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The Treachery of Images: Non-fungible tokens and copyright

Dr Andres Guadamuz*

1. Introduction

In April 2021, a sketch by celebrated neo-expressionist artist Jean-Michel Basquiat drew considerable press coverage due to a potential copyright dispute. Basquiat, who passed away in 1988, is well known for his use of thematic juxtapositions,¹ but is also remembered as an artist who died in his prime in tragic circumstances. His artwork is critically acclaimed, and it often sells for considerable amounts of money; a painting called *Untitled* sold for over \$110 million USD in 2017, making it one of the most expensive art sales in art history.²

Daystorm is an art collective that owned the Basquiat mixed media work called *Free Comb with Pagoda*,³ and they announced that they would be making a non-fungible token (NFT) of the work. NFTs are the latest hype in the art world, which bring together smart contracts and blockchain technology, so this would not have generated a lot of interest if it were not for the fact that their announcement included the statement that the NFT would transfer not only the ownership of the digital file, but the new owner would be given the choice to destroy the original work if they so desired.

This drew the ire of art enthusiasts and prompted several legal questions as to whether this was possible under copyright law.⁴ There is something decidedly distasteful in the destruction of a physical work of an important 20th Century African American artist, but also there was the fact that this was done to generate interest and scarcity in a ploy to boost the price of the auction. The outrage reached the art licensing agency that manages Basquiat's artwork on behalf of his estate, and they declared that Daystorm

* Reader in Intellectual Property Law, University of Sussex. This article started life as a series of blog posts at the Technollama Blog. See: <https://www.technollama.co.uk/category/nfts>. All links are working as of 3/10/2021.

The first draft of this article has been minted as an NFT: see:

<https://rarible.com/token/0x60f80121c31a0d46b5279700f9df786054aa5ee5:1183840?tab=details>.

¹ Saggese JM, *Reading Basquiat: Exploring Ambivalence in American Art* (University of California Press 2014), p.32.

² Villa A, 'The Most Expensive Jean-Michel Basquiat Works Ever Sold at Auction', Art News (March 8, 2021) <https://www.artnews.com/list/art-news/artists/jean-michel-basquiat-most-expensive-works-1234585981/>.

³ <http://www.artnet.com/artists/jean-michel-basquiat/free-comb-with-pagoda-BTfRBn9W3bOUAn0GwRJZXg2>.

⁴ O'Donnell N, 'No, you probably can't sell your Basquiat as an NFT', Apollo Magazine (12 May 2021), <https://www.apollo-magazine.com/basquiat-nft-intellectual-property-copyright/>.

only owned the physical copy of the work but did not possess any of the accompanying copyrights.⁵

The artwork was immediately removed from sale,⁶ but the Basquiat sketch is just the latest example in a growing number of works that are prompting legal questions regarding the interaction between copyright and non-fungible tokens. Recently, an art collective purchased a copy of a work by Banksy, burnt it, and turned it into an NFT.⁷ A viral video of a baby biting his brother's finger, popularly known as "Charlie Bit Me" was sold as an NFT for \$500k USD, with the video being taken offline after the sale.⁸

What exactly is an NFT? Can one use it to transfer copyright ownership on a work, or does it work like a licence? What happens if one creates an NFT of a work without permission? Is it infringement?

This article will tackle these questions from a UK perspective, specifically looking at cases from England and Wales, and Scotland, while also covering a few relevant CJEU decisions. This is a relatively recent technology, which will require a lengthier technical explanation to analyse the legal issues discussed. In some instances, the public perception will be dealt with as well, as it has become evident that there is considerable misunderstanding not only about what an NFT really is, but about the ownership and copyright issues that surround the technology. While NFTs are not entirely related to copyright, and in some way they're trying to bypass legal transactions in favour of technical solutions, this paper will concentrate on the copyright questions, but it will also tackle some of the emerging issues about the technology.

A quick note about balance. This work will take a generally neutral approach to the study of NFTs, but this is a subject that is not devoid of controversy. There have been concerns raised about the viability of this model from various perspectives, but it is not the remit of the work to tackle these, and the approach will be to view non-fungible tokens at face value. The concerns range from the environmental cost of running blockchain technology,⁹ to the use of tokens for money laundering,¹⁰ to the existence of often crippling transaction fees that could make it difficult for artists to profit from their work.¹¹ It is important to highlight these here, although they will not be the subject of further analysis.

⁵ Shaw A, 'Basquiat NFT withdrawn from auction after artist's estate intervenes', The Art Newspaper (28 April 2021), <https://www.theartnewspaper.com/news/basquiat-nft-withdrawn-from-auction-after-artist-s-estate-intervenes>.

⁶ *ibid.*

⁷ Criddle C, 'Banksy art burned, destroyed and sold as token in 'money-making stunt'', BBC News (March 9, 2021), <https://www.bbc.co.uk/news/technology-56335948>.

⁸ Kleinman Z, 'Charlie Bit My Finger video to be taken off YouTube after selling for £500,000', BBC News (May 24, 2021), <https://www.bbc.co.uk/news/newsbeat-57227290>.

⁹ Blockchain mining uses proof of work technology that is energy intensive. At the time of writing, the Bitcoin network alone required more energy than the entire country of Finland. See: <https://cbeci.org/cbeci/comparisons>.

¹⁰ Loizos C, 'As more artists and musicians turn their attention to NFTs, so, likely, do money launderers', TechCrunch (March 25, 2021), https://techcrunch.com/2021/03/24/nft_users/.

¹¹ Fadilpašić S, 'Ethereum Burning Thousands of USD a Minute, While Miners Face the Change', Cryptonews (August 06, 2021), <https://cryptonews.com/news/ethereum-burning-thousands-of-usd-a-minute-while-miners-face-11340.htm>.

2. Understanding NFTs

Any discussion of NFTs must contend with the considerable amount of hype and hyperbole which accompanies the subject of cryptocurrencies, smart contracts, and blockchains (also known as distributed ledger technologies, DLTs). It is not the objective of this work to discuss these subjects in detail, by now there is a very good understanding in the literature of what is a blockchain,¹² and how it can be used in different areas related to copyright specifically.¹³ However, as it will become clear later, non-fungible tokens require a detailed technical explanation because the legal analysis may depend entirely on what the technology is doing. There are also different types of NFT, so we need to have a clear explanation of what the technology is, and how it works.

So what is an NFT? To understand them, we first need to discuss tokens and distributed ledger technologies, albeit briefly, as it will be assumed that this is a well-trodden topic. A blockchain is a cryptographic distributed, and decentralised ledger which keeps permanent and public record of transactions by appending information in an immutable record.¹⁴ The basic technology supporting DLTs is non-proprietary, which means that anyone can create and run their own network, or they can join an existing one. Therefore, there are various blockchains out there supported by a network of computers that are used to record the transactions. We will be mostly talking about the Ethereum blockchain as it is the most popular when it comes to NFTs, but there are many others.¹⁵

One of the most heralded uses of distributed ledger technologies is that of the tokenization of assets, where a token is a programmable digital unit of value that is recorded on the blockchain. There are various types of tokens,¹⁶ and they can represent anything: commodities, loyalty points, shares, coins, etc. At the most basic level, a token in the DLT sense is a piece of code which acts as an encryptable representation of the other object, and this code can be unique.

The most popular token standard is found in the Ethereum infrastructure which uses its own computer language called Solidity, with the deployment of tokens using a specific type of standard known as ERC20,¹⁷ this sets out the rules for fungible tokens. Fungible goods are by definition exchangeable, it does not matter what specific item you are selling or buying. Commodities tend to be fungible, silver, gold, oil, grains. Conversely, non-fungible goods are those which are unique, so a specific silver necklace, or a golden

¹² Amongst the works explaining blockchain and smart contracts, see: Durovic M and Janssen A, 'The Formation of Blockchain-Based Smart Contracts in the Light of Contract Law' (2018) 26 *European Review of Private Law* 753; Gerard D, *Attack of the 50 Foot Blockchain: Bitcoin, Blockchain, Ethereum & Smart Contracts* (Self 2017); Guadamuz A and Marsden C, 'Blockchains and Bitcoin: Regulatory Responses to Cryptocurrencies' (2015) 20:12 *First Monday* <https://doi.org/10.5210/fm.v20i12.6198>; De Filippi P and Wright A, *Blockchain and the Law: The Rule of Code* (Harvard University Press 2018).

¹³ Bodó B, Gervais D, and Quintais JP, 'Blockchain and Smart Contracts: The Missing Link in Copyright Licensing?' (2018) 26 *International Journal of Law and Information Technology* 311.

¹⁴ Werbach K, *The Blockchain and the New Architecture of Trust* (MIT Press 2018), at 11.

¹⁵ Zheng Z and others, 'An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends', 2017 IEEE International Congress on Big Data (BigData Congress) (2017)

¹⁶ Lee JY, 'A Decentralized Token Economy: How Blockchain and Cryptocurrency Can Revolutionize Business' (2019) 62 *Business Horizons* 773.

¹⁷ <https://ethereum.org/en/developers/docs/standards/tokens/erc-20/>.

statuette, or a painting. Non-fungible goods use a different token standard, known as ERC-721.¹⁸ There are many other standards that could be relevant to copyright, such as a token standard for ownership transfer (ERC-173),¹⁹ but for the most part we will be discussing tokens created with ERC-721.

Any digital work is capable of being turned into a non-fungible token, even physical goods that can be represented in some digital form, such as a photo, a video, or a scan. The first use of the NFT standard in the Ethereum environment is a set of pixelated images of characters called Cryptopunks,²⁰ which was released in June 2017. A similar type of non-fungible token was released in October 2017, and it involved tokens representing a collectible cat game called CryptoKitties.²¹ In the intervening time, other types of works have been turned into an NFT, including memes²², music albums,²³ viral videos,²⁴ sport highlights,²⁵ tweets,²⁶ and digital art.²⁷

As it will be expanded later, there are various types of NFTs, but the most common is a metadata file which contains information that has been encoded with a digital version of the work that is being tokenised. It's important to explain the tokenisation step in detail, as it is one of the most misunderstood parts of the NFT phenomenon, and this will be vital for the legal analysis in later sections.

To illustrate the point, we will make a non-fungible token (known as “minting”) of this image (Image 1).

¹⁸ <https://eips.ethereum.org/EIPS/eip-721>.

¹⁹ <https://eips.ethereum.org/EIPS/eip-173>.

²⁰ <https://www.larvalabs.com/cryptopunks>.

²¹ <https://www.cryptokitties.co/>.

²² <https://foundation.app/@DisasterGirl/disaster-girl-25046>.

²³ <https://opensea.io/assets/0x557430421f8f3ed0a92aca211f1c05ad7b606288/0>.

²⁴ <https://shorturl.at/byTW9>.

²⁵ <https://nbatopshot.com/>.

²⁶ <https://v.cent.co/tweet/20>.

²⁷ <https://onlineonly.christies.com/s/beeple-first-5000-days/lots/2020>.

Image 1: Minting a picture

There are many ways in which one can mint this picture. Assuming that we have the technical inclination and knowledge, the complicated way of turning this into an NFT would be to install an implementation of the ERC721 contract in our own computer, or to use minting tools designed to help people do just that, any digital file can be turned into an NFT in this manner,²⁸ one then can use the file to compile a contract which produces metadata that can be written to the Ethereum blockchain.²⁹ This metadata is using standards that are publicly verified and verifiable, so other intermediaries can just look at the data and see that this is a valid NFT. Because this metadata was encoded with a file and a set of private keys and private accounts, the resulting token is unique and intrinsically encoded with the original file.

The resulting NFT is a piece of code that is written into the blockchain that contains various bits of information. The ERC-721 standard contains elements that must be present, and some that are optional. The first core element to the NFT is a number known as the *tokenId*, which is generated upon the creation of the token; the second is the *contract address*, this is a blockchain address that can be viewed everywhere in the world using a blockchain scanner.³⁰ The combination of elements contained in the token make it unique, there can only be one token in the world with the combination of *tokenId* and contract address. At its very core, the NFT is those two numbers.³¹

²⁸ For example, using a tool called Minty that allows the user to turn any digital file into an NFT: <https://bit.ly/3iyRUhj/>.

²⁹ Instructions on how to do this locally can be found here: Coathup A, 'Create an NFT and deploy to a public testnet, using Truffle', OpenZeppelin Blog (March 1, 2021), <https://bit.ly/3fQjmFy>.

³⁰ <https://etherscan.io/>.

³¹ Barda V, 'ERC-721 Non-Fungible Token Standard', Ethereum Blog (June 6, 2021), <https://ethereum.org/en/developers/docs/standards/tokens/erc-721/>.

There are other important elements that can be present in the contract. One is the wallet address of the creator, which helps to identify the work with its originator.³² Another element common in most NFTs is the inclusion of a link to where the original work can be found, this is because the non-fungible token is not the work itself. Other NFTs include hashes³³ of the images used to create it, or in the case of Cryptopunks, a hash of every other Cryptopunk.³⁴

In this context, minting a work as an NFT means that a creator uses a digital work to generate a unique number that is then written into the blockchain in the shape of a smart contract using the ERC-721 standard, and this is done using a unique digital signature that belongs only to the person minting it. In principle, this is what gives the NFT its “scarcity” value, it’s supposed to be unique. In reality, anyone can mint as many versions of the same work as one wishes.

While one can do all the hard work and mint the work oneself using smart contracts and compiling the file locally, this requires some considerable technical knowledge, so most NFTs are minted using a platform or intermediary.³⁵ There are dozens of NFT marketplaces³⁶ which offer the service of minting an image, a process that can take little time. One does still need to have an Ethereum wallet address to digitally sign the file, and in some instances, one also needs funds to pay for the transaction. This is because writing information into the blockchain requires funds to generate empty transactions that will represent the contract’s data. The transaction cost varies depending on offer and demand, and it is called gas.³⁷

We are going to mint the above picture using an intermediary, in this case Mintable,³⁸ which offers a gas-less service. The first step is to upload the image to the service, and then one must have an Ethereum wallet, in this case we are using MetaMask.³⁹ We need to stop briefly to explain in some more detail what is a crypto wallet, as they are extremely important for the entire NFT infrastructure. A wallet has several uses in the cryptocurrency and blockchain space, it can be used to “store” tokens, this can include cryptocurrencies such as Ether, but it can also be used to store fungible and non-

³² Take Beeple’s *First 5000 Days*, which has a unique tokenID, a smart contract address, and the wallet address of the creator: 0xc6b0562605D35eE710138402B878ffe6F2E23807.

³³ A hash is a number (usually using hexadecimal notation) that has been generated using an input of any arbitrary length. Because the number is the direct result of the input, it is unique. See: Bellare M, Canetti R and Krawczyk H, ‘Keying Hash Functions for Message Authentication’ in Neal Koblitz (ed), *Advances in Cryptology* (Springer 1996), at 34.

³⁴ The contract can be found here: <https://github.com/larvalabs/cryptopunks/blob/master/contracts/CryptoPunksMarket.sol#L5>.

³⁵ A good explanation of some of the various technical elements involved in an NFT can be found here: Posth S, ‘Four Lessons of Cryptoart’, Posth Werk Blog (6 June 2021), <https://posth.medium.com/four-lessons-of-cryptoart-efb7d7108791>.

³⁶ Mintable, OpenSea, Rarible, Foundatino, SuperRare, and NiftyGateway, just to name some of the most popular at the time of writing.

³⁷ <https://ethereum.org/en/developers/docs/gas/>.

³⁸ <https://mintable.app>.

³⁹ <https://metamask.io/>.

fungible tokens. A wallet is a cryptographic address that exists in the blockchain,⁴⁰ and it is public. But most importantly, the wallet is generated using a private key created by its owner, and this key can also be used to sign tokens. So whenever one is minting a work, be it locally or using a platform, the wallet address and signature are used to sign the token.

The resulting NFT can often be found online,⁴¹ but most importantly, it has been written permanently in the blockchain, and the resulting file contains the following metadata:

```
"symbol": "Mintable Gasless store"
"image": "https://d1iczm3wxz9zd.cloudfront.net/8f3b45b2-5744-45e3-
b201-774f4adb0899/000000-0000000000
/5674296857165156784247047673228983525689876364216577782762901276532434600339
/ITEM_PREVIEW1.png"
"animation_url": ""
"royalty_amount": 500
"copyright_transfer": false
"address": "0x8c5aCF6dBD24c66e6FD44d4A4C3d7a2D955AAad2"
"tokenId": "567429685716515678424704767322898352568987636421657778276290127653
"resellable": true
"original_creator": "0x0C8B89C808c37f20547B75eF5b17ED8b8C97bb98"
"edition_number": 1
"description": "<p>This charts my mouse during a day.</p>"
"auctionLength": "604800"
"title": "A day in the life"
"url": "https://metadata.mintable.app/mintable_gasless
/5674296857165156784247047673228983525689876364216577782762901276532434600339"
"file_key": ""
"apiURL": "mintable_gasless/"
"subtitle": "Digital life is everything"
"name": "A day in the life"
"auctionType": "Auction"
"category": "Art"
"edition_total": 1
"gasless": true
```

Image 2: NFT Metadata

As it can be seen above, the NFT is not the work itself, it is the metadata file that contains the unique combination of tokenId⁴² and contract address.⁴³

It's important to point out that while the resulting NFT can contain other information such as the name of the work, the name of the author, the copyright status of the work, and as many other details as one feels like including. The tokenId and the contract address being the most important elements, as they are linked specifically to both the original work and the signature used to generate the token.

⁴⁰ See an example of a wallet here:

<https://etherscan.io/address/0x0C8B89C808c37f20547B75eF5b17ED8b8C97bb98>.

⁴¹ https://mintable.app/art/item/A-day-in-the-life-Copyright-article-experiments/Zs_7_5nX-VXJcsW.

⁴² 5674296857165156784247047673228983525689876364216577782762901276532434600339

⁴³ 0x8c5aCF6dBD24c66e6FD44d4A4C3d7a2D955AAad2. This can be viewed online here: <https://etherscan.io/address/0x8c5aCF6dBD24c66e6FD44d4A4C3d7a2D955AAad2>.

The most important takeaway from the above is that the actual image is not the NFT, and it is not a part of the NFT other than by the presence of a URL that directs to the image. This will be discussed further later, but for now let's stress the fact that while the image was used to encode the NFT and make it uniquely attached to the image, the NFT is not the actual image itself, it is the metadata that ties it to the original file.

When someone is purchasing an NFT, they are purchasing the metadata file, and as a non-fungible token, this is transferrable as well. Some people have therefore compared NFTs with a signed copy of a work, which is somewhat inaccurate as the NFT is not a copy itself, it's more like a signed receipt of a work, where the ownership is not of the work itself, but it's ownership of the receipt.

There is another type of NFT where the work is uploaded in its entirety to the blockchain, these are truly blockchain native works and are often referred to as on-chain works, and they can only be exchanged and transferred with other people on the blockchain, so the NFT acts more like true ownership of the work. There are not many projects that upload the full work to the blockchain in this manner.⁴⁴ The reason for this is because the cost of writing data into the blockchain is prohibitively expensive, and this is so by design. In Ethereum, the cost of uploading a kilobyte of data is set at 640,000 gas.⁴⁵ The cost of gas changes from day to day, at the time of writing this would amount roughly to \$15.15 USD per kb.⁴⁶ However, the cost in gas goes up by design precisely to dissuade users from clogging up the network with useless data, so the more you upload, the more it costs to upload it.⁴⁷ So while the cost of 1 kb is 640,000 gas, the cost of uploading one MB is 655 million gas. Things become more complicated because there are different types of storage on the blockchain, with high speed of transaction, and high gas price, Palau calculates that uploading one megabyte of data could be as high as 32 ETH (\$71,410 USD at the time of writing).⁴⁸

Given the costs there is little use in using the blockchain to store data, which is the main reason why NFTs consist of small metadata files. The image itself can be stored by a platform, or can also be stored online using a file storage service, and even a blockchain friendly distributed filing system called an IPFS (Interplanetary File System).⁴⁹

3. NFTs as digital rights management

Reading the above description of NFTs from a technical perspective, one could be forgiven for not thinking about copyright at all. For the most part a non-fungible token is a metadata file that has been encoded using a work that may or may not be subject to

⁴⁴ An example that uploads the entire image on-chain is Avastars, <https://avastars.io/>.

⁴⁵ As explained in this Ethereum yellow paper: Wood G, Ethereum: A secure decentralised generalised transaction ledger, EIP-150, <http://gavwood.com/paper.pdf>.

⁴⁶ This was calculated using the Ethereum Gas price calculator at <https://ethgasstation.info>. Gas has its own cost unit, called the Gwei, which also changes depending on demand. At an average price of 10 Gwei, the total cost in Ethereum is 0.006784 ETH, and the price of ETH is 1 ETH = 2,233.53 USD, which produces an average cost of \$15.15 USD per kb.

⁴⁷ Palau A, 'Storing on Ethereum. Analyzing the costs' Coinmonks Blog (July 17, 2018), <https://medium.com/coinmonks/storing-on-ethereum-analyzing-the-costs-922d41d6b316>.

⁴⁸ Ibid.

⁴⁹ <https://ipfs.io/>.

copyright protection, or it could even be a work on the public domain, as will be discussed later.

As explained above, anything that is subject of being digitised can be turned into an NFT, but the original work is only needed in the first step of the process, namely the creation of a unique combination of a tokenID and contract address. So, in principle there is very little interaction with copyright.

However, there is growing misunderstanding when it comes to the ownership of an NFT, and what exactly it represents.⁵⁰ There is an increasing amount of popular press coverage of the NFT phenomenon, mostly fuelled by hype and stories of works being sold as an NFT. The problem rests in the very reporting of these sales, which seem to assume that what is being sold is the work itself, and not a digital representation of the work. Take for example the story of Jack Dorsey's first tweet. Dorsey is the Twitter CEO, and a big proponent of cryptocurrencies, and on March 2021 he sold an NFT of his very first tweet in a marketplace called Cent,⁵¹ which specialises on these tokens. The technology sections of several news websites reported the same story as if the tweet had been sold, and not a token of the tweet: "Jack Dorsey's first ever tweet sells for \$2.9m" said the BBC.⁵² "Twitter CEO Jack Dorsey sells first tweet as an NFT for \$2.9M", wrote CNET.⁵³ Many other publications went with similar headlines,⁵⁴ giving the impression that the actual tweet had been sold. The news, and the accompanying perception, is inaccurate, the tweet did not sell because it was never for sale. What was sold was not the actual tweet, but a non-fungible token of it.

The problem is in part to do with the prices that are being paid for these tokens. An NFT of Pixel, a picture of a grey square by digital artist Pak, sold for \$ 1.3 million USD at auction,⁵⁵ while an NFT of a virtual plot of land in the game Axie Infinity was sold for \$1.5 million USD.⁵⁶ It seems difficult to believe that all these buyers are spending such amount of money for what amounts to a short metadata file and a string of numbers and letters of dubious artistic value,⁵⁷ but in fact this is what most NFTs actually are. This is even despite

⁵⁰ Take for example this NFT owner who manages to completely misunderstand the nature of the asset: <https://twitter.com/RookieXBT/status/1421548360868286464>.

⁵¹ <https://v.cent.co/>.

⁵² Harper J, 'Jack Dorsey's first ever tweet sells for \$2.9m', BBC News (March 23, 2021), <https://www.bbc.co.uk/news/business-56492358>.

⁵³ Reichert C, 'Twitter CEO Jack Dorsey sells first tweet as an NFT for \$2.9M', CNET (March 22, 2021), <https://www.cnet.com/news/twitter-ceo-jack-dorsey-sells-first-tweet-as-an-nft-for-2-9m/>.

⁵⁴ Armental M, "Jack Dorsey's First Tweet Sells as NFT for \$2.9 Million", The Wall Street Journal (March 22, 2021), <https://www.wsj.com/articles/jack-dorseys-first-tweet-sells-as-nft-for-2-9-million-11616455944>.

⁵⁵ The NFT smart contract can be found here: <https://etherscan.io/address/0xc7cc3e8c6b69dc272ccf64cbff4b7503cbf7c1c5>.

⁵⁶ <https://twitter.com/seedphrase/status/1358918272767324160>.

⁵⁷ For more on this see: Keeper S, 'The NFT's Aura, or, Why Is NFT Art So Ugly?' Storming the Ivory Tower Blog, <https://www.stormingtheivorytower.com/2021/06/the-nfts-aura-or-why-is-nft-art-so-ugly.html>; and Frye BL, 'NFTs & the Death of Art' (Social Science Research Network 2021) SSRN Scholarly Paper ID 3829399, <https://papers.ssrn.com/abstract=3829399>.

the recognition of most sellers that no copyright is being transferred, so most popular NFTs such as Cryptokitties and Cryptopunks do not involve copyright transactions.⁵⁸

3.1 Assignment

Nonetheless, there is potentially a copyright element in at least some NFTs. There are situations in which a work may be minted without the author's permission, prompting questions of copyright infringement, which will be dealt with later.

While most NFTs do not involve a transfer of rights,⁵⁹ there are a few instances in which the seller offers to turn the token into an actual transfer of copyright ownership in the original. Some platforms offer to build in copyright elements into the sale, such as copyright transfer; Mintable for example includes a tick-box that allows the person minting a work to "Transfer Copyright", and this is included in the final smart contract (see Image 3). A few platforms are even being built with copyright transfer in mind, Hup Life is an NFT marketplace that builds into their contracts a "Berne compliant" copyright transfer of rights.⁶⁰

Item description

Paragraph ▼ **B** *I*

The better the description the higher chance of selling your item...

☐ Transfer Copyright when purchased?

When a buyer purchases this item, they have the rights to use the file commercially.

Image 3: Copyright transfer interface in Mintable.

The first question to ask is whether such a minimalistic form could act as a valid transfer of rights. The "enjoyment and exercise" of copyright is devoid of formalities in accordance with Art 5(2) of the Berne Convention,⁶¹ this means that the subsistence of copyright does not rest on the compliance with formal requirements, rights will exist if the work meets the requirements for protection set out by national law and treaties. While there is no constitutive formal requirement, some jurisdictions necessitate some sort of formality with regards to the alienation of those rights, and while there is no

⁵⁸ Evans TM, 'Cryptokitties, Cryptography, and Copyright' (2019) 47 AIPLA Quarterly Journal 219.

⁵⁹ As evidence of this, we opened the first 12 NFT sales in the marketplaces OpenSea, Rarible, and Mintable on July 4 2021, and none of the sales involved a copyright transfer. See the list of works here: https://docs.google.com/document/d/1NHkNz0mTrHtcCoZVvVXwpPnsOW8_wNbIMrKaeJ90dRg/edit?usp=sharing

⁶⁰ <https://www.hup.life/>.

⁶¹ Berne Convention for the Protection of Literary and Artistic Works 1886.

harmonisation on the extent of those formalities,⁶² it is a matter for each jurisdiction to set out what the requirements will be.

With regards to the transfer of copyright, the Copyright Designs and Patents Act (CDPA)⁶³ requires a copyright assignment that is “in writing signed by or on behalf of the assignor”.⁶⁴ In the widest sense, an assignment of copyright means that the ownership of a work will be transferred to the assignee, and they can therefore do with the work as they please.⁶⁵ The copyright assignment can be for all of the ownership, but also can be broken down into different rights, for example, the author can assign rights to an exclusive right of the author, or can even assign to a specific territory.⁶⁶ Therefore a written requirement is of particular importance as it can specify the type and length of rights assigned.

But what does “in writing” and “signed” mean exactly? It is accepted widely that electronic documents can be used to conduct contracts,⁶⁷ and while a copyright assignment is not necessarily a contract as such, the relevant interpretation and case law with regards to written and signature requirements can elucidate what can be considered a valid assignment. Similarly, it is also widely accepted that whenever there are written requirements in law, these can be fulfilled by a wide range of technologies as the definition of what is “written” is to be interpreted broadly to encompass “typing, printing, lithography, photography and other modes of representing or reproducing words in a visible form”.⁶⁸ Over the years, the definition of what is “written” has been interpreted widely to accommodate various types of formats, from an electronic personal organiser,⁶⁹ to an email.⁷⁰ And specifically about copyright assignment, the definition of what is a written document has also been broad in its interpretation, and even a receipt has been deemed to be enough to fulfil this requirement.⁷¹ However, even if the assignment can be minimal and in electronic format, it still needs to clearly identify the work. This could prove to be slightly more difficult to evidence in some NFTs, as the assignment is performed in computer code.

As to the signature requirement, the law here is also generally welcome to the use of electronic signatures whenever there is such a requirement. The law governing electronic signatures in the UK is the eIDAS Regulation,⁷² which defines an electronic

⁶² Dreyfuss RC, "An Alert to the Intellectual Property Bar: The Hague Judgments Convention," (2001) University of Illinois Law Review 421.

⁶³ Copyright Designs and Patents Act 1988 s90(3).

⁶⁴ *ibid.*

⁶⁵ Bently L and others, *Intellectual Property Law* (5th ed, Oxford University Press 2018), p 305.

⁶⁶ *Ibid.*

⁶⁷ See in particular Art 9 of the Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market, L178/2000/1.

⁶⁸ Schedule 1 of the Interpretation Act 1978.

⁶⁹ *Rollo v HMA* 1997 JC 23.

⁷⁰ *Immingham Storage Co Ltd v Clear plc* [2011] EWCA Civ 89.

⁷¹ *Savoury v World of Golf* [1914] 2 Ch 566.

⁷² EU Regulation 910/2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC.

signature as “data in electronic form which is attached to or logically associated with other data in electronic form, and which is used by the signatory to sign”. Similarly, Art 25.1 of the Regulation clearly states that an electronic signature “shall not be denied legal effect and admissibility as evidence in legal proceedings solely on the grounds that it is in an electronic form”. What this means in practical terms is a wide range of types of signatures being accepted as valid by the courts. For example, an email can be a valid signature if it shows the intention of it being a signature, as well as containing the name of the signatory party.⁷³

While existing rules are broad and inclusive to various electronic formats, it’s not yet clear if this could include the type of cryptographic signature that is used to sign an NFT. As described in the previous section, an NFT is created using a unique signature that the person minting the token can create, the signature is a cryptographic key that only the owner has access to. The Law Commission of England and Wales has been favourable in its wide interpretation of what is considered a signature,⁷⁴ allowing not only for a wide range of physical signatures, but also for various electronic formats. There has also been a recent consultation by the UK Jurisdiction Taskforce looking specifically at cryptographic assets such as tokens,⁷⁵ and they believe that there is no reason to believe that private-key signatures would not be classed as electronic signatures for any legal purpose. They believe that even in situations where a document has been signed using proprietary tools, this could still be a digital signature, and while this does not mention wallets specifically, it is implied in the definition.

With regards to the use of a tick box to generate a copyright assignment, this could be akin to what is known as a click-wrap agreement,⁷⁶ namely legal documents that are usually entered into by the click of a button. This is a widely accepted practice, and there is substantial case law accepting the use of “I Agree” click buttons, and even tick boxes.⁷⁷ It would appear that as long as it is clear that the party is willing to make a copyright assignment according to what they “say and do”,⁷⁸ then the ticking of a box, the filling of a form, and the signing of a token electronically could all be taken together to evidence the existence of an assignment.

With all of that in mind, there could still be a little bit of doubt as to whether a token written in code could meet the written requirements. While opinion is divided regarding the formal validity of smart contracts as contracts,⁷⁹ there is growing

⁷³ *Mehta v J Pereira Fernandes SA* [2006] EWHC 813 (Ch) at 18-24.

⁷⁴ Law Commission, *Electronic Commerce: Formal Requirements in Commercial Transactions: Advice* (2001) and Law Commission, “Electronic execution of documents” (Law Com No 386, 2019), <https://www.lawcom.gov.uk/project/electronic-execution-of-documents/>.

⁷⁵ UK Jurisdiction Taskforce, *Legal statement on cryptoassets and smart contracts* (2019) <https://tinyurl.com/esfkuzd2>.

⁷⁶ For more on this topic, see: Gatt A, ‘Electronic Commerce — Click-Wrap Agreements: The Enforceability of Click-Wrap Agreements’ (2002) 18 *Computer Law & Security Review* 404; and Boykin D, ‘Survey of E-Contracting Cases: Browsewrap, Clickwrap, and Modified Clickwrap Agreements’ (2012) 68 *ABA Business Law* 257.

⁷⁷ See for example the Scottish case of *Beta Computers (Europe) Ltd v Adobe Systems (Europe) Ltd* 1996 SCLR 587; and the US case of *ProCD Inc v Zeiderberg* 86 F.3d 1447.

⁷⁸ *Muirhead and Turnbull v Dickson* (1905) 7 F. 686 at 694.

⁷⁹ Cannarsa M, ‘Interpretation of Contracts and Smart Contracts: Smart Interpretation or Interpretation of Smart Contracts?’ (2018) 26 *European Review of Private Law* 773; and Guadamuz A, ‘All Watched Over

recognition that these could act as valid forms of transferring rights. However, authors may want more assurance than a potentially tenuous legal analysis, so there could be other options that bypass the technical aspect. There is nothing stopping an author from using both an NFT to transfer ownership of a digital asset electronically, while writing a document in natural language and with a physical signature to ensure the buyer that there has been a proper transfer of rights. This is the preferred solution of some platforms that are offering copyright transfer as part of their services. The platform Hup Life is planning to include what they call a “second layer NFT” which will comply with copyright formalities in order to “transfer a full bundle of rights”.⁸⁰

3.2 Registration

Besides copyright assignment, could an NFT be used in other types of digital rights management? Smart contracts in general have been heralded at some point as potential copyright management tools,⁸¹ including licensing, micropayments, and registration, just to name a few.⁸² Some platforms are also suggesting the use of NFTs specifically in the management of rights, collectible tweet specialist Cent lists the following as potential uses of non-fungible tokens:

- *Indisputable rights and royalties on projects.*
- *Licensing contracts with guaranteed terms.*
- *Authenticity verification for any digital file.*⁸³

However, the reality of NFT has fallen short of this promise, and perhaps the widest use has been the transfer of the token itself, with a few acting to assign rights. As stated above, it is difficult to find NFTs that perform any other function. That is not to say that the potential is not there.

In some way, all NFTs could be seen as a form of registration, as the blockchain could operate as a way of making a claim in an immutable ledger, and thus it could also act as some form of authenticity and verification. This idea however quickly runs into a few practical problems. As mentioned in the first section, anyone with sufficient technical knowledge and the appropriate tools can generate their own token, and this token can include any information that is entered by the author. This means that one can make any sort of erroneous ownership claims, and then this is written into the blockchain. Moreover, one could even generate a token made from works that one does not own.

by Machines of Loving Grace: A Critical Look at Smart Contracts’ (2019) 35 Computer Law and Security Review 1.

⁸⁰ <https://www.hup.life/#terms>.

⁸¹ Bodó B, Gervais D and Quintais JP, ‘Blockchain and Smart Contracts: The Missing Link in Copyright Licensing?’ (2018) 26 International Journal of Law and Information Technology 311.

⁸² Guadamuz A, ‘Smart Contracts, Blockchain and Intellectual Property: Challenges and Reality. In: Intellectual Property and the 4th Industrial Revolution. Kluwer International Law, Amsterdam.’ in Heath, Kamperman Sanders and Moerland (eds), *Intellectual property and the 4th industrial revolution* (Kluwer Law International 2020).

⁸³ Cent, ‘Valuables FAQ’ (2021), https://docs.google.com/document/d/1kBx-HXY8ow_7bElsjZ6Sk3r2V9cQjSRdWFyKCUXZtAs/edit.

This is not an outlandish claim, and as it will be seen in the next section, it's increasingly taking place, as artwork is made into an NFT without the author's permission.⁸⁴ We cannot rely on NFTs for registration and authenticity as large numbers of works for sale appear to have dubious origin, or the originality could be contested.⁸⁵ Take an image of a prototype character of the popular game *Among Us* is being sold with a copyright transfer,⁸⁶ but there's no indication if this is an original work, or if the author has permission to do so. Garbage in, garbage out, just because there is an ownership claim written in the blockchain, it doesn't mean that it's true.⁸⁷

NFTs could work for registration with some sort of institutional verifying authority issuing them. NFT marketplace platforms could potentially fulfil this requirement, but other than sometimes removing listings that do not comply with their terms of use, they seem reluctant to act in this manner. A few platforms are offering authentication services as their selling point, which would act closer to a private register.⁸⁸

Nonetheless, there is a hierarchy of platforms forming now. The auction house Christie's has embraced the NFT revolution fully, listing some of the most successful and valued NFTs, such as Beeple's *First 5000 Days*, and Sir Tim Berner's Lee's WWW code. While it is not a register by any definition of the word, a listing by Christie's acts in some manner as a seal of quality and provenance. There is then a lower tier of platforms that also offer more exclusive tokens, such as Nifty Gateway and Foundation, which also specialise in celebrity drops and high-end tokens. Next down are other less exclusive platforms such as Rarible and OpenSea, with a bottom pile of other platforms such as Mintable and Cent with very little user verification.

There is another advantage in using a platform that has some sort of verification mechanism, and it is that it may be possible for hackers to seemingly replicate an NFT, even making it look like it came from an address, this is what is known as "sleepminting", in which a third party can mint a work without authorisation making it appear as if it came from the author.⁸⁹

3.3 Licensing

What about licences? In theory it is possible to code into a smart contract any type of agreement, and if we take a licence to be a legal document that allows a user to perform an action otherwise restricted by copyright, then this can be achieved as well with an NFT. However, a survey of the major NFT platforms at the time of writing did not produce any cryptographic smart contract licence in the shape of an NFT, but this does

⁸⁴ Digital artist Corbin Rainbolt is just one of the many artists complaining about NFTs that have been created without their permission, see:

<https://twitter.com/CorbinRainbolt/status/1369433485086195717>.

⁸⁵ Take this digital design of a famous photograph of Elon Musk smoking during Joe Rogan's podcast:

<https://foundation.app/@grassetti/cryptohistory-02-tothemoon-2911>.

⁸⁶ <https://mintable.app/Collectibles/item/Black--15--Among-Us/5jmqW0RvtEDHnpT>.

⁸⁷ Another example is a man who made a copyright claim for the Mona Lisa, see:

<https://verisart.com/works/23f2c64a-08c6-4a42-8013-84ac8422dffb>.

⁸⁸ See for example UREEQA, a platform that claims to conduct "ownership, authorship & originality" checks in the creation of an NFT: <https://www.ureeqa.com/>.

⁸⁹ A hacker using the alias Monsieur Personne successfully minted a replica of Beeple's *The First 5000 Days*: <https://nfttheft.com/>.

not mean that such a licence does not exist, just that it is not very common. What appears to be more common is for an author to grant the buyer of an NFT with a licence to use the work for a certain period of time. An example of this is the viral video “Charlie Bit Me”, which was sold as an NFT in June 2021 for approximately \$500k USD, and besides the purchase of a token of the video, the buyer would be granted “worldwide license to use, exploit and display the Purchased NFT.” Interesting wording, meaning that the licence is for the NFT, and not for the video itself.⁹⁰ Another popular collectible series that uses the NFT to grant a licence is Bored Ape,⁹¹ a series of collectible “unique” apes offered in the Rarible and OpenSea platforms, where the buyer receives a licence to use each version of their ape personally and for commercial uses. An example of the licence (which exists in the Platform, not the NFT itself) states:

“The owner of Bored Ape #6068 grants the owners of this License (“Bored Ape #6068 Royalty-Free Usage License + Source Files NFT”) an unlimited, worldwide license to use, copy, and display the licensed Art (“Bored Ape #6068 Source Files”) for the purpose of creating Derivatives (“Bored Ape #6068 Derivative Art”) based upon the Art (“Commercial Use”), provided that you can cryptographically verify your ownership of the License (“Bored Ape #6068 Royalty-Free Usage License + Source Files NFT”).⁹²

So while the NFT is not the licence, it can be used to prove ownership of the NFT, and therefore to prove to the work’s owners that they can undertake commercial activities using the original artwork. The NFT is evidence of the legitimacy of using the licensed work. The inclusion of such a licence is becoming a standard in some parts of the NFT community, so much so that some enthusiasts have even created an NFT licence that creators can include and link to in their drops.⁹³

The reason for this seemingly convoluted manner of using NFTs is because the format itself tends to be limited, and the copyright owner will prefer to have more control over the work using a normal licence attached to the work itself, and not to the NFT, whose existence is just metadata in the buyer’s wallet. This opens the question of why anyone would pay thousands for such a file. The NFT community has been finding out that a token is not ownership of rights and does not confer a licence automatically.⁹⁴

3.4 Royalties

The other main use of an NFT is to try to obtain royalties for a work, and this is an area where the technology is really having a positive effect for artists. While we can argue that the use of NFTs for copyright assignment and licensing is limited, the built-in payment capability of the smart contract allows authors to receive immediate payment

⁹⁰ Another example is a documentary that is offered as an NFT with an additional licence to use the clip for 15 years, see: <https://bit.ly/3zgyMuf>.

⁹¹ For an explanation of the Bored Ape NFTs, see: Harwood P, ‘Pranksy & The Bored Apes: Using Nansen for NFT Alpha’ Nansen Blog (July 13 2021), <https://www.nansen.ai/research/pranksy-the-bored-apes-using-nansen-for-nft-alpha>.

⁹² <https://bit.ly/3yVmozl>.

⁹³ See: <https://www.nftlicense.org/>.

⁹⁴ See this interesting discussion thread: <https://twitter.com/spencecoin/status/1418457068986454018>.

for their work, even when what is being sold is mostly a database entry. Regardless of what one may think about the cryptocurrency market and the long-term feasibility of the token market, there's little doubt that people are buying NFTs at exorbitant prices, and this is benefitting those content creators that are able to take advantage of the hype.

When an author mints and sells a token at an auction platform, the buyer will have funds in a cryptocurrency wallet, most likely Ether, and the highest bidder will transfer funds to the seller, the asset will then be transferred from the seller's wallet to the buyer's, where it will reside until it is transferred again. Here's where the smart contract can shine in different ways.

For example, French musician Jacques released a song called "Vous" and created one NFT for each second of the song (191 in total).⁹⁵ So fans can purchase a token that represents a second of the song. The interesting part of this experiment is the Jacques claims that this is actual share from the profits of the song, so there will be 191 co-owners of the piece, each receiving shares from the royalties obtained from it from any source, and this will be paid directly to the NFT's owner wallet (0.51% of the royalties for each token). While the NFT is not a transfer of rights itself, the buyer of each second purchases rights to the song, as well as other perks such as a signed limited-edition vinyl, and a signed visual contract of the actual transfer of rights. At the time of writing each second was selling for just under a thousand dollars (0.48 ETH), and almost all seconds had been sold, giving the author a profit of over \$150k USD. It's not clear if the song will make enough in royalties to make it worthwhile for each buyer, but it's still an interesting experiment in community building using NFTs.

Another way in which NFTs can act in the collection of royalties is in the inclusion of an automated resale clause in the smart contract. Some platforms allow creators to specify a resale percentage, for each further sale of the token the creator will receive a specific percentage of that further transaction. Rarible for example marks this as "royalty", and sets the percentage maximum of 50%, but recommends between 0% and 10%. In some way this setting is a technical *droit de suite* where artists would obtain automated proceeds for each further transaction of the token. It is not difficult to see how this system is appealing to authors as it guarantees future earnings in a manner that the law cannot. Furthermore, when we consider that for the most part the author would also retain full copyright even after selling the NFT, this benefits them considerably. Contrast this with the existing resale right in the UK as implemented by the Artist Resale Rights Regulations 2006 (ARRR),⁹⁶ which is very limited in scope and implementation.⁹⁷ The resale right applies only to works that have been purchased from an intermediary that exceed €10,000 EUR, and the royalty is calculated on the basis of the amount of the resale on a sliding scale, where a work sold for a price of up to €50,000 EUR would get a 4% royalty, while a work sold in excess of €500,000 EUR would get 0.25%. The royalties are also capped at €12,500 per sale.

The advantage of the author choosing the NFT route is immediately evident, an artist that sells an NFT and sets the resale royalty at 10% will always recover that amount

⁹⁵ <https://jacques.live/nft>.

⁹⁶ And expanded to the full duration of copyright in the Artist's Resale Right (Amendment) Regulations 2011.

⁹⁷ For more on the subject, see: Banternghansa C and Graddy K, "The Impact of the Droit de Suite in the UK: An Empirical Analysis" (2011) 35 Journal of Cultural Economics 81.

after each resale, and this is not subject to the exceptions of the ARRR, it is also paid directly to their wallet on the completion of each transaction.

From the perspective of the artist, we are just starting to explore the various possible uses of the technology, with many other platforms being created with royalties and digital rights management in mind. The only question is that of whether the market can maintain the current hype cycle, and this is still to be answered. There is evidence that early 2021 was part of a wider cryptocurrency bubble, and at least at the time of writing the market has been slowing down both in the number of sales and the volume of offerings.⁹⁸ Buyers may be wising up to the fact that what they get when they purchase an NFT is not the actual work, but a digitally-signed ledger entry of a work.

For now, artists are using the popularity of NFTs to enhance their drops with extras and other items, for example, sending a physical copy of the artwork to the buyer of the digital token.⁹⁹ Some come with a subscription to a magazine,¹⁰⁰ or with a subscription to a community of owners.¹⁰¹

4. Copyright infringement and NFTs

4.1 Potential for infringement

While the digital rights management aspect might prove to be an important part of the tokenisation scene, the potential for copyright infringement could have a more immediate effect on the development of NFTs. Given the hype that exists about the technology, as well as the prices that are being paid for NFTs, there's considerable scope for legal action in this area.

This is not just idle speculation, and we are already seeing a few instances of possible copyright infringement taking place, and even a cursory look at marketplaces produces many different infringing listings.¹⁰² First there was the Basquiat drawing mentioned in the Introduction. Then some artists started complaining on social media that their works were being minted into NFTs without their permission,¹⁰³ and there was even an instance of works in the public domain from the Rijkmuseum in Amsterdam that were turned into an NFT.¹⁰⁴ Entire collections are propping up filled with infringing works.¹⁰⁵ Most of these instances of potential infringement were solved outside of the courts, usually by the removal of the token from the auction platform.

⁹⁸ 'The NFT market bubble has popped and we've got the charts to prove it', Protos Blog (June 3 2021), <https://protos.com/nft-market-bubble-popped-crypto-collectibles-are-over/>.

⁹⁹ An example here: <https://rarible.com/token/0x60f80121c31a0d46b5279700f9df786054aa5ee5:1111629>.

¹⁰⁰ <https://rarible.com/token/0x4813c06eb9919db20634c431565d6b88f35501ff:10016?tab=owners>.

¹⁰¹ For example, the Bored Ape Yacht Club: <https://boredapeyachtclub.com/>.

¹⁰² Found this copy of Mickey Mouse in a few seconds: <https://opensea.io/assets/0x495f947276749ce646f68ac8c248420045cb7b5e/89884968542310325637265843172128326556060595321012682519336070810111867617281>.

¹⁰³ One example here: <https://twitter.com/WeirdUndead/status/1369210982518693888>.

¹⁰⁴ Guadamuz A, 'Copyfraud and copyright infringement in NFTs', Technollama Blog (March 14, 2021), <https://wp.me/pwh3D-3es>.

¹⁰⁵ See: <https://mintable.app/u/samklnft>.

The first legal action involving copyright infringement is currently underway in the United States, and involves hip-hop artist Jay-Z. In 1996 Jay-Z released his debut album called *Reasonable Doubt* with the label Roc-A-Fella (RAF), which was cofounded by producer Damon Dash. The producer is now only a minority shareholder with RAF, but in June 2021 he announced that he would be listing an NFT of *Reasonable Doubt* with the collectible platform SuperFarm (the listing has since then been removed).¹⁰⁶ RAF is the copyright holder in the album, so they immediately sued Dash claiming copyright infringement.¹⁰⁷ A judge issued a temporary restraining order stopping the sale,¹⁰⁸ and the case is ongoing at the time of writing.

While it is difficult to analyse this case at such an early stage, there is no doubt that it opens quite a few questions, particularly whether there is even copyright infringement involved in the minting of a work, even if one is not the owner. This could appear to be an easy question to answer, clearly there must be some form of copyright infringement in the minting of an NFT without permission, that is, until we really try to analyse what an NFT is, and how it is generated. It is then those doubts start to surface. If an NFT is mostly metadata of a work, is it really infringing to generate that code and write it to the blockchain?

Here is where having a precise understanding of the technical characteristics of what is a non-fungible token become relevant. As we have seen, most NFTs are a code file that has been generated with a digital work. As explained in the first section, one takes a digital file and then uses it to produce two core components of this file, a uniqueID and a blockchain address. The code itself acts as a smart contract that exists in the blockchain as well. But this code often has other information, the most common element that is included is a URL to the work itself.

From a copyright perspective it is difficult to see how the minting of an NFT, even without authorisation, could be considered copyright infringement. As the NFT is not the work, but a string of numbers that have been generated with a work, the resulting file could not be considered a reproduction of the work, or even an adaptation. At most we could be looking at some form of communication to the public, but we will get to that later.

4.2. Copyright infringement

For there to be infringement, there are three requirements that must be met: i) the infringer undertook one of the **exclusive rights** of the author without authorisation; ii) there is a **causal connection** between both works; and iii) the **entirety** of the work, or a **substantial** part of it, has been copied.¹⁰⁹

We will tackle these out of sequence for reasons of complexity. Looking at whether there is a **causal connection** between the works, we can admit that a token is derived from an original work in a technical manner, one needs to have access to a digital version of the work to make an NFT, so we can probably grant that connection. Over the years the question of a work being derived from another has been factual, and even

¹⁰⁶ Robertson A, 'An NFT of Jay-Z's first album has sparked a record label lawsuit', The Verge (June 21, 2021), <https://bit.ly/3ii6ato>.

¹⁰⁷ The text of the complaint can be found here: <https://bit.ly/2URaZSE>.

¹⁰⁸ Roc-A-Fella Records v Damon Dash, Case 1:21-cv-05411-JPC, <https://bit.ly/3hHBOS3>.

¹⁰⁹ Bentley et al, supra note 65 at p194.

though two works could be similar, there may not be a connection between one and the other, and they may have been created independently.¹¹⁰ Conversely, there's no doubt that in the case of a token the connection is there.

Going to the question of whether a work has been copied in its **entirety or in a substantial manner**, the answer will depend on the type of NFT. If the NFT is on-chain, and therefore fully uploaded to the blockchain, then undoubtedly there is direct copying of the work, and it could be considered *prima facie* copyright infringement. However, as it has been mentioned, this is rarely the case because of the prohibitive cost of doing so. As most NFTs are code-only tokens, then it is evident that there is no substantial copying of the work, as the token is just code that does not represent the work at all, it is just code that was generated with the work. It is important to stress that while the actual NFT is just code, there could be a listing in a website with infringing material, we will go into that later.

Leaving the first element for last, as it is more complex, can we consider an unauthorised minting of a work as an activity that falls under the **exclusive rights** of the owner? Broadly speaking, the exclusive rights of the author are the rights of reproduction, publication, lending and rental, public performance, adaptation, communication to the public, and authorisation to perform any of the above.¹¹¹ Not all of these apply to NFTs, so we will focus on *reproduction*, *adaptation*, and *communication to the public*.

First let us look at potential *reproduction* in the minting of the work itself. As it has been mentioned before, this is an easy answer if the work is on-chain. But as this is not common, for the most part the non-fungible token is encoded using an existing work, this is to ensure the uniqueness and provenance of the work, even though one can generate various "unique" versions of the same work, much like limited edition lithographs. For now, let's assume that we are producing only one token from one work, we need a copy of the work to perform the minting, which is done by digitally signing the token with a wallet using the original. Once that has been completed, we do not need the digital work at all, the NFT exists independent of that file. It would be possible for this digital version of the work to be lawfully acquired, for example, it could be a purchased digital copy of a song, or one could use an image that has been shared online under the terms of a some-rights-reserved licence such as Creative Commons.¹¹² Once minted, there is no need to make an unlawful sharing of the work.

It would also be possible for the person minting the work to do so using an unauthorised copy, such as a downloaded version of the work without permission, even by generating the unauthorised copy by taking a photograph of a painting at a museum, recording a film at a cinema, or even ripping¹¹³ a song from a streaming site. This could

¹¹⁰ Some cases where this is the case: *John Kaldor Fabricmaker UK Ltd v Lee Ann Fashions Ltd* [2014] EWHC 3779 (IPEC); and *Francis Day & Hunter v Bron* [1963] Ch 587.

¹¹¹ CDPA ss16-21.

¹¹² For more on Creative Commons, see: Corbett S, 'Creative Commons Licences, the Copyright Regime and the Online Community: Is There a Fatal Disconnect?' (2011) 74 *Modern Law Review* 503.

¹¹³ Ripping is the term used for the creation of a digital copy of a streamed work, be it an audio site like Spotify, or a video from YouTube. See: https://en.wikipedia.org/wiki/Stream_ripping.

very well be an infringing act, even if making a private copy of a work,¹¹⁴ but assuming the creator of the token only makes a private copy and does not link to the work in the NFT, then there is practically no connection from that potentially infringing copy to the token. The token is not a reproduction of the work in any sense of the word, there is no literal embodiment of anything resembling the original in the NFT.

Could an NFT be an *adaptation*? An adaptation is defined in the CDPA in very specific terms,¹¹⁵ and can only occur with an original work, namely literary, dramatic, musical and artistic work. The CDPA deals with an adaptation in different ways depending on the subject matter, so for example, an adaptation of a literary work could be to make a translation of it,¹¹⁶ to turn a literary work into pictures,¹¹⁷ or to transfer it into a format in which the story or action is conveyed in full or in part. With regards to a dramatic work an adaptation could be to make it into a film,¹¹⁸ while for a musical work an adaptation is done in the making of an arrangement or a transcription of the work.¹¹⁹

It is difficult to see how the making of a token could fit with any of these relatively narrow definitions of adaptation, and it would take a much wider interpretation to consider an NFT to be one. One could look at whether making an NFT is in some way a translation of a work into another, something akin to format-shifting.¹²⁰ In most cases where there is some form of transformation of a work into another format or medium there is often a recognisable element of the original work.¹²¹ Perhaps the most useful case when looking at this from this perspective is *Brigid Foley v Elliott*,¹²² where the knitting of a garment following instructions from a knitting guide did not infringe copyright, in effect a set of instructions is not an adaptation of a work. Similarly, Whitford J observed in *J & S Davis v Wright* that “you do not infringe copyright in a recipe by making a cake”.¹²³ Contrast this with *Moon v Thornber*¹²⁴ where the claimants had written a set of instructions on how to make a tartan pattern, and the defendants made their own version of the pattern by effectively reverse-engineering those written instructions into their own pattern, which was found to be an infringement by Birss QC

¹¹⁴ This falls outside of the remit of this work, for more on this subject see: Karapapa S, ‘A copyright exception for private copying in the United Kingdom’ (2013), 35:3 European Law Review 129-137; and Karapapa S, ‘The Requirement for a “New Public” in EU Copyright Law’ (2017) 42:1 European Law Review 63 - 81.

¹¹⁵ For more on adaptation, see: Goold PR, ‘Why the U.K. Adaptation Right Is Superior to the U.S. Derivative Work Right’ (2013) 92 Nebraska Law Review 843.

¹¹⁶ CDPA s21(3)(a)i.

¹¹⁷ For an Australian perspective, see: McCutcheon J, ‘Making art from words: the picturisation adaptation right in copyright law’, In *Research Handbook on Art and Law* (Edward Elgar Publishing 2020).

¹¹⁸ *Norowzian v Arks* [2000] FSR 363.

¹¹⁹ *Francis Day & Hunter v Bron* [1963] 1 Ch 587, at 611.

¹²⁰ While format-shifting as such is a US concept, it may be useful to look at it in this context. For more on this see: Dnes A, ‘Should the UK Move to a Fair-Use Copyright Exception?’ (2013) 44 IIC 413-444.

¹²¹ See: *Interlego A.G v Tyco Industries Inc & Ors* (Hong Kong) [1988] UKPC 3. While not a format shifting case, the similarity standard is explained well in *Designer Guild Limited v Russell Williams (Textiles) Limited* [2001] 1 All ER 700.

¹²² *Brigid Foley v Elliott* [1982] RPC 433.

¹²³ *J & S Davis (Holdings) Limited v Wright Health Group Limited* [1988] RPC 403 at 35.

¹²⁴ *Abraham Moon & Sons Ltd v Thornber & Ors* [2012] EWPCC 37.

by ruling that the defendant's pattern was an adaptation of a literary work.¹²⁵ Even taking this very wide interpretation of what is potentially an adaptation, the resulting pattern is at least connected to the original one, and one can make a copy of the pattern by following the instructions. The same is not the case in an NFT, where the code has no bearing to the work used to create it. One could perhaps try to make an argument that the token is an adaptation because it can be used to commercialise the work,¹²⁶ but this does not appear to be remotely persuasive.

Finally, the strongest argument in favour of finding some form of grounds for infringement in the unauthorised minting of a work would be to analyse whether the non-fungible token could be a *communication to the public*.¹²⁷ The right of communicating a work is a relatively recent development in copyright law that is connected with making a work available to the public by electronic means, and it is in large part enacted in order for copyright holders to have more control over their works in digital spaces.¹²⁸ Generally speaking, the right allows owners to restrict actions such as posting a film on a torrent website, or streaming music without permission, just to name a few. The work is not necessarily being infringed by the person making the communication, this could be done by someone else entirely, but it is the act of making the work available to an audience that was not intended by the rightsholder.

An unauthorised NFT could potentially be found to be a communication to the public, and again we need to look in detail at the technical aspects of what is contained in such a token. As it has been explained, one of the elements that is very common in the creation of an NFT is that the work will link to the digital copy that was used to generate the work. This is not technically necessary, but it is common practice. This element is just a hyperlink to a cloud storage service, or to a distributed IPFS service. The relevant element for the current analysis is that the work is not necessarily hosted directly by the minter, or by the platform. Looking at some famous NFTs, this link is very common, take Beeple's *First 5000 Days*, the token has a link to where the file can be found.¹²⁹ Other famous NFTs also have links to where the original can be found, such as *Nyan Cat*,¹³⁰ and *Disaster Girl*.¹³¹ In fact, if you know both the smart contract blockchain address, and the tokenID, then you can find the link to a work as long as it exists, either by looking at the code directly, or by using a service such as CheckMyNFT.¹³²

¹²⁵ *ibid* at 92.

¹²⁶ This argument could potentially use old cases such as *D'Almaine v. Boosey*, (1835) 160 Eng. Rep. 117 (K.B.) where an abridgement of a work was considered an infringement because its connection to the original made the adaptation more saleable.

¹²⁷ CDPA s20.

¹²⁸ For more on this, see: Angelopoulos C, 'Communication to The Public and Accessory Copyright Infringement' (2017) 76 *The Cambridge Law Journal* 496; and Koo J, *The Right of Communication to the Public in EU Copyright Law* (Bloomsbury Publishing 2019).

¹²⁹ <https://ipfs://ipfs/QmPAG1mjxcEQPptqsLoEcauVedaeMH81WXPvPx3VC5zUz>.

¹³⁰ <https://ipfs.io/ipfs/Qmcg8f4F9cig2JWXunxJcdBe58Q5myYXPmGfuMn1TVeswD/nft.mp4>.

¹³¹ <https://QmeQ6c5HdnEDcheHmWuKWdwMHBBZg1eGpgV5h3H2MyvdzR/nft.jpg>.

¹³² <https://checkmynft.com/>.

It is important to stress that the link may not exist, or even if it does, the link may be broken, which is increasingly a common occurrence.¹³³ What is relevant for the purpose of a possible communication to the public is that most NFTs do contain a link. However, this link may not be always easily accessible,¹³⁴ for example, the NFT contract may not be public, in which case it may be difficult to even obtain a link.

So, if a person mints a token without the owner's permission and it has no link to the work, then there is no problem, we could argue about the ethics of it, but it is difficult to see how this could be any sort of infringement. But what if the token contains a link to an infringing copy of the work? The uploading of the work itself would be a copyright infringement, but depending on some of the technology used it may be difficult to remove. For example, IPFS has been developed as a "censorship resistant" file storage system the acts by distributed storage of resources,¹³⁵ so files are stored in different nodes, making it difficult to remove.¹³⁶ So if the direct infringement files cannot be removed, then perhaps the NFT itself is a communication to the public.

A review of the case law would lead us to think that this may well be a viable legal analysis. It is accepted that posting links to an infringing file such as one hosted in a torrent website or similar is a communication to the public, and can trigger the issuing of a blocking order.¹³⁷ Particularly relevant is *Dramatico Entertainment v BSkyB*,¹³⁸ where the claimants sought an order against the popular illegal filesharing website The Pirate Bay (TPB) alleging that it served links to infringing copies of their works, and therefore it was a communication to the public; Arnold J found that there was indeed a communication as "copies of the sound recordings are made available to users who have not purchased them from an authorised source."¹³⁹ It is perfectly possible to use these cases as analogous to the link contained in an NFT, and even if it is not possible to remove the infringing copy because of the nature of IPFS storage, as it is often the case with torrent sites such as TPB. A link to an infringing copy could potentially be found to be infringing.

The Court of Justice of the European Union¹⁴⁰ has been grappling with the question of hyperlinks in recent years, and while navigating through some often-contradictory

¹³³ CheckMyNFT looked at the links contained in several tokens sold in the NiftyGateway platform, and found several contained broken links:

<https://twitter.com/CheckMyNFT/status/1371960028765245440>.

¹³⁴ Posth, supra note 35.

¹³⁵ An example of censorship resistance here: IPFS, 'Uncensorable Wikipedia on IPFS' IPFS Blog (May 4, 2017), <https://blog.ipfs.io/24-uncensorable-wikipedia/>.

¹³⁶ While it is not perfect, censorship resistance is part of the intended design. See a discussion here: <https://discuss.ipfs.io/t/how-censorship-resistant-is-ipfs-intended-to-be/7892/4>.

¹³⁷ Starting with *Twentieth Century Fox Film Corporation & Anor v Newzbin Ltd* [2010] EWHC 608 (Ch).

¹³⁸ *Dramatico Entertainment Ltd & Ors v British Sky Broadcasting Ltd & Ors* [2012] EWHC 1152 (Ch).

¹³⁹ Ibid at 70.

¹⁴⁰ While Brexit has happened, there is now clear guidance from the Court of Appeal that the existing CJEU jurisprudence will remain unchallenged. See: *Tunein Inc v Warner Music UK Ltd & Anor* [2021] EWCA Civ 441.

judgements remains difficult,¹⁴¹ one can see a few common elements emerging.¹⁴² The problem has been that the Internet relies on hyperlinking, and a very strict reading of the right to communicate to the public could lead to a serious hampering of the ability to post anything online. So, the CJEU has been involved in a balancing act between the exclusive right of the author and the interest of the public to access information, in *Svensson*¹⁴³ the court ruled that “making available the works concerned by means of a clickable link” would not be a communication to a new public, as the work had already been shared by the rightsholder. In *Bestwater*¹⁴⁴ the court ruled that the sharing of a YouTube video by framing or embedding without the express permission of the rightsholder was also not a communication to the public.

However, the case law has become more complicated with more recent decisions. In *GS Media*¹⁴⁵ the court had to consider a link from a magazine to a file hosted in a file storage service in Australia, which contained thousands of pictures from Playboy. The CJEU deviated from the previous cases as it added two new requirements, one was full knowledge that the file is infringing, and that the linking is carried out for profit. The reasoning here is that in commercial settings the person linking the content should carry out checks about whether something could be infringing copyright.¹⁴⁶ Other cases dealing with communication to the public have dealt with the potential liability of secondary infringers, namely internet service providers,¹⁴⁷ or makers of media players,¹⁴⁸ which can be used to access infringing content, and while these decisions could be relevant to platforms.¹⁴⁹

For now, it is possible to conclude that an NFT that contains a link to an infringing copy of the work could be found to be a communication to the public under some circumstances, particularly if it is evident that the minter has knowledge of the action, the “for profit” element is already met as the token is for sale. However, there is a strong counter-argument to be made against there being any communication to the public as the link differs greatly from a normal hyperlink that is found online, as it has been explained the link is sometimes contained in the code that makes up the token, and while this is often public, it may not be as easy to find as one would expect. And even if

¹⁴¹ Hanuz B, ‘Linking to Unauthorized Content after the CJEU GS Media Decision’ (2016) 11 Journal of Intellectual Property Law & Practice 879.

¹⁴² In perhaps one of the best uses of Twitter, Martin Husovec tried to explain the current case law in one tweet here: <https://twitter.com/hutko/status/773825714047033344>.

¹⁴³ *Nils Svensson and Others v Retriever Sverige AB* (Case C-466/12, ECLI:EU:C:2014:76).

¹⁴⁴ *BestWater International GmbH v Michael Mebes and Stefan Potsch* (Case C-348/12, ECLI:EU:C:2014:2315).

¹⁴⁵ *GS Media BV v Sanoma Media Netherlands BV and Others* (Case C-160/15 ECLI:EU:C:2016:644).

¹⁴⁶ For further discussion of the case, see: Czarny-Drożdziejko E, ‘Exclusive right of communication of works to the public in the legal system of the European Union’ (2021) Journal of World Intellectual Property <https://doi.org/10.1111/jwip.12192>.

¹⁴⁷ *Stichting Brein v Ziggo BV* (Case C-610/15 ECLI:EU:C:2017:456).

¹⁴⁸ *Stichting Brein v Filmspeler* (Case C-527/15 ECLI:EU:C:2017:300).

¹⁴⁹ For more on these cases, see: Ginsburg J C, ‘The Court of Justice of the European Union Creates an EU law of liability for facilitation of copyright infringement: Observations on Brein v. Filmspeler [C-527/15] (2017) and Brein v. Ziggo [C-610/15]’ (2017) Columbia Law and Economics Working Paper No. 572, <https://ssrn.com/abstract=3024302>.

the work is online, the link may be in a smart contract that has not been shared to the public, this is increasingly common (*Image 4*). The “real life” equivalent would be to infringe copyright behind closed doors.

Image 4: Example of an NFT with closed metadata.

In order to extract the link, one has to have some knowledge of the technology, and sometimes one may require knowing both the unique tokenID and the smart contract address. Most of the cases dealing with hyperlinks described above are related to common web links, or even embedding and framing, so accessing the work could be much easier. One could argue that if this is a communication to the public, then this is limited to a relatively small public, in which case the threshold of what “public” means has not been met. In *SGAE v Rafael Hoteles*¹⁵⁰ the CJEU had to determine if communication to the public was met by hotel guests watching TV in their room, and it was found that the repeated nature of various viewers could meet the threshold. It does not appear feasible to consider a small number of technical enthusiasts as members of the public, particularly because the token itself may not be published in a platform, and it will be just code in someone’s wallet. While it is possible to reverse engineer the link using the public smart contract, this is not always easy to achieve.

Moreover, while some links are posted in safe and reliable services that are designed for resilience, such as IPFS, most links are hosted by the platforms themselves, or elsewhere online.¹⁵¹ There is a growing phenomenon of what is known as “link rot”, researchers have pointed out¹⁵² that a growing number of hyperlinks in the Web lead nowhere. We could very well imagine a future of thousands of NFTs that lead nowhere, hence serving to dilute the potential argument of them infringing copyright by communicating the work to the public.

¹⁵⁰ As set in *SGAE v Rafael Hoteles SA* Case C-306/05 [2006] ECR I-11519, where a public consisting of

¹⁵¹ Kastrenakes J, ‘Your Million-Dollar NFT Can Break Tomorrow If You’re Not Careful’, *The Verge* (25 March 2021) <https://www.theverge.com/2021/3/25/22349242/nft-metadata-explained-art-crypto-urls-links-ipfs>.

¹⁵² Zittrain J, ‘The Internet Is Rotting’, *The Atlantic* (30 June 2021) <https://www.theatlantic.com/technology/archive/2021/06/the-internet-is-a-collective-hallucination/619320/>.

All of the above leads us to conclude that for the most part, even an unauthorised minting of a work may not result in copyright infringement.

3.3 Platforms

It is not possible to deal with copyright infringement in NFTs without discussing the platforms where these are sold. While some tokens can be sold directly by the issuer,¹⁵³ most NFTs are published and traded in large platforms dedicated to this market. The platform can help the issuer mint their work, and also they host a page in which the asset is listed (*Image 5*).

Image 5. A typical NFT listing.

The listing page is not the NFT itself, but these websites have the capacity of accepting payment to sell the asset, usually by allowing a buyer to connect their cryptocurrency wallet. The page also contains the issuer, the current owner (usually a wallet address), and other useful information such as a thumbnail of the work, a link to the smart contract, a link to where the work is hosted.¹⁵⁴

Because the listing contains a direct link to the work, and often even a copy of the work itself, then the platform would be considerably more open to liability for infringement than if it was just hosting the NFT code on its own. This means that NFT platforms must have very clear policies regarding copyright infringement of their customers, as well as a robust procedure for notice and takedown. The marketplace Foundation is one of the most prestigious marketplaces, and it includes the following in their terms of use:

***“Copyright Complaints:** Foundation respects the intellectual property of others, and we ask our users to do the same. If you believe that your work has been copied in a way that constitutes copyright infringement, or that your intellectual property rights have been otherwise violated, you should notify Foundation of your infringement claim in accordance with the procedure set forth below.*

¹⁵³ Take for example the NBA’s Top Shot marketplace, where you can buy an NFT of a video highlight: <https://nbatopshot.com/marketplace>.

¹⁵⁴ Image 4 is hosted here: <https://bit.ly/3ruCYUf>.

*Foundation will process and investigate notices of alleged infringement and will take appropriate actions under the Digital Millennium Copyright Act ("DMCA") and other applicable intellectual property laws with respect to any alleged or actual infringement. A notification of claimed copyright infringement should be emailed to Foundation's Copyright Agent..."*¹⁵⁵

All platforms share similar terms of use, as well as automated DMCA takedown procedures. These appear to work rather well, and most copyright infringement complaints are taken down immediately.¹⁵⁶

We could try to analyse the potential liabilities incurred by platforms while allowing users to upload content that could potentially be infringing, but at the moment they appear to be well covered by the DMCA safe harbor¹⁵⁷ by offering a clear mechanism for taking down content.¹⁵⁸ Most NFT platforms at the time of writing operate out of the USA, so the compliance with the DMCA rules is of special importance. NFT marketplaces operate in a conservative environment when it comes to a takedown request, content will be removed almost immediately without questions.

Evidence of the promptness and seriousness of the removal requests can be found everywhere, but perhaps one of the most prominent cases has been that of the removal of a collectible project called Sad Frogs District, which is composed of versions of the popular online character Pepe the Frog.¹⁵⁹ Matt Furie, the creator of Pepe, has also been issuing his own NFTs, so the Sad Frog project was in direct competition to some of his own tokens, so he issued a DMCA complaint to the platform OpenSea, and the Sad Frog District was removed.¹⁶⁰ While the developers of Sad Frog District issued a counterclaim,¹⁶¹ they did it under the name of Vladimir Putin, so the counternotice is likely to fail.¹⁶² However, this serves to stress the fact that most NFT copyright conflicts will be dealt with at the platform level.

¹⁵⁵ Found here: <https://foundation.app/terms>.

¹⁵⁶ See for example CryptoPhunks, a parody of CryptoPunks that was taken down from the platform OpenSea due to a DMCA takedown complaint: <https://twitter.com/natechastain/status/1414984322638036996>.

¹⁵⁷ Found in 17 U.S. Code § 512.

¹⁵⁸ For more on the safe harbor see: Samuelson P, 'Copyright's Online Service Providers Safe Harbors under Siege' (2020) 63 Communications of the ACM 25.

¹⁵⁹ Pepe has an interesting copyright history as a popular meme. See: Lecher C, 'Infowars settles Pepe the Frog copyright lawsuit for \$15,000', The Verge (June 10, 2019), <https://www.theverge.com/2019/6/10/18660312/infowars-pepe-the-frog-settlement-copyright-meme-alex-jones>.

¹⁶⁰ Genç E, 'Pepe the Frog's Creator Nuked a \$4 Million NFT Collection Over Copyright', Vice: Motherboard (August 20, 2021), <https://www.vice.com/en/article/akg8qk/pepe-the-frogs-creator-nuked-a-dollar4-million-nft-collection-over-copyright>.

¹⁶¹ After a statutory period following a DMCA counternotice OpenSea could reinstate the listing if there is no evidence of a copyright suit. For more on DMCA notice abuse, see: Matteson JD, 'Unfair Misuse: How Section 512 of the DMCA Allows Abuse of the Copyright Fair Use Doctrine and How to Fix It' (2018) 35 Santa Clara High Technology Law Journal 1.

¹⁶² Genç, supra note 160.

4. Copyright and scarcity

So far, this article has analysed the interaction between copyright and NFTs from a strict legal perspective, largely ignoring some of the more theoretical questions about the role of tokens and blockchain in copyright theory. While one of the objectives of this work is to look at non-fungible tokens from a neutral perspective, it is difficult not to make some judgements about the usefulness of this technology, or even if it fits adequately under copyright protection, or even if it enhances our understanding of rights management in the creative industries.

But perhaps the biggest barrier to the use of copyright in the analysis of the NFT market will be in the reason for the existence of such tokens in the first place, and it could be argued that in some ways NTs are incompatible with copyright. Smart contracts are presented as a manner to bypass regulation and enforcement at all stages, the disruption of legacy legal structures such as copyright law are the desired outcome.¹⁶³ It is no coincidence that during discussion of potential copyright infringement in the community, NFT users and artists dissuade each other from using legal recourses, instead they try to get the community itself to police possible violations.¹⁶⁴ The goal in many cryptocurrency circles is precisely to do away with the need for lawyers and copyright, in a way it tries to live by the motto of “Code is Law”.¹⁶⁵

Besides the disruptive nature of NFTS, another of the premises behind them is that of scarcity, by making non-fungible digital works available for sale, the idea is that there is value in these items because they are unique.¹⁶⁶ A creator can write a song and everyone can listen to it, but the NFT is sold as a unique version of the work that has been digitally signed by the author, this in theory makes it more valuable. NFTs are therefore better understood as collectors’ items, uniquely signed versions of the work, and not property on the original itself.

As we have argued, there is practically no ownership transfer involved in NFTs, with a few exceptions, so the scope for copyright is limited. While there appears to be a belief in some circles that an NFT is somehow a digital title to the original, an NFT is more like a receipt of a signed version of the work, and not the actual thing itself.

We could look at this from the perspective of the justifications for copyright, under some circumstances there are those who argue that scarcity itself is a part of copyright.¹⁶⁷ Under the economic justification, copyright is seen as generating value for the author because it creates artificial scarcity over the work.¹⁶⁸ Conversely, the lack of enforcement of copyright can derive if the loss of value of the work as more people have

¹⁶³ Patrickson B, ‘What Do Blockchain Technologies Imply for Digital Creative Industries?’ (2021) 30 Creativity and Innovation Management 585.

¹⁶⁴ This Twitter discussion is typical of this line of thought:
https://twitter.com/Anupam_btc/status/1442471958474473479.

¹⁶⁵ Yeung K, ‘Regulation by Blockchain: The Emerging Battle for Supremacy between the Code of Law and Code as Law’ (2019) 82 The Modern Law Review 207.

¹⁶⁶ Sotheby’s, ‘NFTs: Redefining Digital Ownership and Scarcity’ Sotheby’s Blog (April 20, 2021),
<https://www.sothebys.com/en/articles/nfts-redefining-digital-ownership-and-scarcity>.

¹⁶⁷ Linford J, ‘Copyright and Attention Scarcity’ (2020) 42 Cardozo Law Review 143, at 146.

¹⁶⁸ Ibid.

access to free versions of it.¹⁶⁹ The increasing capability of producing perfect copies of a work has been at the heart of the copyright battles of recent years, where the growing digitisation of works have eroded the possible scarcity value of copyright.¹⁷⁰

But this is only a look at scarcity as an element of the economic justification. If we look at copyright as potential incentive to generate works, or even as a vehicle to encourage the dissemination of works, then the loss of scarcity is less serious, and can explain the rise of copyleft-like licensing models that encourage the creation of a cultural commons.¹⁷¹

But even if we maintain the usefulness of copyright as means of maintaining an artificial scarcity, can NFTs help in propping up this justification for the existence of copyright? Not exactly, the problem is that in many ways the scarcity in NFTs is illusory, as opposed to the regulated artificial scarcity generated by copyright. As it has been covered throughout the article, the scarcity represented by an NFT is illusory because the NFT does not act as a barrier to access and copy the work, it acts as a signed receipt that the holder can display. The work itself is available to everyone else for the most part, so the scarcity is for the unique token itself, and even that can be copied.¹⁷² So if copyright generates artificial scarcity, NFTs generate no scarcity whatsoever, and on the contrary, it could be used to open works into the public domain in a form of patronage.¹⁷³

Moreover, NFTs appear to be in direct conflict with copyright when we look at them from the perspective of fungibility; for the most part, copyright works are intended for the most part to be fungible, what is often called in copyright theory as non-rivalrousness.¹⁷⁴ The basic formulation of this concept often goes like this: If I have a pie, I can eat the pie, and you can't eat it. If I have a song in any format, my enjoyment of the song does not detract your own use and enjoyment of the song in any other way. The works are non-rivalrous, and for all purposes, fungible, it does not matter which copy of the song you are listening to, they're interchangeable.

However, there is also a non-fungible element to copyright works. In principle, some copyright works start life as a unique item, let's say the first manuscript of a book typed by an author, or written in paper by hand; the original music written by the composer; or an original sketch by a famous artist. These can be copied and published, hence the

¹⁶⁹ See: Ku R, 'The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology' (2002) 69:1 University of Chicago Law Review 7.

¹⁷⁰ See amongst others: Lehdonvirta V and Virtanen P, 'A New Frontier in Digital Content Policy: Case Studies in the Regulation of Virtual Goods and Artificial Scarcity' (2010) 2 Policy & Internet 7; and Bodó B, 'Libraries in the Post-Scarcity Era', In Porsdam H, Copyrighting Creativity (Routledge 2015).

¹⁷¹ See: O'Sullivan M, 'Creative Commons and Contemporary Copyright: A Fitting Shoe or "a Load of Old Cobblers"'? (2008) First Monday, <https://journals.uic.edu/ojs/index.php/fm/article/view/2087>.

¹⁷² Take the service called "Knock-Off NFTs", which allows users to generate a blockchain token of an existing NFT. See: <https://www.knockoff.lol/>. I was able to generate a token of the famous Nyan Cat NFT using this service, see: <https://bit.ly/39Z7z4s>.

¹⁷³ See for example this photograph which has been released to the public after an NFT purchase: <https://www.freehawaiiphoto.com/>.

¹⁷⁴ An idea better elaborated here: Coombe RJ, Schnoor S and Ahmed M, 'Bearing Cultural Distinction: Informational Capitalism and New Expectations for Intellectual Property' (2006) 40 U.C. Davis Law Review 891 at 893; see also: Gordon WJ, 'Intellectual Property', in Cane P and Tushnet M (eds), *The Oxford Handbook of Legal Studies* (Oxford: Oxford University Press 2003) 617, at 621.

very nature of the existence of copyright protection, but these originals could have economic value on their own right as non-fungible items. Artists also create unique works of art all the time, let's say a painting, a sculpture, a drawing, a photograph. These original items have value in their own as non-fungible items, but copyright is the exclusive rights on subsequent uses of their work, so a photographer can allow a photograph to be copied and published. A painter can make copies of their work, even if the non-fungible version is held in a museum.

There can also be an interaction between fungible and non-fungible elements in art: some artists create limited editions of their own work in the shape of limited-edition lithographs, or in the shape of numbered editions.

From a copyright perspective, NFTs are no different. For the most part an NFT does not confer a title of ownership on an original work, it is just a cryptographically signed receipt that you own a unique version of a work. So NFTs are less relevant from a copyright perspective, not only because of the reasons explored in previous sections, but also because they are just metadata of the work. While the idea behind the NFT is one of scarcity, it is only an illusory scarcity, nothing stops the creator of a digital asset that is turned into an NFT to create more copies of the work and sell these "unique" versions to the highest bidder. True, this would in principle dilute the value of the NFT, but the market is so full of different platforms, it may be possible to post different tokens of the same work in various platforms. There is nothing in the technical infrastructure of the Ethereum smart contract that stops the creation of more "unique" versions of the same resource.

In many ways, this is similar to what is going on with the limited edition lithograph market, where some artists have been accused of re-issuing a work that had been sold before as a limited edition. This was already litigated in the US,¹⁷⁵ where a photographer re-issued a limited print edition in a different size, and got sued because it was decreasing the value of the sold copies. The photographer won, and the judge decided that "although both the Limited Edition works and the Subsequent Edition works were produced from the same images, they are markedly different". One can see a similar decision in this instance, where there is no indication that an NFT will be in any way unique, or not subject to future re-issues.

5. Conclusion

There is clearly going to be some practical interaction between NFTs and copyright, although most disputes will be handled at the platform level. As the gatekeepers of the space, marketplaces are already acting as a filter that removes possible infringement, encouraging the existence of a space where creators can offer tokens they have generated. Nonetheless, the nature of the market, and the incentive of large returns, will still mean that the NFT space may generate a lot of copyright disputes.

The most relevant analysis for the future will be whether the minting of a work infringes copyright in any way. As it has been discussed in the previous pages, there does not appear to be a direct relationship between the NFT and the work that was used to create it, so at least from the perspective of the UK jurisdictions, we could make a strong argument that the act of minting an NFT, even without authorisation, will in any

¹⁷⁵ Sobel v. Eggleston, No. 12-cv-02551 (S.D.N.Y. 2013).

way infringe copyright. Closer inspection will have to be taken with regards to communication to the public by means of a link contained in a token. It is the argument presented in this article that while most NFTs contain a link to a work, this link could be obscured, particularly if the smart contract has not been made available.

As the NFT hype continues unabated, it is likely that we will encounter more examples of possible copyright infringement. It will be important to look at the type of NFT that is being shared, and whether it contains a link to a digital copy.

One of the best possible uses for NFTs will be in some form of rights management, particularly the collection of royalties. The automated nature of the smart contracts will lend itself to this function, so perhaps once the hype abates, more practical uses will emerge. There may be a problem in trying to generate scarcity when copyright works better with non-scarcity. The more popular a work is, the better. More education for artists is still required, and the level of misinformation and misunderstanding of NFTs is staggering.

There are still many questions open with regards to NFTs and copyright. The present article has not dealt with the question of moral rights, which present a very interesting interface that should be studied in the future. There is also a growing interface between NFTs and artificial intelligence works. Similarly, there should be further exploration of NFTs and copyright theory, as we have only started to scratch at the surface of a vast topic.