Optimizing the Use of Smart Contract to Protect Moral Rights of Songwriters on Over-The-Top Platform in Indonesia

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Abstract: The rapid development of technology and information has created new dynamics in the creative music economy. The emergence of over-the-top (OTT) platforms as global distribution channels has increased accessibility, but also raised significant challenges regarding copyright protection, particularly the moral rights of songwriters. These issues are exacerbated by the widespread use of digital content without proper attribution and the unauthorized modification of original works. In this context, blockchain technology offers an innovative solution by providing transparency, security, and automation through smart contracts. This study employs a normative juridical method, analyzing primary legal sources such as Law No. 28 of 2014 on Copyright, along with secondary sources including journals and relevant literature. The findings indicate that smart contracts can enhance the protection of moral rights, especially attribution and integrity rights, by automatically embedding the creator's identity and restricting unauthorized alterations. However, their implementation in Indonesia faces regulatory challenges due to the absence of specific legal provisions governing digital copyright protection. Therefore, Indonesia may adopt a framework similar to the Digital Millennium Copyright Act (DMCA), particularly its anti-circumvention provisions. Furthermore, effective implementation requires collaboration between the government, songwriters, and OTT platforms to ensure legal and practical enforcement.

Keywords : Blockchain, Smart Contracts, Moral Rights, Digital Copyright, OTT Platforms

INTRODUCTION

The rapid development of technology, information, and communication has brought numerous changes in human behavior patterns. Information consumption patterns are shifting towards digitalization (Ramli et al., 2023). These digital developments have also led to changes in the creative economy sector. The creative economy itself relies on ideas, knowledge, and creativity sourced from humans as the main production factors (Mayana & Santika, 2023). The creative economy has also proven to contribute a lot to a country's economy. This phenomenon occurred in South Korea with the group Bangtan Sonyeondan (BTS). Thanks to BTS's worldwide popularity, the music group contributed US$4.65 billion to South Korea's Gross Domestic Product (GDP). This income makes

BTS's contribution to the South Korean economy equivalent to that of conglomerates such as Samsung (Fauzia, 2021).

The creative economy can continue to grow thanks to technological advances and the internet. The development of information and communication technology in Indonesia has become one of the variables in Law Number 28 of 2014 concerning Copyright (Copyright Law). Information and communication technology has a strategic role in the development of copyright, however on the other hand, it is also a tool for legal violations in this field (Penjelasan Umum Undang-Undang Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta (Alinea Kedua), 2014). In the digital era, the simplest form of convenience is provided by digitally accessible products, services, and places (Cahyadini, 2024). One form of this innovation is the existence of Over-the-top (OTT) services, which are delivered via the internet (Muhammad et al., 2025). In practice, these services take the form of Spotify, YouTube Music, JOOX, etc., which allow users to listen to songs by favorite musicians without being limited by space or time.

With the emergence of an economic breakthrough in the digital era, significant challenges related to copyright protection have also arisen. Issues related to copyright protection have grown alongside the widespread use of OTT platforms that facilitate the global distribution of music. Singers today find it very easy to publish their work so that the public can hear it. However, with this ease, anyone can use, take, duplicate, or modify other people's song creations and then upload them to OTT service platforms (S. A. A. Zahra et al., 2024). There have been several controversies related to moral rights violations in OTT services. One of them is the dispute between PT. Aquarius Pustaka Musik and Bigo Technology Ltd, as the manager of the digital application platform "Likee", regarding alleged copyright infringement. The dispute was registered with the Commercial Court under case number 60/Pdt.Sus-Cipta/2021/PN Niaga.Jkt.Pst. This dispute arose because the "Likee" application used 168 songs owned by PT. Aquarius *Pustaka Musik* without permission. The songs owned by PT Aquarius Pustaka Musik were used as material for short videos uploaded on the "Likee" application, where the "Likee" platform was deliberately created to be a container or repository for these short videos in order to attract or entice as many users as possible so that the number of "Likee" app users would increase sharply, from 80.7 million in the second quarter of 2019 to 150 million in mid-2020. This illegal use certainly violates the rights of PT Aquarius *Pustaka Musik* and also the creators of each song used in the application. This is because using songs without permission violates the creators' moral and economic rights.

In response to this problem, there is a need for new technological innovations that can protect creators while also providing space for the public to freely enjoy creative works. This has led to the emergence of smart contract technology, which offers a new paradigm with the potential to overcome fundamental weaknesses in Indonesia's existing system. Data shows that more than 2 million smart contracts have been implemented on the Ethereum platform. A smart contract is a computer program that automatically executes, controls, or documents events and actions in accordance with the terms of a pre-agreed contract. All recorded transaction data will be incorporated into a block that is interconnected with other blocks and cannot be changed. In practice, smart contracts can function as "digital deeds" that permanently record and register copyright ownership of a song, including clear attribution to the song's creator and related rights holders. This data is stored in an immutable distributed ledger, providing strong and non-repudiable evidence of ownership.

Several previous studies, such as those by Muhammad Dzaky Agusman and Fathoni, entitled "*Perlindungan Hak Cipta Berbasis NFT dan Smart Contract dalam Menanggapi Isu Pencurian Suatu Karya Digital*," published in 2025, explain the use of smart contracts and NFTs to protect copyrights. The research proves that smart contracts can strengthen copyright protection because they are more adaptive, transparent, and efficient than the conventional mechanisms currently in use (Agusman & Fathoni, 2025). This application is efficient because it allows creators to permanently document ownership and manage distribution rights and royalties without relying on third parties (Agusman & Fathoni, 2025). However, this study does not explain its implementation in the Copyright Law and focuses only on technological implementation, leaving room for discussion regarding its legal implementation. Then there is a study conducted by Galuh Adeatris Hizkia Sutrisno and Made Aditya Pramana Putra in 2025 with the title "*Peran Teknologi Blockchain dalam Perlindungan Hak Cipta: Peluang dan Tantangan di Indonesia*" which also reinforces the use of blockchain for permanent protection of copyright ownership and to make it difficult to manipulate, in line with Law No. 11 of 2008 concerning Electronic Information and Transactions as amended by Law No. 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Information and Electronic Transactions, which was then amended again through Law Number 1 of 2024 concerning the Second Amendment to Law Number 11 of 2008 concerning Information and Electronic Transactions (ITE Law) and the Copyright Law (Sutrisno & Putra, 2025). However, the study did not specifically explain the protection of moral rights for songwriters. The third study was conducted by Sebastian Situmorang and Tomy Michael, published in 2025 with the title "*Reformasi Pengelolaan Royalti Musik: Menuju Sistem yang Adil dan Transparan bagi Pencipta Lagu*" It also discusses the possibility of using smart contracts to improve the efficiency of royalty payments, thereby reducing operational costs and speeding up the distribution process (Siitumorang & Michael, 2025). However, this study does not specifically address the protection of songwriters' moral rights, especially on OTT platforms.

Furthermore, the author's research complements previous studies by explaining how the smart contract system revolutionizes the royalty distribution mechanism by automating the payment process in real time and transparently. Therefore, this study aims to answer questions about the legal potential and implications of using smart contracts as an innovative instrument for copyright protection and the enforcement of the economic rights of songwriters in the digital music industry.

METHOD

In this paper, the research method is normative legal research. This approach is carried out by referring to the analysis of applicable laws and regulations relevant to the legal issues at the focus of the research (Sunggono, 2002). Normative legal research is also known as a literature review because it is conducted using primary and secondary legal materials. The primary legal material used is Law Number 28 of 2014 concerning Copyright. The secondary legal materials used in this study are prior legal journals and books relevant to intellectual property rights protection, particularly copyright.

RESULTS AND DISCUSSION

A. Blockchain and Smart Contracts in General

Blockchain is a technology characterized by decentralization, transparency, and high security, which enables transactions to be carried out quickly, validly, and with minimal risk of tampering. Initially used for digital currencies such as Bitcoin, its application has now expanded beyond the

cryptocurrency and economic sectors (Iswanto et al., 2022). Blockchain enables fast and efficient transaction verification and validation without intermediaries, thereby reducing costs and improving data security (Cindy et al., 2025). This is essentially because Blockchain permanently records all transactions in a public database called a ledger. All recorded transactions are stored in blocks and distributed in a peer-to-peer network (Cindy et al., 2025). These stored blocks use cryptography and eliminate redundant data across the network, thereby reducing the risk of data failure or corruption (Febriana et al., 2024).

Blockchain is a form of Distributed Ledger Technology (DLT), which is decentralized and uses a consensus protocol to reach agreement when managing existing databases. However, there is a difference between blockchain and DLT. This difference lies in the blockchain database structure, where every recorded transaction is incorporated into a block that is linked to other blocks and cannot be changed. This data security technique is called encryption, which converts data into a specific format that can only be accessed through a password. Blockchain uses an asymmetric key encryption system, where each user has a public key for transaction identification and a private key for authorization. The public key is public, while the private key must be kept confidential and can be used to send confidential data or to sign digital messages (Hasya et al., 2024). Research conducted by Benedicta Chrestella Haryono et al. also found that the public keys generated by smart contracts are unique and diverse. Therefore, only the parties involved and those who signed the smart contract have access to the authentication key, thereby ensuring the security and validity of transactions (Haryono et al., 2025).

The blockchain system has developed in three stages, namely blockchain 1.0, which focuses on digital currency; blockchain 2.0, which is applied in the financial and economic sectors; and blockchain 3.0, which leads to a digital society (Rukman et al., 2025). In this development, smart contracts emerged in the blockchain 2.0 phase as automatic digital contracts that can be executed without direct human involvement. The use of smart contracts in the modern era is often found on e-commerce platforms. Real-world examples of smart contract usage are often found in Non-Fungible Tokens (NFTs). NFT assets provide creators with the opportunity to trade their digital works using smart contracts that specify the parties entitled to receive a share of the profits from NFT sales and the distribution amount (Tanvee et al., 2024). The information provided avoids ambiguity and ensures that every clause in the contract is executed by both parties.

Smart contracts are defined as "legal agreements or relationships conducted electronically by combining a network of computer-based information systems with network communication systems and services" (Makarim, 2003). Based on this definition, smart contracts are transparent. This transparency in blockchain technology allows all parties involved to view and verify transactions directly, thereby reducing the potential for conflict and misunderstanding arising from human subjectivity (Martinelli et al., 2024). In terms of security, the decentralized structure supported by blockchain's encryption system also reduces the risk of data manipulation and fraud. The terms agreed upon in the contract will also be executed automatically on a distributed network (Kurniawan et al., 2025). The blockchain system also has metadata that records every party that accesses the document, thereby ensuring compliance with the terms stated in the agreement (M. S. Zahra et al., 2025). Smart contract agreements are made digitally and stored in the blockchain, so that any changes or implementations of the agreement can be verified through a permanent digital trail without the risk of data falsification by certain parties (M. S. Zahra et al., 2025).

The smart contract system works through the parties' agreement to use the contract for digital transactions, which are then recorded on the blockchain. This nature of agreement can be categorized as fulfilling one of the requirements for a valid agreement, namely the element of agreement. In general, in research conducted by Jecelyn Amanda Dethan and Yerica Evadne Giraldani Irianto, the way smart contracts work depends on blockchain technology. A smart contract begins with the drafting of programming code that contains the terms of the agreement as agreed upon by the parties. The code is then uploaded to the blockchain system as the basis for executing the transaction and is automatically recorded in the network. After that, the parties initiate the contract by agreeing to use the smart contract as the basis for their agreement. Next, the contract will be executed automatically when the conditions specified in the smart contract are met. In the final stage, the results of the transaction will be recorded permanently, transparently, and verifiably on the blockchain by the parties to the agreement (Dethan & Irianto, 2024).

Metadata stored on the blockchain can also be used as valid electronic evidence in court, as recognized under the provisions of the ITE Law (M. S. Zahra et al., 2025). Government Regulation (PP) No. 7 of 2019 concerning the Implementation of Electronic Systems and Transactions (PP PSTE) also emphasizes that electronic data can be used as legal evidence in court if its validity can be proven (Melisa & Syuryani, 2026). This innovation brings about a more efficient agreement system compared to conventional agreements or contracts while still providing legal certainty.

In practice, smart contract systems that utilize blockchain can also be used as protection in the intellectual property rights sector (Iswanto et al., 2022). Based on research conducted by Muhammad Ismail et al., it was found that the blockchain system used for smart contracts supports the CIA (Confidentiality, Integrity, Availability) information security principles. Data integrity is guaranteed because the system verifies user credentials through blockchain with a hundred percent success rate (Ismail et al., 2025). Similar implementations can also be applied to protect the moral rights of songwriters so that their creative works are not misused by irresponsible parties.

B. Moral Rights as Part of Copyright

The fundamental aspect of copyright is that it is a concept of ownership that allows for the protection of a person’s work (Razak, 2023). Protected works are expressions of ideas that are published to the general public through various media. Copyright protection safeguards creators against potential plagiarism and encourages people to create. This protection makes creators feel secure because they have a tangible return on the time and energy they put into their creativity. The principle of copyright protection has one specific principle found in the Berne Convention: Automatic Protection, which means that protection of copyrighted works arises immediately upon announcement or publication, and copyright may or may not be registered (Marali & Nugroho Putri, 2022). The principle of the convention means that every creation is automatically protected, and no entity can commit piracy without the creator’s permission. Copyright protection also requires originality. A work that is to be protected must be the result of the creator’s own creativity and not merely imitate the work of others. However, under positive law in Indonesia, namely the Copyright Law, several flexibilities or exceptions are granted in the fields of education and scientific development. This flexibility is provided so that knowledge can continue to develop without restrictions from any party. However, this freedom in education must still be accompanied by the moral obligation to cite the

original creator when quoting. This behavior is consistent with moral rights, which are at the core of exclusive protection under the Copyright Law.

As stipulated in Article 4 of the Copyright Law, which states that "Copyright as referred to in Article 3 letter a is an exclusive right consisting of moral rights and economic rights" (Pasal 4 Undang-Undang Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). Basically, copyright is the right to copy a work legally or to enjoy it without violating the creator's economic and moral rights (Sudaryat, 2024). Moral rights and economic rights each have their own role in protecting creators. Economic rights, as referred to in the Copyright Law, relate to the right to obtain economic benefits from the creation in the form of royalties due to the publication and commercial use of the work (Hamdi & Leviza, 2024). Economic rights can then be transferred to other parties through inheritance, grants, written agreements, or licenses. Furthermore, provisions regarding moral rights are further regulated in Articles 5-7 of the Copyright Law, which essentially state that these rights include the right to include or exclude one's name on copies in connection with the public use of one's work, and the right to use a pseudonym or alias (Pasal 5 Ayat (1) Huruf a Dan b Undang-Undang Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). Unlike economic rights, moral rights cannot be taken away from the creator for any reason, even if the economic rights have been transferred to another party. Moral rights are rights that are inseparable from the work and the creator, or can also be interpreted as the integrity of the creator (Herlambang & Dewi, 2025). The inseparable nature of moral rights is based on the theory of personification, which states that a work of authorship is an extension of the creator's personality itself, so it cannot be completely removed from the creator.

An understanding of moral rights is also expressed by an author named Debois in his book Le Droit d'auteur, which states that there are four meanings, namely (Komen & Verkade, 2019): a) droit de publication: the moral right to publish or not publish one's work; b) droit de repentir: the right to make changes deemed necessary to the work and the right to withdraw the work from circulation once it has been published; c) droit au respect: the right to refuse to allow changes to be made to the work by other parties; and d) droit à la paternité: the right to include the creator's name; the right to refuse to allow

In essence, moral rights are simplified to include two important things, namely the right of integrity and the right of attribution. The right of integrity is an action to avoid the loss of the creator's integrity by prohibiting changes or damage to their creation. This right is realized through a prohibition on altering, reducing, or damaging the creation in a way that could demean the creator's integrity. An example of a violation of the right of integrity is changing the lyrics of a song, which alters the meaning of the original lyrics written (Naqsyabandi et al., 2023). Meanwhile, the right of attribution includes the inclusion of the creator's identity or pseudonym on their creation or, in certain circumstances, at the creator's own discretion, the identity may be omitted so that the work becomes anonymous (Naqsyabandi et al., 2023).

In its implementation under Indonesian positive law, Article 6 of the Copyright Law states that moral rights also allow creators to access copyright and copyright management data (Pasal 6 Undang-Undang Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). This provision is then clarified in Article 7 of the Copyright Law, which states that copyright management data includes information used to identify and verify the authenticity of a work, including various data and codes related to access to the work (Pasal 7 Ayat (1) Undang-Undang Republik Indonesia Nomor 28 Tahun

2014 Tentang Hak Cipta, 2014). The management of creations requires digital data that quickly lists key information about a work, such as the creator's identity, the party holding the copyright, the duration of protection, the terms of use for the work, and the work's identification number. This information plays an important role in ensuring that every use of the creation acknowledges the creator's rights and complies with applicable laws and regulations.

Therefore, copyright management data should not be deleted, altered, or manipulated illegally, as this could harm the creator and violate copyright law. In this context, the use of smart contracts is highly relevant, as they can automatically record and manage copyright information transparently and in a way that is difficult to manipulate.

C. The Use of Smart Contracts in OTT Services in Indonesia

Based on several studies collected by Loso Judijanto et al., it was found that even though Indonesia has a legal framework governing copyright, many creators still believe that law enforcement is not yet optimal (Judijanto et al., 2024). The law enforcement process is often considered ineffective and unresponsive to violations occurring on digital platforms. Therefore, the use of smart contracts to enforce the copyright system can improve legal integrity, especially in the eyes of creators.

A smart contract is an integrated system that does not require a third party. Every claim process can also be processed more easily and quickly, without the need to follow a lengthy traditional process. Furthermore, a dissertation written by Ruth Brennan states that the use of smart contracts can be beneficial because they provide a fully available and unalterable transaction history (Brennan, 2022). In its implementation, this system seeks to include clear additional information in each transaction, such as payments that directly reference applicable licenses, and to store voucher details in market contracts for tokens to be printed. In addition, this system also generates event logs from token contracts and market contracts that record transaction details and can be easily traced through blockchain explorers such as Polyscan. This application also ensures transparency by displaying the details of each transaction that has been approved or signed through the use of digitally readable naming, storage, and data structures (Brennan, 2022).

Furthermore, data security and integrity are guaranteed by the content-addressing system on IPFS (InterPlanetary File System), which prevents metadata and audio files from being replaced unilaterally. This ensures that the integrity of copyright references is maintained. IPFS also uses cryptographic hash-based content addressing, or Content Identifier (CID), to ensure data integrity and enable distributed replication, thereby reducing the storage burden on the blockchain while maintaining audit transparency. The integration between blockchain and IPFS enables secure, scalable, and easily accessible storage of genetic data by authorized parties without dependence on centralized infrastructure (Famuji et al., 2025).

Smart contracts can also facilitate tracking of ownership and trading through a tokenization process that represents copyright ownership as tokens. This application facilitates the creation, management, and trading of tokens, as well as the implementation of access control mechanisms to ensure ownership autonomy. This greatly supports the protection of the moral rights of songwriters so that there are no misattributions. So when a song is registered in the blockchain system, the creator's data (such as real name, alias, and other contributors) is engraved in an immutable ledger. Each song unit also has a unique ID that is directly linked to the creator's Public Key. So every time

a song is accessed or traded, the creator's identity is always attached and verified by the network. Thus, the potential for data manipulation related to ownership of the work or removal of credit to the creator can be significantly minimized. This transparency not only strengthens the protection of the creator's moral rights but also increases the accountability of OTT platforms in managing works circulating within their ecosystem.

Furthermore, moral rights include the right to prohibit any modifications to a work. Through the utilization of smart contracts, a framework is established that mandates explicit authorization from the author to safeguard the integrity of the creation. The underlying code can be structured such that any unauthorized alterations to a song are rejected by the network, thereby facilitating the detection of forgeries. Fundamentally, the cornerstone of moral rights lies in verifying the authorship of a song; a blockchain-based system provides this through a permanent ledger that secures the initial record of the creator, which in turn reinforces legal positions during disputes and enhances the documentation of a work's original author. So that, using smart contracts, a system is formed that requires direct permission from the creator to prevent violations of the work's integrity. This is because the code can be designed so that any modification of a song without the creator's consent is not recorded as valid in the network, making it easy to detect counterfeiting. In essence, the most important aspect of moral rights is the proof that a song belongs to its creator. The use of a blockchain system will provide proof of ownership, as blockchain's permanent ledger guarantees the initial recording of the song's creator, strengthening legal claims in the event of a dispute. Thus, this system optimizes the recording of the first creator of a creative work.

Based on previous research, the implementation of smart contracts within the Indonesian legal framework still faces several obstacles, particularly in relation to existing regulations. National regulations are considered not to yet explicitly regulate the recognition of blockchain-based contracts or smart contracts in the context of copyright protection. Smart contracts in Indonesia can indeed be considered valid as long as they comply with the standards set out in legislation, such as the Law Number 8 of 1999 concerning Consumer Protection and Law Number 11 of 2008 concerning Electronic Information and Transactions. However, many other parties continue to question the validity of Smart Contracts because they are still considered illegal or unregulated (Indahcantika Mazalio, 2023). Based on this research, it is recommended that clear, comprehensive laws governing Smart Contracts be enacted in Indonesia to ensure legal certainty and accelerate the development of blockchain technology. However, when assessing a law, the assessment cannot be made simply by looking at the explicitly written regulations. As a legal basis Article 1320 of the Civil Code explains that the requirements for a valid agreement are mutual consent, competence, a specific subject matter, and a lawful cause. Smart Contracts in this context can still meet these four elements and be categorized as contracts with legal validity. In addition, the use of smart contracts remains possible under the principle of technological neutrality in the ITE Law. Furthermore, the automatic nature of smart contracts can be categorized as Electronic Agents as regulated in Article 1, paragraph 8 of the ITE Law (Asri & Bagus, 2025). On the other hand, the Copyright Law also recognizes the existence of digital-based security technology, as stated in Article 53 of the Copyright Law: "Creations or Related Rights products that use production and/or data storage facilities based on information technology and/or high technology must comply with the licensing rules and production requirements set by the competent authority".

In addition to issues in national regulations, it is considered that the integration of OTT platforms with smart contracts still requires international standardization. International standardization is important to implement because the nature of OTT services is cross-border. This nature requires legal harmonization between national contract law systems and global instruments such as the Digital Millennium Copyright Act (DMCA) in the United States. Through research conducted by Wahyudi, it was found that the Indonesian government could follow the US policy model, which appoints financial institutions used in a smart contract to retain or store data for a certain period of time, accompanied by regulations regarding data access rights (Warianto et al., 2024). Indonesia can also emulate the DMCA, which introduces anti-circumvention provisions and prohibits the distribution of tools designed to circumvent copyright protection technologies (Khansa & Safiranita, 2025). The application of anti-circumvention is a form of strengthening and respecting international agreements that have been ratified in Indonesia, such as the WIPO Copyrights Treaty (WCT), which Indonesia ratified through Presidential Decree No. 19 of 1997. The anti-circumvention principle specifically prohibits the act of circumventing, outsmarting, or distributing tools designed to disable such security technology. Adopting this principle in the Indonesian Copyright Law can provide strict legal sanctions against any attempt to manipulate copyright codes or metadata on the blockchain, thereby increasing the effectiveness, security, and legal certainty for song creators on OTT services. However, the effectiveness of a DMCA-based approach cannot be guaranteed due to the lack of integration between national laws and digital platforms' practices (Arwana, 2025).

In addition to the regulatory sector, the government is also collaborating with technology companies such as Netflix, Apple, and Amazon to ensure that Digital Rights Management (DRM) is consistently implemented across various sectors (Khansa & Safiranita, 2025). In applying DMCA principles, Indonesia faces legal challenges, particularly in developing a more flexible and effective mechanism to combat copyright infringement in the digital realm (Fahleni et al., 2025). This is because the legal systems in the United States and Indonesia differ: the United States applies common law, while Indonesia applies civil law. The United States, which applies the principles of common law, can implement regulations more flexibly (Fahleni et al., 2025), Indonesia still needs to conduct further studies to draft a comprehensive written law to address societal issues. However, for issues related to the implementation of the DMCA, Indonesia can draft digital copyright regulations in cooperation with OTT platforms to create a service industry that protects and respects Indonesian creative works through a relevant system. Indonesia also needs to build a more robust technological infrastructure, especially regarding internet connectivity, access speeds, and the availability of hardware needed to support smart contract technology (Suwandi, 2025).

Therefore, the use of smart contracts to protect songwriters' moral rights can be implemented in accordance with the Copyright Law. The law has never directly rejected the existence of technology that can help improve legal protection. Therefore, smart contract technology can be used to strengthen legal certainty, reduce attribution disputes, and provide strong evidence regarding the creation and distribution of works. With the synergy between legal regulations and technological innovation, Indonesia can build a copyright protection system that is more modern, adaptive, and in line with the dynamics of the digital era.

D. Protection of Songwriters' Moral Rights in OTT Services

As intermediaries in music distribution, OTT services are obligated, as stated in the Circular Letter of the Minister of Communication and Information Technology of the Republic of Indonesia Number 3 of 2016, to comply with applicable laws and regulations, including those on intellectual property rights. However, the large number of copyright infringement cases, such as unauthorized cover activities, remixes, and piracy in the digital era, shows that many OTT services have not fully fulfilled their obligations. This phenomenon violates both the moral and economic rights of creators as stipulated in the Copyright Law. These violations are rampant in Indonesia, as evidenced by the country's inclusion on the PWL list of countries with a high level of intellectual property violations, which has led creators to lose interest in further developing their creations or inventions (Girindra, 2023). The prevalence of song copyright violations stems from many people not understanding the value of copyright. Based on research conducted by Dahlia and Citra Ramadhan, a survey found that even among students, there is still a lack of acceptance of the law in their daily behavior (Dewi & Ramadhan, 2023). Another problem is that the inclusion of moral rights as credits is often limited to text that can be deleted or ignored. Songwriters who experience problems related to moral rights can resolve disputes through litigation and non-litigation channels. Collaboration between the government, LMKN, digital platforms, and creators is necessary to create a digital ecosystem that respects intellectual property rights.

Furthermore, under Indonesian positive law, Article 95 of the Copyright Law provides that copyright disputes are handled through alternative dispute resolution, arbitration, or the courts (Pasal 95 Ayat (1) Undang-Undang Negara Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). Meanwhile, litigation can be carried out in court, namely the Commercial Court (Pasal 95 Ayat (4) Undang-Undang Negara Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). However, before resorting to litigation, mediation must be attempted first, except in cases of copyright and/or related rights infringement in the form of piracy, provided that the parties to the dispute are known to exist and/or are located within the territory of the Republic of Indonesia (Pasal 95 Ayat (4) Undang-Undang Negara Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). The settlement of copyright disputes through litigation and non-litigation will take a long time and incur considerable costs. Therefore, copyright issues should be resolved through preventive measures or by accelerating the resolution process.

With the implementation of smart contracts, a system is formed that uses automation without involving third parties. OTT no longer functions only as a host but as an ecosystem subject to automated rules that guarantee the recognition of the creator's rights. For example, every time a song integrated with blockchain is played on Spotify, the system will automatically display the creator's name based on the data in the smart contract. Even if the song is covered or remixed by other users, the smart contract will still list the original creator, maintaining the integrity of their moral rights. The advantage of smart contracts, which are not tied to third parties, is that credit requests can be made quickly, without waiting for lengthy bureaucratic processes. With the speed of the copyright claim process, disputes can be resolved more quickly and provide legal certainty for songwriters. In addition, using a smart contract system can build trust in the system created because it does not rely entirely on humans, who can be subjective. Songwriters can also feel more appreciated because each of their creations will include their names without the need to worry about misuse, such as unauthorized changes.

If Indonesia implements smart contracts for copyright protection, OTT services will also be required to adopt them to continue operating legally. In Indonesia, this can be linked to Article 15, paragraph 1 of the ITE Law, which states that PSEs must operate Electronic Systems reliably and securely and be responsible for their proper operation (Pasal 15 Ayat (1) Undang-Undang Republik Indonesia Nomor 11 Tahun 2008 Tentang Informasi Dan Transaksi Elektronik, 2008). The term "*Andal*" used in the ITE Law can be interpreted as having the capabilities appropriate for its intended use, and "operating as intended" means that the Electronic System has the capabilities, including the ability of the Electronic System to comply with or fulfill the obligations of Electronic System Management as regulated in the Legislation.

As long as OTT services do not make every effort to protect copyright, such services can be categorized as a form of negligence liability. Article 10 of the Copyright Law also states that "Managers of trading venues are prohibited from allowing the sale and/or reproduction of goods that infringe on Copyright and/or Related Rights in the trading venues they manage" (Pasal 10 Undang-Undang Republik Indonesia Nomor 28 Tahun 2014 Tentang Hak Cipta, 2014). In the realm of modern technology, this can be interpreted to mean that OTT services are also prohibited from allowing the reproduction of copyright infringements. In the realm of cyber law, this negligence can place OTT services in Indonesia in a position of secondary liability for failing to implement adequate protection, resulting in the redistribution of content without the creator's permission.

To avoid such behavior, both OTT services and the government need to tighten their security policies by implementing a digital system using smart contracts to prevent unauthorized re-uploading, as well as encryption to prevent illegal downloading. With these characteristics, the application of smart contracts serves not only as a technical tool for managing digital works but also as a regulatory instrument that ensures compliance with copyright principles.

The automated nature of smart contracts for protecting creators also supports the enforcement of the principle of automatic protection, originating in the Berne Convention for the Protection of Literary and Artistic Works. Therefore, integrating smart contracts into the OTT service ecosystem can be seen as one of the most relevant solutions to address the challenges of copyright protection in the digital age, especially given the high potential for violations through online content distribution.

CONCLUSION

Blockchain is decentralized, transparent, and secure, enabling it to create an immutable digital ledger that permanently records every transaction and copyright ownership. Blockchain uses encryption technologies such as asymmetric key encryption, ownership data, and transaction verification to ensure data authenticity. In the context of copyright, smart contracts can automatically include the creator's name (attribution rights) every time a song is used, preventing modification of the work (integrity rights) without the creator's permission, as any changes require approval recorded on the blockchain. However, the implementation of smart contracts in Indonesia is still considered to face challenges in the regulatory field. The national legal system does not yet have specific rules that explicitly recognize the use of smart contracts in the context of copyright protection. Therefore, clearer regulations, in the form of laws, are needed to create legal certainty. In addressing this issue, Indonesia can refer to several provisions of the DMCA on anti-circumvention and the prohibition of distributing tools designed to circumvent copyright protection technology. Indonesia can also

collaborate with OTT platforms to draft the Digital Copyright Law. By adopting this technology, Indonesia can build a more modern and adaptive copyright protection system in the digital era.

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