A Design of Copyright Management for Licensing of Author's Property Right of Digital Copyrighted Work on Metaverse Platform

Sung Il Jang
Lsware Inc.
Republic of Korea
sungil@lsware.com

Yong Joon Joe
Lsware Inc.
Republic of Korea
eugene@lsware.com

Kyung Yeob Park
Lsware Inc.
Republic of Korea
carl@lsware.com

Dong Myung Shin
Lsware Inc.
Republic of Korea
roland@lsware.com

ABSTRACT

Recently, with the advent of Non-Fungible Token (NFT), the need to protect the copyright of digital copyrighted works is increased. In this paper, we refine the structure of NFT that proves the ownership of digital copyrighted works and propose a method for licensing of author's property right of digital copyrighted work.

KEYWORDS

Copyright-Management, Licensing, NFT, Metaverse-Platform, Digital-Copyrighted-Work

1 INTRODUCTION

Recently, digital copyrighted works have been looking for various uses due to the emergence of NFTs that can prove ownership. Among them, a representative platform is the metaverse platform. The metaverse platform is a digital space optimized to use digital works in the form of NFT. Many projects are trying to converge NFT and metaverse. Typical examples are The Sandbox and DeFi Land [1,2]. Currently, many metaverse projects are implemented based on games. However, Avatar-based platforms like ZEPETO are also introducing NFT [3].

NFT should be protected for copyright as digital copyrighted works in these metaverse platforms. However, it isn't easy to appropriately manage the copyright on the metaverse platform only with NFT. When many works must be used simultaneously, such as virtual performances, it becomes very complicated to process copyright. In this paper, we propose a copyright management method for licensing copyrights of digital copyrighted works on a metaverse platform.

2 BACKGROUNDS

2.1 Copyright and License

Copyright is the original author's right to works such as art and video. Copyright is divided into the author's moral right and the author's property right. Since the author's moral right is not transferable to others, we target the author's property right, which can be transferred or licensed to others. The types of author's property rights are shown in Table 1.

Table 1: Type of Author's Property Rights in Korea

Name	Related Law
Reproduction Right	COPYRIGHT ACT, Article 16
Performing Right	COPYRIGHT ACT, Article 17
Public Transmission Right	COPYRIGHT ACT, Article 18
Public Exhibition Right	COPYRIGHT ACT, Article 19
Right to Distribute	COPYRIGHT ACT, Article 20
Rental right	COPYRIGHT ACT, Article 21
Adaptation right	COPYRIGHT ACT, Article 22

The license is for the author to allow others to use the copyrighted work, and there are exclusive licenses and non-exclusive licenses. An exclusive license is deemed to be in violation of the contract if the author allows someone other than the exclusive licensee to use the work. A non-exclusive license is a non-beta contract.

2.2 NFT

NFT is a type of cryptocurrency derived from Ethereum [4]. NFT was proposed by Ethereum Improvement Proposals (EIP)-721, and EIP-1155, which combines EIP-20 and EIP-721, is emerging as a new standard [5,6,7]. The difference between EIP-721 and ERC-20 is the uniqueness of tokens issued by Smart Contract. EIP-20 serves as a currency as there is no difference between tokens. EIP-721 has

a unique value for each token, so that each token has an irreplaceable characteristic. Therefore, EIP-721 allows the URI of the image to be inserted into a unique value to prove ownership of the work.

3 Copyright Management of Digital Copyrighted Work

The required metadata for EIP-721 is name, description, and image. In this paper, for copyright management, content hash, the name of the original author, and the URI of the original author are added.

We designed a management unit that deals with ownership, copyright, and license for copyright management. Ownership is managed using the NFT, and copyright and license are handled by each copyright token and license token.

Table 2: Components of NFT

Component	Item
Content info.	Content name
	Content Description
	Content URI
	Content Hash
Original author info.	Original author name
	Original author URI

3.1 Copyright Token

Copyright tokens must specify the target NFT ID as mandatory for integration with NFT. And licensor is the original author or the person who takes over the author's rights. In addition, if transferred, the copyright share ratio should be specified because it may be owned by several people. Finally, we need the type of author's property right with which the copyright token deals. The type of author's property right is the seven species mentioned above.

Table 3: Components of Copyright Token

Component	Item
NFT integration info.	Target NFT ID
Licensor info.	Licensor name
	Licensor URI
	Copyright share ratio
Copyright info.	Type of author's property right

3.2 License Token

License Token must specify the target NFT ID and copyright token ID for integration with NFT and Copyright token. The license token has the same licensor as the copyright token. In addition, the license agreement also requires the user to be specified, so licensee information is required. The licensing agreement information represents the type of license, period of use, terms of use, and exclusive status determined by the agreement.

Table 4: Components of License Token

Component	Item
NFT integration info.	Target NFT ID
	Target copyright token ID
Licensor info.	Licensor name
	Licensor URI
Licensee info.	Licensee name
	Licensee URI
Licensing agreement info.	Type of license
	Period of use
	Terms of use
	Exclusive status

4 CONCLUSIONS

In this paper, we designed NFT, copyright token, and license token for copyright management on the metaverse platform. Each token is a unit that manages ownership, copyright, and licenses. We devised an architecture in which copyrights and licenses are also issued in the token form to ensure the author's property right of the original author within the metaverse platform and to activate copyright transactions.

Future studies can address the considerations when implementing each token. In particular, license tokens deal with information that should not be disclosed in the public blockchain, so it may be possible to propose a solution to this.

ACKNOWLEDGMENTS

This research was supported by Culture, Sports and Tourism R&D Program through the Korea Creative Content Agency grant funded by the Ministry of Culture, Sports and Tourism in 2022. (Project Name: Development of blockchain-based copyright protection and utilization technology to support large-scale virtual performance platforms, Project Number: R2022020057, Contribution Rate: 100%)

REFERENCES

[1] Animoca Brands. (n.d.). THE SANDBOX. https://www.sandbox.game/en/
[2] DeFi Land Foundation. (n.d.). DEFI LAND. https://defiland.app/
[3] LINE Blockchain. (2021, November 29). LINE Blockchain Launches ZEPETO NFT Collection. Medium. https://medium.com/lineblockchain/pr-line-blockchain-launches-zepeto-nft-collection-147e338e10ba
[4] Wang, Q., Li, R., Wang, Q., & Chen, S. (2021). Non-fungible token (NFT): Overview, evaluation, opportunities and challenges. arXiv preprint arXiv:2105.07447.
[5] Vogelsteller, F., Buterin, V. (2015, November 19). EIP-20: Token Standard. Ethereum Improvement Proposals. https://eips.ethereum.org/E IPS/eip-20
[6] Entriken, W., Shirley, D., Evans, J., & Sachs, N. (2018, January 24). EIP-721: Non-Fungible Token Standard. Ethereum Improvement Proposals. https://eips.ethereum.org/EIPS/eip-721
[7] Radomski, W., Cooke, A., Castonguay, P., Therien, J., Binet, E., & Sandford, R. (2018, June 17). EIP- 1155: Multi Token Standard. Ethereum Improvement Proposals. https://eips.ethereum.org/EIPS/eip-1155