

An Essay on Blockchain

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This essay aims to explain what Blockchain is and how it is used commercially. To also be explained is the legal implications of Blockchain on the music industry and how creatives can utilise Blockchain and intellectual property law to monetise and protect work. It is becoming essential for musicians to learn more about NFTs and generate extra revenue to fund their new musical creations in a new age of digital media.

1. What is Blockchain and how does it work?

Blockchain is a type of database – a collection of data stored by electronic means on a computer system (Conway, 2020), first made popular as the technology behind the cryptocurrency Bitcoin. Another way to look at Blockchain is as a distributed ledger, generally managed in a decentralised way (Cong and He, 2019), meaning that no one organisation can own the chain (Built In, 2019).

Blockchain and a typical database's main difference is that a database structures its data into tables, and Blockchain structures its data into blocks that are all chained together. This system makes an unalterable timeline of data when employed in a decentralised manner. When a block is filled with data, it cannot be changed and is given a timestamp when added to the chain (Conway, 2020). Each block in the chain contains numerous amounts of transactions, basically making each block a digital ledger. This ledger is copied and spread across the network of computer systems on the Blockchain (Euromoney Learning, 2020b).

Each transaction is recorded with an unalterable cryptographic signature called a hash (Euromoney Learning, 2020b). Once a transaction is verified, it needs to be added to a block. Before it can be added, it is first run through a hash algorithm, which converts it into a series of unique letters and numbers. After this, two transaction hashes are combined and put through the hash algorithm to create another unique hash. Multiple transactions are combined several times until only one hash remains, known as the 'root' hash of multiple transactions. This helps keep data secure, as it is impossible to reverse the process to decipher the original data (Euromoney Learning, 2020a).

Because of these hashes, if one block in one chain is altered, it would instantaneously be evident that it has been tampered with because all chains are open for everyone to see. If a hacker wanted to hack a Blockchain system, they would need to change each block in the chain. This includes all versions of that chain that has been duplicated and sent to other computers in the network. The more blocks there are, the better security there is. This means that a popular Blockchain such as Bitcoin would be nearly impossible to hack into without detection (Euromoney Learning, 2020b).

There are three essential components to each block in a Blockchain. The first component is the data in the block. Secondly is a 32-bit whole number, referred to as a nonce. The nonce is generated at random whenever a block is created, thus creating a block header hash. Lastly is the hash, which is a 256-bit number that is connected to the nonce, starting with a large number of zeroes. When the first block of a chain is created, the cryptographic hash is generated by the nonce, meaning the data block is considered signed and forever tied to the nonce and hash unless mined by a miner (Built In, 2019).

Miners create new blocks on the Blockchain by using a particular software program to find a nonce that creates an accepted hash. Because the nonce is 32-bit and the hash is 256, this means there are around four billion possible nonce-hash combinations that need to be mined

through before finding the right one, which is why such software is needed. When that “golden nonce”, as miners call it, is found, the new block that has been mined is added to the chain and miners are paid (Built In, 2019). This helps to strengthen the security of the chain, making it harder for hackers to alter.

2. The commercial uses of Blockchain

Blockchain technology has expanded its uses from just cryptocurrencies to commercial uses across various industries, other than just finance (Notheisen, Cholewa and Shanmugam, 2017), meaning that today Blockchain has many uses. Blockchain has been expected to significantly change the modern finance industry, optimising global financial infrastructure more effectively than the current financial system. Financial organisations can cut out the middlemen by using Blockchain’s security, immutability, and transparency (Chang *et al.*, 2020).

VTB Capital, a Russian investment bank, said in 2018, they have no intention of pursuing Blockchain technology. Because it was relatively expensive and energy-intensive, VTB Capital could not see any commercial uses for the technology as its excitement was dying down. Although they admitted they might regret it in the future (McLellan, 2018), how could they have known that Blockchain would grow in popularity amid a global pandemic?

Among all industries, one particular sector can gain tremendously from the transparency and traceability that Blockchain offers – the entertainment industry. Since this is a relationship-based industry between music and content creators and their fans, creatives can benefit by cutting out the middlemen who usually take a somewhat large chunk of money. A challenging task for independent artists nowadays is funding (Koffman, 2020). It can be tough to fund a decent album or even write a good song, as working long hours to get the money to record anything could take good songwriting time away from musicians. Streaming services have already helped a little bit by allowing musicians to upload content without a label (Koffman, 2020), although the payments are not nearly enough to live off. An example of how Blockchain helps is the mobile app Vezt, which allows fans to buy shares in their favourite songs' recording rights. This then provides artists, songwriters and producers with financing obtained directly from their fanbase. Vezt uses Blockchain technology to track royalties from songs and collect said royalties on behalf of fans through performing rights organisations (Vezt, 2021). It does sound like a good alternative, as fans could take pride in owning a percentage of a song's royalties that they helped to achieve (Koffman, 2020). However, some fans have taken to Reddit to express how they are unhappy with the app's services, stating that the app creators do not respond to queries and others stating that the payouts take too long (Invest In Your Playlist, 2021).

Another company utilising Blockchain technology is Verifi, a company whose primary intention is to synchronise rights across stakeholders in songs, including the artists, labels, and streaming services (Koffman, 2020). Verifi bundles audio files with the ownership metadata files, so it is clear who owns a song's rights (Verifi Media, 2019a). In more detail, What Verifi does for creators is bundle all the information about the song and who should be paid with the file itself, which is then placed into a permanent storage compartment called a block. By doing this, the information cannot be erased, meaning each change to the data gets stored into a new block, therefore creating a Blockchain. After this is done, a unique URL is

generated, and Verifi watermark said URL into the audio file before delivering the file to platforms (Verifi Media, 2019b).

3. Legal implications of Blockchain

The law within Blockchain is called *lex cryptographia*, which is an emerging subset of law. It can change how lawmakers, regulators, individuals, and society thinks about the law in general. The power to eliminate uncertainty and narrow down the law to technical codes may impact its application. It could make legal interpretation and prosecution for laws relating to online transactions progressively more unneeded (Dimitropoulos, 2020). Professor Lawrence Lessig has explained how code can also operate as law. Code is the human-made design of cyberspace, which means it is in a great position to monitor individuals actions when using technology. Blockchain technology is an example of “code as law”, as it tends to rely on code more than the law to regulate personal actions and transactions. As a result of this, lawyers and legislators may be convinced to draft legal or contractual rules into code, thus leading to “law progressively turning into code” (Dimitropoulos, 2020).

One legal aspect to look at regarding Blockchain technology is smart contracts, which manages trades done online. There are two ways that parties can react when deciding to manage their financial exchanges via a smart contract. The first way is to let all of the programmable logic and code within the smart contract represent the terms and conditions agreed upon. There is a problem with this method, though, which is that the other party may not know how to read the code and thus misinterpret what it entails. The second method could be for both parties to share a document externally with all the legal terms and conditions that will bind the parties and indicate how the smart contract will work. This means that it would be necessary to ensure that the terms stated in the documents are the same as the smart contract code. As long as there is trust between both parties, it should not matter what the smart contract code says (Ryan, 2017). When a smart contract is used in the exchange between two parties, both parties' commitments are affected simultaneously and subject to the agreed terms coded. This means that particular inconvenient actions that can happen offline, such as hold up, cannot occur as smart contracts make it hard for either of the parties to cause a postponement in delivery or payment. Hold up is when one party threatens the other with economic damage unless they grant a discount of some sort to the opposing party (Ryan, 2017). This means that using smart contracts is less likely to cause issues that could disrupt the transaction being made or upset either of the parties, decreasing the chances of a legally binding contract of payment being broken.

There are downsides to smart contracts, though, for example, say there is a tenant whom their landlord trusts that cannot pay their rent for a month due to not working because they have been self-isolating due to COVID-19. The landlord could usually make a decision such as letting them pay the rent at a later date or increasing their next few months slightly to cover the cost, or they could let them off entirely depending on their relationship. A smart contract could not offer the parties any of these options (Zou, 2020), as even though many were aware of the growing cases of COVID-19 in China towards the start, not many expected it to grow how it did. This implies that, overall, code could not replace law unless it could somehow consider real-world events in the code. Instead, the law could be used as insurance to solve any implications that the parties have faced after the smart contract has been fully executed (Zou, 2020).

4. Monetising and protecting intellectual property through Blockchain

In Europe, if someone declares to be the owner of a trademark, they should use a title approved by the European Union Intellectual Property Office. Blockchain technology does not change this requirement; instead, it could be utilised by IP offices to register and grant IP rights. Using Blockchain technology instead of the current databases used, one could access records more quickly and reduce record-keeping costs, all in a more secure environment. Some would say Blockchain technology could be used to establish proof of use in trade before or after a trademark has been registered (Maurice-Vignal, 2020).

One of the most prominent issues in the entertainment industry is the ownership and management rights over content. Attempting to track down the rights for all the pieces used in producing songs and videos has created many lawsuits and arguments over royalty payments. By using Blockchain technology, intellectual property rights can be tracked correctly. All information on a Blockchain is publicly available, which means that digital rights companies can read the entire record of transactions made (Koffman, 2020). Blockchain can be great for artists and help fund new musical ventures because of two main reasons. The first reason is Blockchain's ability to lower transaction costs and enable micropayments, which leads to the possibility for ongoing payments from music streaming to be far more effective. The second reason is that Blockchain can open many new financial gateways for artists to generate revenue. One example is token sales (O'Dair and Owen, 2019). Token sales from entrepreneurs to grow capital are sometimes called initial coin offerings (ICO) and seen as crowdfunding (Tönnissen, Beinke and Teuteberg, 2020).

A token or cryptocurrency is a process where an asset is created on the Blockchain. In the music industry, the asset is typically digital music or artwork. When an artist creates a token, they are turning their intellectual property into a financial asset. By buying into a token, the buyer can then share the artist's work, and revenue flows (Cotton, 2018). However, this is only likely to work for more successful artists with larger fanbases (O'Dair and Owen, 2019). The more people who consume the artist's product, the greater the value of the token. Artists can also allow their fans to exchange their tokens for bonuses, such as exclusive access to live events or early access to new content. This creates a new way for fans to experience their favourite artist's creativity (Cotton, 2018). An example of this can be seen in Kings Of Leon, who recently made around \$2 million selling non-fungible tokens (NFTs) bundled in with their new album (Ingham, 2021). Those who purchased said NFT receive a limited-edition physical copy of the Golden Eye vinyl featuring the band's album 'When You See Yourself' (YellowHeartFactories, 2021).

A non-fungible token is essentially unique and irreplaceable. For example, a bitcoin is fungible, meaning it can be traded for another bitcoin. However, NFTs are one of a kind, so the owner would have something entirely different if they traded it. NFTs can be anything digital and seen by some as a form of collecting art, which makes some rather pricey, such as purchasing a 50-second video by Grimes for \$390,000. NFTs use Blockchain technology to verify and appoint an official copy of digital media that allows artists to commercialise digital collectables (Stassen, 2021). Although these images and videos that people spend thousands on can be saved and downloaded by anyone, purchasing them gives the buyer ownership of the art. The artist still retains the copyright and reproduction rights (Clark, 2021), which makes it a good way for artists to monetise their intellectual property by making their art an

NFT. However, some would argue the purchase to be pointless, as, with digital art, a copy can be just as good as the original (Clark, 2021).

Overall, NFTs seem to be a growing way for musicians to generate more revenue with their intellectual property. By the end of February 2021, NFTs had reportedly generated over \$100 million in sales in the month across many entertainment formats. NFTs have also started to impact the music industry, with at least \$25 million of revenue generated between February and early March (Stassen, 2021).

5. Conclusion

Blockchain technology has recently proven that it can be pretty beneficial for artists to generate higher revenue and compensate for not performing live due to the COVID-19 pandemic. It is not certain whether NFTs and digital art will still be a means for creatives to generate revenue as lockdown restrictions start to be lifted. However, with the amounts of money that some art collectors have already spent on them, one could think it would not die out easily. Perhaps more artists will sell percentages of their royalties in the future to fund new creative ventures, and maybe even record labels will start to follow suit.

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