The Use of Blockchain Technology for Legal Protection of Copyright in Indonesia

Maya Ruhtiani

Universitas Jenderal Soedirman, Purwokerto, Indonesia
mayaruhtiani@uhb.ac.id

Abstract. Indonesia understands intellectual work as a basic concept of recognizing a work from a person's thinking power that requires recognition, respect and even protection as other assets with legal ownership. This shows that intellectual property rights exist by the presence of legal protection. This research examines the use of blockchain technology in protecting copyrighted works in Indonesia. The normative juridical research is used as an assessment on the application of positive legal norms or regulations applied in Indonesia. The results of this research show that the use of blockchain technology is applicable to be implemented in Indonesia and could be used as an implementation of Article 53 UUHC (Copyright Law). Blockchain technology is able to prevent Piracy/Plagiarism because it allows storing detailed information on copyrighted works including the information about the author and publication date of the copyrighted work. Also, blockchain technology is able to record the publication date of when copyrighted work first published.

Keywords: blockchain, copyright, legal protection, technology

1.   Introduction

Indonesia understands intellectual work as a basic concept of recognizing a work from a person's thinking power that requires recognition, respect and even protection as other assets with legal ownership. This shows that intellectual property rights exist when there is a presence of legal protection. The existence of intellectual property is considered very essential based on the relationship between humans and countries. The most important aspect in the protection of intellectual property is the legal and technological order which is currently causing various problems in the realm of intellectual property itself. Violations that often occur in society are those related to copyright, especially about intellectual property in the technology field. Copyright could easily be accessed via the internet especially on social media and could also be enjoyed by the public. The problem does not rely on the easy access by the public, but when the access is used for certain things that violate the copyright.

Exclusive rights are automatically owned by the creator or copyright holder in terms of regulating the use or the work and even the results of their own ideas that are accessible and used as information for the users. The author might provide restrictions on unauthorized access by someone to their work or to a work of their creation as an

implementation of their exclusive rights.[1] Indonesia established Law Number 28 Year 2014 concerning Copyright (hereinafter referred to as UUHC) which is a legal regulation relating to copyright, thus the protection of the creator is not harmed morally and economically.[2]

The law must provide protection and be used as a solution to problems in copyright area. This protection is carried out as an effort to develop the creative power of the community to create copyrighted works that could be recognized as a work of thought in the field of art and other works included in protected works as stated in UUHC. The legal aspect provides protection, but the technology aspect holds the same level of important as the legal aspect. Technology which is developing very quickly following international development makes fast access in the field of information conveyed to all corners of the country and the world. Along with this, the more sophisticated the technology, the more frequent violations occur, especially on copyrights uploaded via the internet because in the principle of copyright prioritizes publication of a work as proof of ownership. Publications made as proof of ownership such as uploading works on the internet have possibility to be used as opportunities by someone to exploit works without any rights which could be categorized as abuse or copyright infringement.[3] Digital content consisting of videos, films, songs, dramas, and writings (e-books) is copyright work uploaded on the internet and is often used by the public positively or negatively. On the positive side, the public could take advantage of the work by using them as an illustration to make similar works, but from the negative side, the work is imitated and even stolen or claimed as their own copyrighted work.

Seeing the rapid development of technology through the internet by offering various kinds of facilities, it indeed has become a necessity for today's society. The Minister of Communication and Information explained that the internet user community in Indonesia in 2021 reached 202.6 million people out of the total number of 272.2 million people, or it can be said that 75% of the population in Indonesia are active internet users.[4] Dissemination of copyrighted works is easier to do through the internet because it could be continuously disseminated and duplicated quickly, but the violations of copyrighted works could occur quickly and continuously as well, and even the access is not limited to the detriment of the original owner of the copyrighted work.

The abuse of copyright, especially in digital copyrighted works, can be minimized by utilizing current technology, one of which is using blockchain technology. The origin of blockchain technology can be traced back to a lack of trust in a single authority or what is commonly referred to as a database that has been traditionally used. The technology used in these databases was susceptible to abuse, and administrators could alter the data stored. However, using a consensus mechanism, implementing the decentralization concept in blockchain ensures that data must always be validated when there is a discrepancy with the majority of the data. The blockchain makes the transaction data way more secure since it generates a public key that has to be verified by all members.

It is widely used by developed countries and now starting to enter developing countries in various sectors such as asset, data management, infrastructure, health, and education. In Indonesia, blockchain technology has begun to be known and would be used as one of the protections for copyright, starting with the collaboration between the Creative Economy Agency with IBN (Indonesian Blockchain Network) and ABI (Indonesia Blockchain Association/*Asosiasi Blockchain Indonesia*).

Based on the discussion above, the researcher examined issues regarding copyright infringement and how blackchain technology can be a solution in preventing copyright infringement. The previous research related to copyright protection using blockchain technology entitled Application of Content Copyright Data Collection System Using Blockchain written by Chandra Lukita. In that research, he discussed the procedure for content protection with Blockchain technology. Compared to the previous research, this research is related to the use of blockchain technology to protect copyrighted works owned by creators as a proof of ownership based on publications that have been carried out. By using blockchain technology, the copyrighted work will be protected due to its high protection. Therefore, this research discussed about the role of the act on copyright protection in the field of technology.

2.   Problems

Based on the previous discussion, the question is how could we use blockchain technology in efforts to protect copyright law in Indonesia?

3.   Method

This article is researched using normative juridical research where in the discussion, this research prioritizes the study of the application of positive legal norms or legal rules applied in Indonesia as well as approaches through related laws and regulations. The approach in this research is carried out conceptually. The primary legal material consists of UUHC and the implementation of the rules stated in UUHC. Data analysis in this research was carried out qualitatively. Namely, the data obtained was compiled systematically and analyzed qualitatively to clarify the problems discussed. Qualitative data analysis is a research method that produces analytical descriptive data related to blockchain technology used as legal protection in implementing UUHC. The technique of collecting legal materials is a literature study which examines books as references and previous studies that are used to obtain theoretical foundations related to the problems to be studied.

4.   Discussion

4.1.   The Study on Legal Protection of Copyright in Indonesia

The legal protection are applied for books, pamphlets, speeches, lecture materials, sermon materials, manuscripts made for drama, drama in the form of musicals, dances, recorded music, songs, cinematography, drawings, paintings, architecture, and other copyrighted works as described in UUHC. In addition, the copyright protection for computer program as a form of knowledge is needed as regulated in the Berne Convention.[5]

Copyright as described by WIPO is also referred to as author's rights in most European languages other than English. The expression in copyright refers to literary and artistic creations that the creator can use with their own permission. Actions with the permission of the creator can be taken in the case of making copies of literary or artistic works. In addition, the rights of the creator are exclusive rights, for example the right to prevent the re-creation of deviant copyrighted works in the sense of changing the copyrighted work inappropriately without the will of the creator and other things that can only be done by the creator themselves. Meanwhile, the right to copy is obtained from the author who has given their permission to the publisher with the license.

Copyright conceptually accommodates the main elements which are the right to benefit and the right to the person who produces the copyrighted work. In this case, it is necessary to pay attention to the idea and originality or authenticity. Real works are the final embodiment that must be fulfilled by the creator in making copyrighted works and protection of copyrighted works will automatically exist if the copyrighted work has been formed and can be applied, not just a concept or idea in the head. When it is only a concept or idea without producing them into copyrighted works, then they cannot be protected.[6]

Indonesia adopts 3 (three) doctrines consisting of labor, personality and social control planning which are implemented in the Copyright Law.[7] The labor doctrine states that the creator is entitled to an appreciation as the rightful owner of the work he creates. Policy makers, in this case the government and related agencies, seek to provide copyright protection by implementing the doctrine of personality which is the determination of moral rights for creators. In addition, the existence of copyright protection is applied to the doctrine of social control planning, especially copyrights uploaded on the internet that can provide benefits to other people or the community.

4.2.   Overview on the Use of Blockchain Technology

Blockchain first appeared in 2008 when it was developed by Satoshi Nakamoto to solve the problem of double spending on a digital currency called bitcoin (Friedman and Ormiston, 2022). Nakamoto packaged it into a peer-to-peer electronic money system that uses a digital signature served as a timestamp of every transaction made. The distributed ledger on which bitcoin is based is blockchain technology that makes every transaction secure without the need for a central intermediary such as a financial institution.[8]

Blockchain technology is an open and distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent manner. [9] Blockchain is an innovation in computer technology that can store data in a distributed manner in a network by utilizing consensus algorithms and data encryption. [10] This distribution concept can store a copy of transaction data that has been stored in each block, so it is owned by all members of the blockchain network. This is very useful to always ensure the availability of information. If there is a change in data from one computer, then all computers that have a copy of the data will verify whether the data is changed with the correct procedure or not. Data that changes but does not comply with the agreement of all members is considered invalid data and will be ignored.[11] An illustration of the distribution of data in a blockchain network is in Figure 1.

Figure 1. *the Distribution of Blockchain Data*
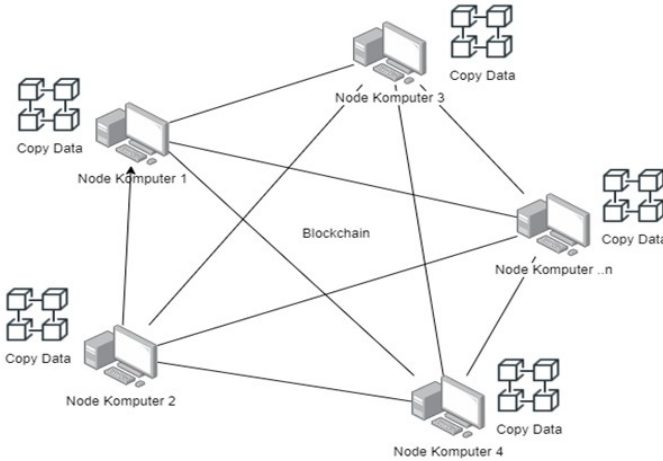
Data is stored in the form of blocks that are connected to each other to form a network chain.[12] The illustration in Figure 2 is how transaction information is stored in each of the blocks that are interconnected with an encryption code.

Figure 2. *Block Structure*
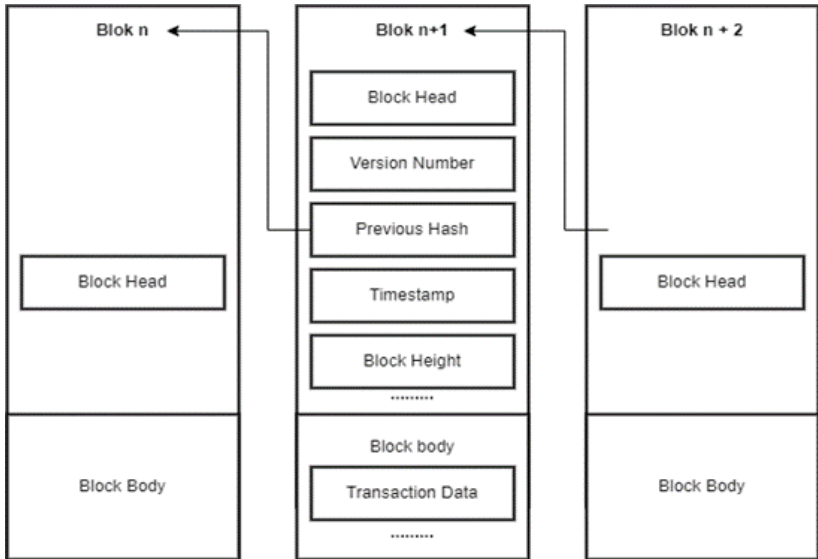
Based on Figure 1, the block on the blockchain has two parts, the block head and block body. The block head has version value, hash code of previous block, timestamp, and block height. The block body records all transaction data for the block. The hash code is generated from a cryptographic algorithm that converts the original value into a hash value which creates more security when storing transaction data in the block body. Blockchain is believed to be able to secure the data that has been stored in it because each addition of a new block containing a collection of transaction data must be validated by a consensus algorithm. The peer-to-peer consensus algorithm makes the data in the blockchain difficult to modify by violators. [13] Consensus is about multiple entities/members/servers agreeing on the same value. Consensus refers to general agreement among members or groups of a community. Consensus in blockchain is basically a harmonization game decision among untrusted entities through messaging mechanisms to achieve reliability and fault tolerance in multi-agent systems.[14]

All data stored in the blockchain becomes a public ledger which cannot be deleted after approval by all members of the network.[15] This can also be called data immutability and is considered to be able to protect it from various kinds of data destruction. Additional security in the blockchain is the use of cryptography in the form of a public key when identifying network members. Meanwhile, verifying the authenticity of data uses a private key. In contrast to data stored in a central server which is vulnerable because administrators can compromise to make changes to data, blockchain uses a consensus agreement which means that the more members in the blockchain network, the more stringent verification process and the more difficult it is for data changes to be violated or no compromise. [16] Table 1 is a comparison between blockchain and database stored on a central server.

Table 1. Comparison between Blockchain and Database

Problem	Blockchain	Database in Central Server	Better Advantage
Building Trust	Can operate without a trusted party	Need a trusted center	Blockchain
Data Confidentiality	(by default) All nodes have data visibility	Restricted access to authorized people	Database
Durability / Fault Tolerance	Data is distributed among nodes	Data is stored in a central database	Blockchain
Performance	Takes time to reach consensus (e.g., 10 minutes for Bitcoin)	Immediate execution/payment	Database
Redundancy	(by default) Each participating node has the latest copy	Only the central party has a copy	Blockchain
Security	(by default) Using cryptographic steps	Using traditional access control	Blockchain

Transaction data can only be added by network members but can be accessed by all members which is considered to increase data transparency.[17] In this case, only authorized members can access the blockchain but all complete records of transactions can be seen by network members. Complete transaction reports come from transaction data that is added after passing the verification process of all members of the blockchain network to make it reliable.[18] Each block in the blockchain can contain a lot of data at once. For safety purpose, each member must have a digital signature. This is done in order for the blockchain to easily prove the identity of each member of the network, so authentication is only given to those possessing the digital signature.[19]

Efficiency is a key attribution in blockchain because transaction data can be shared digitally and instantly. Efficiency resulted from the use of smart contracts are automated digital agreements that can reduce transaction costs and increase security. Smart contracts are one of the ways to reduce conflict in a transaction and provide potential benefits compared to paper contracts that are easy to manipulate.[20]

4.3.   The Use of Blockchain Technology in Copyright Protection

The use of blockchain technology can be done as an implementation of copyright protection in the technology field. Copyright protection in the field of technology, especially copyrighted works in digital form, can synergize with Blockchain technology because it can store data in a distributed manner in a network by utilizing consensus algorithms and data encryption as described in the previous discussion. The concept of distribution on the blockchain can store copyrighted works as copies of transaction data that have been stored in each block owned by all members of the blockchain network. This will always ensure the availability of information regarding the publication of copyrighted works to the public and also the ownership security of the rights as the creator or copyright holder. If there is a change in data on one

computer, then all computers that have a copy of the data will verify whether the data is changed going through the correct procedure or not.

Looking at the legal rules contained in UUHC, blockchain technology is an innovation in copyright protection, especially Article 53 discussing that works using information technology-based data storage facilities with high technology must meet the requirements. Taking the rules in consideration, the use of bockchain technology then is very appropriate because blockchain has additional security by using cryptography in the form of a public key when identifying network members, while verifying the authenticity of data using a private key. In contrast, data stored in a central server is vulnerable because administrators can compromise to make data changes. Meanwhile, blockchain uses a consensus agreement which means that the more members in the blockchain network, the more stringent verification process and the more difficult it is for data change violations or no compromise. This, if associated with the implementation of UUHC blockchain, can qualify to protect digital copyrighted works uploaded via the internet using blockchain technology.

The use of blockchain technology is in line with the application of legal provisions to provide strong protection for copyrighted works produced by someone. It can be used by the public fairly and does not interfere with the rights of the owner of the work. The provisions contain aspects of the public interest in the prohibition of changing or hacking technology as a form of security against a work. Based on the discussion that has been described, some of the benefits of using blockchain technology are explained as follows:

a. Proof of creation

There is a wide variety of data that can be stored in a ledger, including text, photos, and videos. The existence of time markers makes it easier for creators to prove what and when their work was made in front of a court or when registering a copyright. Blockchain can provide solutions in copyright protection and digital copyright management.

b. Preventing Piracy/Plagiarism

Blockchain helps in preventing piracy/plagiarism and allows the storage of detailed information on the copyrighted work, including who the author was, and when the work was published.

c. Proof of use

Blockchain can also record the time when a copyrighted work was first published. Such data will be helpful in the case of a copyright dispute. In Indonesia, this technology can also assist the authorities in implementing the Copyright Act.

In line with the previous discussion, from a practical point of view, the use of blockchain technology in Indonesia has begun to be used for the benefit of the public sector by creative economy bodies as government representative institutions in the development of creative industries in Indonesia. Many creative industries produce products that have high economic value and are considered to have high potential in

advancing the country, but these products are vulnerable to abuse and violate in intellectual property area, especially in copyright.

5.   Conclusion

The use of blockchain technology as copyright law protection can be implemented in Indonesia and the technology can be used as an implementation of Article 53 UUHC which protects copyrighted works and can be used as proof of ownership of the work. There are various kinds of data that can be stored in a ledger, including text, photos, and videos that make it easier for creators to prove what and when their work was made before a court or when registering copyright works. Blockchain technology can provide solutions in copyright protection and management of digital copyright. It also prevents piracy/plagiarism because it allows storing detailed information on copyrighted works, including who the author was, and the time of publication of the copyrighted work. In addition, blockchain technology can also record the time when a copyrighted work was published for the first time. Such data will be helpful in case of a dispute in the case of a copyright dispute.

In protecting intellectual property rights in Indonesia, especially protecting copyright, the government must be able to implement modern technology so that the possibility of violations is minimised, and blockchain technology is essential as a safe data store so that copyright works that have been stored on the blockchain are guaranteed safe. This can also be used to publish copyrighted works according to the concept of copyright, namely that the copyright owner can be seen based on its first publication so that recognition or plagiarism of copyright can be prevented by using blockchain technology. The government must also create a data storage application using blockchain technology, especially for copyright registration certificates that DJKI has issued.

References

[1]   H. Munandar and S. S. Munandar, *Mengenal Hak Kekayaan Intelektual, Paten, Merk dan Seluk Beluknya*. Jakarta: Erlangga, 2009.

[2]   S. Margono, *Aspek Hukum Komersialisasi Aset Intelektual*. Bandung: Nuansa Aulia, 2010.

[3]   R. Jened, *Interface Hukum Kekayaan Intelektual dan Hukum Persaingan*. Jakarta: Rajawali Pers, 2013.

[4]   Simon, "Digital In 2016 Research," 2016.

[5]   Wipo, "Berne Convention For The Protection Of Literary And Artistic Works," *Geneve*, vol. 2, 1995.

[6]   Bambang Kesowo, *Pengantar Pemahaman Konsepsi Dasar Sekitar Hak Atas Kekayaan Intelektual*, I., vol. I. Jakarta: Sinar Grafika, 2021.

[7]   K. M. Simatupang, "Tinjauan Yuridis Perlindungan Hak Cipta Dalam Ranah Digital (Juridical Review of Copyright Protection in Digital Sector)," *J. Ilm. Kebijak. Huk.*, vol. 15, no. 1, pp. 70–72, 2021, doi: doi: http://dx.doi.org/10.30641/kebijakan.2021.V15.67-80.

[8]   M. Crosby, Nachiappan, P. Pattanayak, S. Verma, and V. Kalyanaraman, "BlockChain Technology: Beyond Bitcoin," *Appl. Innov. Rev.*, vol. 2, no. 4–5, pp. 222–228, 2016, doi: 10.15358/0935-0381-2015-4-5-222.

[9]   N. Friedman and J. Ormiston, "Blockchain as a sustainability-oriented innovation?: Opportunities for and resistance to Blockchain technology as a driver of sustainability in global food supply chains," *Technol. Forecast. Soc. Change*, vol. 175, no. December 2021, p. 121403, 2022, doi: 10.1016/j.techfore.2021.121403.

[10]   Y. Chen, H. Chen, Y. Zhang, M. Han, M. Siddula, and Z. Cai, "A Survey on Blockchain Systems: Attacks, Defenses, and Privacy Preservation," *High-Confidence Comput.*, vol. 2, no. 2, p. 100048, 2021, doi: 10.1016/j.hcc.2021.100048.

[11]   W. Villegas-Ch, X. Palacios-Pacheco, and M. Román-Cañizares, "Integration of IoT and blockchain to in the processes of a university campus," *Sustain.*, vol. 12, no. 12, pp. 1–21, 2020, doi: 10.3390/su12124970.

[12]   Tomicah Tillemann, A. Price, G. Tillemann-Dick, and A. Knigh, "The Blueprint for Blockchain and Social Innovation: Case Studies," *New Am.*, no. January, 2019.

[13]   M. Wang, Y. Wu, B. Chen, and M. Evans, "Blockchain and supply chain management: A new paradigm for supply chain integration and collaboration," *Oper. Supply Chain Manag.*, vol. 14, no. 1, pp. 111–122, 2021, doi: 10.31387/oscm0440290.

[14]   B. Shrimali and H. B. Patel, "Blockchain state-of-the-art: architecture, use cases, consensus, challenges and opportunities," *J. King Saud Univ. - Comput. Inf. Sci.*, no. xxxx, 2021, doi: 10.1016/j.jksuci.2021.08.005.

[15]   J. Yli-Huumo, D. Ko, S. Choi, S. Park, and K. Smolander, "Where is current research on Blockchain technology? - A systematic review," *PLoS One*, vol. 11, no. 10, pp. 1–27, 2016, doi: 10.1371/journal.pone.0163477.

[16]   M. J. M. Chowdhury, A. Colman, M. A. Kabir, J. Han, and P. Sarda, "Blockchain Versus Database: A Critical Analysis," *Proc. - 17th IEEE Int. Conf. Trust. Secur. Priv. Comput. Commun. 12th IEEE Int. Conf. Big Data Sci. Eng. Trust. 2018*, no. December, pp. 1348–1353, 2018, doi: 10.1109/TrustCom/BigDataSE.2018.00186.

[17]   R. R. M. R. Vatrapu, P. K. Ray, G. Sengupta, and S. Halder, "Blockchain for Social Business: Principles and Applications," *IEEE Eng. Manag. Rev.*, vol. 46, no. 4, 2018.

[18]   J. S. Kim and N. Shin, "The impact of blockchain technology application on supply chain partnership and performance," *Sustain.*, vol. 11, no. 21, 2019, doi: 10.3390/su11216181.

[19]   D. Galen *et al.*, *Blockchain for Social Impact*. Stanford: Stanford University, 2018.

[20]   M. Alharby, A. Aldweesh, and A. van Moorsel, "Blockchain-based Smart Contracts: A Systematic Mapping Study of Academic Research," *2018 Int. Conf. Cloud Comput. Big Data Blockchain*, pp. 1–6, 2019.