in smart contracts. Therefore, it is necessary to update the national contract law (Civil Code) and strengthen the ITE Law so that it can clearly accommodate digital innovations like this (Maddusila et al., 2024).

Therefore, clear, firm, and adaptive legal protection is needed for the dynamics of digital technology development. This is in line with Satjipto Rahardjo's view in the Theory of Legal Protection, which states that the Law must be able to protect individual rights and the interests of society from various forms of threats, including those arising from advances in information technology. Ideal legal protection includes preventive (prevention), repressive (action), and rehabilitative (restoration of rights) aspects (Rusdiana et al., 2024). In the context of digital assets, this theory becomes very relevant because many digital economy actors - such as online-based MSMEs, content creators, and crypto asset owners - still do not receive adequate protection for their intellectual property rights, personal data, and digital transactions. Therefore, the implementation of regulations such as the Copyright Law and the Personal Data Protection Law (UU PDP) needs to be strengthened in order to be able to answer the challenges and legal risks that develop in the digital era comprehensively and fairly (Mayana et al., 2021).

Finally, in the aspect of digital taxation, PMK No. 69/PMK.03/2022 and PMK No. 60/PMK.03/2022 have tried to answer the need for taxation of foreign digital products and domestic digital transactions. However, this regulation still faces challenges in its implementation, especially in detecting cross-border transactions and utilizing big data for tax collection (Andikara et al., 2022). Therefore, a taxation system that is adaptive to the digital economy does not depend on the physical presence of business entities but

is based on digital activities and data. The next challenge arises from technical and operational aspects, including the implementation of smart contracts in e-commerce. Although smart contracts offer efficiency, they often cause legal uncertainty when there are technical errors or system failures. Studies (Hendry et al., 2024) emphasize the need for special regulations that can provide legal clarity and protection to the parties in the digital contract. In addition, digital payment systems such as GoPay and OVO also face accessibility barriers and regulatory inequality that can hinder the expansion of financial inclusion (Fisabilillah et al., 2024).

Another big challenge is protecting personal data and taxing the digital economy. The Indonesian legal system is still not fully ready to regulate data protection in an ever-growing digital ecosystem. Meanwhile, the issue of taxation on cross-border digital activities also does not have an effective monitoring system, as stated by Andikara et al. (2022). Therefore, it is necessary to strengthen regulations on personal data protection and taxation schemes that are able to reach digital transactions across jurisdictions fairly and efficiently. Without comprehensive legal reform, these challenges could hamper the growth of an inclusive and sustainable digital economy in Indonesia. In an effort to provide a comprehensive legal basis for digital assets in commercial transactions, it is also important to review the existence of Law Number 28 of 2014 concerning Copyright, especially in relation to digital works and the exclusive rights of their owners in the internet realm (Mayana & Santika, 2022). Although this Law has recognized digital works as objects of protection, its implementation still faces serious obstacles in the context of digital platforms. The provisions in Articles 25 to 28 that regulate the economic rights of copyright holders do not yet cover digital duplication by third parties on technology-based platforms in detail. This weakens the legal position of digital creators in dealing with piracy, unauthorized distribution, and commercial exploitation through online media such as social media, NFT marketplaces, and e-commerce (Syahrehan Ibnu Usman, 2025).

In addition, sectoral regulations issued by Bank Indonesia and the Financial Services Authority (OJK) also play an important role in supporting the protection of digital assets, especially in the financial and financial technology sectors. For example, POJK No. 13/POJK.02/2018, Digital Financial Innovation became an initial reference to ensure the security of digital transactions. However, this regulation has not yet touched on the smart contract-based dispute resolution mechanism or legal protection for digital tokens as part of blockchain-based project financing (Putranti et al., 2025). In fact, more and more digital business actors are utilizing digital assets as innovative financing instruments that are not yet known in the conventional legal system. To respond to all of these challenges, regulatory

updates need to be carried out through harmonization between laws and the preparation of a special Digital Asset and Blockchain Technology Bill. The formulation of this new regulation can align with the role of Law in protecting, supervising, and empowering digital assets across sectors. The presence of a special law will be an important instrument in preventing overlapping authority between institutions, ensuring legal certainty for digital actors, and encouraging innovation-based economic growth (Hufron et al., 2024). Thus, Indonesia's legal approach to digital assets must move from being merely responsive to being progressive and anticipatory of the rapid development of technology.

The formation of new regulations is also important to strengthen the institutional infrastructure that handles digital assets, both in terms of supervision, law enforcement, and empowerment of digital economy actors. Collaboration between Bank Indonesia, OJK, the Ministry of Communication and Information, and the Directorate General of Intellectual Property needs to be improved through an integrated cross-sector coordination system, including in terms of the formation of a single national data of digital assets, monitoring blockchain transactions, and the formation of a technology-based digital dispute resolution system (Handoko et al., 2021). This is in line with the concept of modern governance that demands the role of the state as a facilitator and regulator that is adaptive to technological developments, not just as a repressive controller. On the other hand, community empowerment in facing the digital era must also be a primary focus. Protection of digital assets is not enough to rely only on a normative legal approach; it also requires increasing digital literacy and legal understanding of the community, especially for MSMEs, content creators, and users of digital financial services (Lumbanraja & Khasanah, 2022). With good literacy, people will be able to protect their rights while encouraging the creation of a safe and just digital environment. Therefore, the regulations that are drawn up must be based on the principles of inclusivity and digital justice so that all levels of society can feel the benefits of technological developments in a sustainable manner.

4. Conclusion

Legal protection of Copyright as a digital asset in technology-based commercial transactions in Indonesia is still not optimal due to the lag in regulations from the very rapid development of digital technology. Although Law Number 28 of 2014 concerning Copyright and a number of other regulations have become the legal basis, they have not been able to accommodate new forms of digital wealth such as NFT, smart contracts, and other digital assets. Low legal literacy in the community, weak law enforcement, and lack of coordination between institutions have also exacerbated this condition. Therefore, comprehensive legal reform is needed, adaptive to technology and equipped

with the support of digital infrastructure and competent human resources so that the copyright protection system can provide legal certainty, encourage innovation, and protect the interests of digital economy actors fairly and sustainably.

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