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Title: Creative digital assets as NFTs: A new means for giving artists their power back?

Abstract:

NFTs representing creative digital works have recently seen a significant increase in popularity, arguably due to making the ownership of digital scarce assets possible, being securely stored and authenticated on blockchains. Given that scarcity and verifiability were previously almost unattainable in the digital world, NFTs and their programmable nature are viewed as a unique opportunity to copyright owners, for safeguarding their exclusive rights as well as for exerting greater control over use of their works.

Introduction:

This article examines the interrelation between copyright law and the newly emerged non-fungible tokens (hereinafter 'NFTs'), which are stored in blockchain systems. NFTs have recently become the centre of attention, due to representing an abundance of digital creative assets and subsequently, becoming sold for unprecedented amounts. Digital artwork[1], music[2] and gaming collectibles[3] are just a few examples of copyright-protected assets, whose NFT tokens' sale has generated hundreds of the Ethereum cryptocurrency (ETH) to their owners, equivalent to hundreds of thousands in conventional currencies. This is ground-breaking, when thinking that the first NFT sale of that sort, 'Nyan Cat' by Chris Torres, concerned a digital cartoon animation featuring a cat. 'Nyan Cat' was sold for an astounding amount of 300 ETH, whose value at the time of the sale is estimated at $590,000 USD[4].

The great revenue that can be generated from NFT sales has appealed to the creative industries, as artists have realised that they can get a profit from monetising their digital works as tokens. Although one would expect that use of an original digital work would automatically mean that its creator would get rewarded, this is far from the reality. What truly happens, ever since the emergence of Web 2.0, which refers to the introduction of peer-to-peer file sharing structures over the Internet in the early 2000's, is the rampant copying of copyright-protected digital works and their unauthorised dissemination among online users. In the blockchain era that we are currently commencing, NFTs present new ways for artists to enforce their copyrights.

But, before proceeding to a discussion as to how exactly NFTs can be of benefit to copyright owners, Part I of this article will provide an overview of non-fungible tokens, as well as of their underlying blockchain technology. This is necessary for getting a clear

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[1] See footnote 14, on the sale of Beeple's tokenised digital artwork

[2] For example, the music band Kings of Leon selling their digital album, together with a vinyl record, as an NFT, <https://opensea.io/assets/0x557430421f8f3ed0a92aca211f1c05ad7b606288/0>, [Accessed 25 April 2021]

[3] For example, the digital collectibles 'NBA TopShots', <https://nbatopshot.com/>, [Accessed 25 April 2021]

[4] Referring to Chris Torres' 'Nyan Cat', <https://en.wikipedia.org/wiki/Nyan_Cat#/media/File:Nyan_cat_250px_frame.PNG>, [Accessed 25 April 2021]

understanding as to what exactly is being sold, when talking about the sale of NFTs of digital creative works. The subject-matter of the sale cannot simply be a copy of a digital file, as this could be easily acquired online in a 'copy, paste and share' manner. Therefore, it is highly unlikely that anyone would be interested in investing substantial amounts in purchasing something that they can potentially get for free, although possibly illegitimately. Through this analysis, the reason why NFTs are significantly high valued will become clear. Then, Part II is going to discuss ways in which NFTs could be beneficial to copyright holders. This may become possible, by enabling creators to exert greater control over use of their digital works, while ensuring that they receive remuneration throughout the duration of their copyrights.

Part I:

i. Blockchain Technology

The underlying technology that facilitates the creation, else called 'minting', the operation, as well as potential sales of NFTs is blockchain technology. A brief overview of this technology is essential, for better understanding NFTs' nature. Blockchains are decentralised peer-to-peer systems, specifically designed for storing data in an encrypted form. Once data become logged into the blockchain record, else called 'ledger', they form virtual time-stamped 'blocks', which cannot be reversed or altered. 'Blocks' are cryptographically linked with their preceding 'blocks' and hence, a chronologically-ordered and immutable 'chain' of records is formed. Importantly, this chain is registered on a single ledger, which is shared across a peer-to-peer network of multiple participating computers, known as 'nodes'. The blockchain's protocol has a consensus mechanism in place, which requires 'nodes' presented with new entries of data, to verify them or else, upon inspection, to agree that they are consistent with pre-existing data stored in the 'ledger'. In this way, blockchain entries of data are verifiable and trust is achieved, without the involvement of a centralised authority to overlook blockchain transactions[5].

ii. Non-fungible Tokens (NFTs)

An NFT is a token of a non-fungible nature, and the moment nodes verify it and allow it to come into existence, or become 'minted', it gets permanently stored into a 'block' and hence, becomes part of the blockchain ledger. As tokens, NFTs stand for units of value, which are digitally scarce, and represent physical or digital assets. In practice, the tokens do not typically contain a copy of the asset itself, but rather they contain metadata related to it. For instance, a token representing a digital artwork typically contains a description of the work, transactional data and a URL link, where the actual digital file is stored off-chain on a different database.

The second element of NFTs is that they are non-fungible, as opposed to cryptocurrencies, such as Ethereum or Bitcoin, which are fungible tokens. Every single token of the latter, for example every ETH fungible token, is exchangeable for another, as they have the exact same value. In contrast, when having non-fungible tokens in mind, every single NFT token is unique and hence, it cannot become divided into smaller fragments. As such, it has a different value from any other token and therefore, it is non-exchangeable. Most commonly,

[5] Although blockchain's operation is certainly worthy of a more in-depth discussion, it is not going to be the focus of this article.

an NFT is minted on the public Ethereum blockchain, in accordance with the ECR-721 technical standard[6] that it has developed, which makes use of smart contracts, or else computer software containing pre-programmed and self-executing instructions upon the fulfilment of certain conditions. Under the ECR-721, a smart contract's role is to transpose unique characteristics into NFTs, making them scarce, while setting out a minimum interface for their management, ownership and trading.

Focusing on the NFT trading point, as every other asset, an NFT representing a creative work can be bought or sold on specialist NFT platforms/ marketplaces, such as OpenSea[7] or Nifty Gateway[8], usually in exchange for cryptocurrencies. NFT transactions are also permanently recorded on the same blockchain ledger that the minting took place and hence, ownership of the token is visible from all interested parties. What happens in practice during a sale, is that a smart contract is triggered on the blockchain and enables the automated execution of certain acts, for instance, a certain amount of ETH to be paid to the seller.

iii. NFTs as Valuable Assets

Although the technological framework of NFTs has been explored in detail, one question remains: What is it that makes NFTs of creative digital works so extremely valuable, to the point that considerable investments are made to obtain them?

To put it simply, nowadays, there is a particular ease at which digital works can become copied, pasted and disseminated online without the copyright owner's consent, moments after legitimately being uploaded online through an intermediary. The fact that multiple identical copies to a digital work can be shared among users, automatically makes the original work diminish in value, as, effectively, its uniqueness gets lost. So, how come that NFTs representing digital works that are often subjected to uncontrollable copying, are so sought after?

The answer is simple and can be found by revisiting what has just been explained about the nature of NFTs. NFTs are scarce versions of the digital work in question, whose metadata indicate the work's provenance and these cannot be tampered with, as they are securely stored in a blockchain record. Importantly, an NFT is not a copy of the digital work. Instead, it is a unique token that represents the work, which is inextricably tied to its creator. Therefore, it can be thought of as being analogous to an authenticity certificate that comes with the purchase of a rare painting. And although more than one unique non-fungible tokens can be generated for a specific creative work, they are still limited in number, as opposed to the countless exact copies that can be made in relation to the work.

But, even if we assume that the mass dissemination of copies of a digital work can make it decrease in value, its NFT's value would not be decreased, as it serves a different concept: the concept that you own a scarce version of a digital creative work. As such, NFTs are viewed as valuable commodities, whose value can and as will be discussed later, often increases over time. The possibility of owning a scarce digital version of a work, or a 'collectible', was previously reserved in relation to physical works, but this is not the case anymore. Hence, an individual who makes an investment into purchasing an NFT of a creative digital work, can essentially be parallelised with a collector of a signed, limited-edition copy

[6] Ethereum Request for Comments 721 Standard (ECR-721), <http://erc721.org/>, [Accessed 27 April 2021]
[7] OpenSea, <https://opensea.io/>, [Accessed 27 April 2021]
[8] Nifty Gateway, <https://niftygateway.com/>, [Accessed 27 April 2021]

of a book. Even though copies of the book can be made, the limited-edition copy's value differs from and arguably supersedes the value of any other copy.

Part II:

The creative industries are copyright-intensive, mainly generating literary and artistic works. In simple terms, the whole idea behind copyright law is to incentivise artists into creating new works, that will be circulated into society for the public to enjoy and for the advancement of the field in question. In exchange, copyright holders are allowed to enjoy some control over use of their works and receive a monetary reward whenever a third party wishes to use them. This is achieved, by vesting creators a number of exclusive usage rights, over the copying, distribution, adaptation, public performance or display, or the public communication of their works[9].

However, artists are experiencing difficulty in fully exercising their rights, mainly due to the online content 'copying-and-sharing' culture that has been developed among online users, since the advent of Web 2.0. What happens with physical artworks, is that they tend to be unique and any replication attempt of the original can often become easily detected. By taking the replication of an oil painting as an example, it is highly likely that the replica will have discernible differences compared to the original, for instance, depending on the painting technique followed, which, in some cases, may actually simply be the 2D-printing of an image depicting the work, or the quality of the materials used.

In contrast, copyright works in digital form can become identically copied instantaneously and are, therefore, often replicated beyond the control of their creators. Even though certain mechanisms are in place for ensuring that use of a digital work is permissible, most commonly through licensing agreements or other digital rights management technologies, these can often become circumvented. As such, the uncontrollable unauthorised dissemination of copyright-protected digital works, mainly affects creators, who are unable to exercise their exclusive rights and claim a financial reward over use of their creations.

More than this, by taking a closer look at the reality of how the creative industries operate, it is noticeable that creators of original digital works cannot fully enjoy the economic benefits arising from their exclusive rights. This is the case, as even when artists secure deals for their digital artwork or their music, the copyright intermediaries that host and make the digital content available to users, retain the biggest part of profits, while the copyright owners only receive a fraction of the revenues. At the same time, intermediaries retain a high degree of control over the exploitation of the creative works, leaving copyright owners in an arguably powerless position.

The issue of artists' lack of control over use of their digital works and in particular, the power and profit imbalance between copyright owners and intermediaries, could arguably be overcome through the tokenisation of digital creative works and their distribution directly to end-users, with the assistance of blockchain technology.

[9] Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the Harmonisation of Certain Aspects of Copyright and Related Rights in the Information Society (InfoSoc Directive), OJ L 167, 22 June 2001, Art. 2-4

i. NFTs Control

To begin with, as previously explained, an NFT representing a digital copyright work contains metadata, that describe what the digital asset is as well as other kind of information that make the NFT unique, including the identity of the copyright owner. This record is unalterable and is permanently stored in the blockchain. This ultimately means that NFTs automatically prove ownership of the creative assets in question and the information cannot be tampered with, due to the nature of blockchain software.

An example of the difference between the traditional creative industries' framework and the NFT/ blockchain alternative in controlling copyright-protected digital assets, can be drawn from the gaming sector. CryptoKitties, launched in 2017, makes one of the first and most popular decentralised blockchain video game applications, where users can create digital cat collectibles that are represented in non-fungible token form and are securely stored in the Ethereum blockchain[10]. What this means, in practice, is that the users who create collectibles are the copyright owners of the original digital works, as well as their NFT owners. As such, this gives them the right to sell, transfer or otherwise control the digital assets via smart contract code. In contrast, when considering other digital video games, such as Minecraft[11], users are typically restricted by licensing agreements, under which any user-generated content is to be used for non-commercial purposes only. Therefore, it is evident that creators of digital content, who are owners of NFTs, are in a much stronger position than ever before, in relation to controlling their unique creations.

Another important point that should be highlighted, given that part of the NFT hype of creative works is about collecting and re-selling them for a profit, is that the copyright owner of the work that an NFT represents, retains the copyright over the work, even if its tokenised version changes hands. Therefore, a transfer of the NFT would not mean that its new owner holds any of the rights that are the exclusive rights of the copyright owner, unless expressly stated in the smart contract responsible for facilitating the transfer. Nonetheless, apart from specific uses that fall within the 'fair use' copyright exceptions, it is often the case that the new NFT owner is granted certain additional limited rights in relation to use of the digital work's token, which are pre-decided by the copyright owner. Therefore, it is evident that an NFT acts as a powerful means for allowing the copyright owner to control the use of their work over an NFT resale.

Nevertheless, it should be noted that the existence of an NFT does not exclude the possibility, that the piece of digital work it represents will become replicated beyond the control of the copyright owner. However, the NFT itself is scarce, meaning that those who claim ownership over it, still retain control over it, due to the very secure blockchain framework that surrounds it. Unless the NFT owner decides to resell it, the NFT could only become compromised in the unlikely event of an organised hacking attack of the whole highly encrypted blockchain system. But, this would require the hackers to control the majority of nodes, which can often be thousands in public blockchains. Hence, they would need to demonstrate highly sophisticated hacking skills, extreme computational power, as well as bear the equally high associated costs. Alternatively, infringers could target hacking the digital 'wallet' of the NFT owner, or else the part of the 'block' in which the NFT is stored. The only way to access the wallet, is by having access to a pair of cryptographic keys. One of the keys is public and visible to network participants and in essence, acts as the address of where the

[10] CryptoKitties, 'Technical Details', <https://www.cryptokitties.co/technical-details>, [Accessed 22 April 2021]

[11] MOJANG, 'Minecraft End-User License Agreement', <https://perma.cc/N3J5-UKD8>, [Accessed 25 April 2021]

asset is stored, whereas the second key is private and only known to the NFT owner and acts as an email password. In theory, acquisition of the private key could be achieved, for instance, by hacking the NFT owner's computer, where this 'password' is saved. Although it could not amount to hacking the blockchain system, it could, nevertheless, unlock the 'wallet' and its valuable encrypted content. But NFT owners are well aware of this danger and make sure to keep their cryptographic keys stored safely, turning the event of a potential leak unlikely. Even though NFTs cannot provide a solution for the issue of unauthorised use of the actual digital works, the fact that they can at least ensure that the tokenised limited versions of the works remain fully protected, effectively means that copyright owners can exert control over them for as long as the copyright lasts.

ii. NFTs Power & Profit

This leads us to the next point of discussion, in relation to the issue of too much power currently being vested in intermediary distributors of creative works. Blockchain technology and tokenisation might be just the right alternative solution to the European Artist's Resale Right (ARR)[12], as a means for providing revenue to copyright owners. Although the ARR was intended to provide a downstream payment to creators for every resale of their original works of art, its applicability is reserved only in cases of reselling physical objects[13]. Therefore, the resale of NFTs linked with digital creative works falls outside the scope of this regime.

The whole idea upon which this resale right NFT application is based, is that a blockchain ecosystem enables creators to distribute their works directly to end-users by means of smart contract. By tokenising their digital works as NFTs, which ultimately means that they would be automatically verifiable as authentic and as their own, artists could additionally be able to be paid commission each time their work becomes 'used'. In practice, the NFT can contain smart contract code with a resale royalty embedded in it, whose value is determined by the NFT hosting platform, where the NFT becomes minted. In this scenario, the smart contract would automatically execute pre-programmed instructions to distribute those royalties and make automatic micro-payments back to the copyright owner, whenever a transfer of the token, or else a resale of the work's NFT, is performed. And this could be achieved without the involvement of any intermediaries, such as lawyers, as there is transparency of any resales logged in the ledger to trigger the smart contracts. In other words, the blockchain itself provides certainty that copyright owners will receive remuneration.

Another striking difference with the current intermediary-run framework, is that the payments could be performed even when the copyright owner does not retain control over the copyright work anymore, meaning that the smart contract could be programmed to continue making downstream payments for the whole duration of the copyright. For instance, a crypto-artist named Beeple, initially auctioned the NFT of a digital piece of art, named 'Everydays: The First 5000 Days'[14] to a collector for $69,3 billion USD. Over the course of six months, its resale generated a nearly 1,000% profit compared to its initial purchase price. As such, in an interview, Beeple admitted that he has been able to net more profit from the resale of his artwork than from the original sale, through the 10% resale royalty scheme set forth by

[12] Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, OJ L 272, 13.10.2001
[13] Ibid, Recital 2
[14] Beeple, 'Everydays: The First 5000 Days', <https://onlineonly.christies.com/s/beeple-first-5000-days/lots/2020>, [Accessed 26 April 2021]

Nifty Gateway, the NFT platform where he traded his artwork [15]. In essence, NFTs and a blockchain infrastructure, together with the assistance of smart contracts, could establish a contractually enforced artists' resale right in relation to digital copyright works, something that has not yet been adopted by the European Union's legislature.

Conclusion:

NFTs present an opportunity for strengthening the position of copyright owners in relation to managing their creative works, in new ways that could not be possible in the pre-blockchain era. With the assistance of smart contracts, artists are able to retain control over the use and distribution of their tokenised digital works, while being guaranteed remuneration whenever their NFTs become resold. Given that creators of digital works do not qualify for the statutory ARR, the NFT blockchain-based framework is a truly promising alternative, as a means to enjoy financial rewards for the use of their works, throughout their copyright's lifecycle.

[15] G. Kay, B. Chang, 'A digital artist known for his satirical work is breaking sales records, making over $10 million on 2 crypto-art pieces', *Insider* (Mar. 4, 2021), <https://www.businessinsider.com/art-nft-beeple-blockchain-pieces-sell-for-millions-2021-3?r=US&IR=T>, [Accessed 26 April 2021]