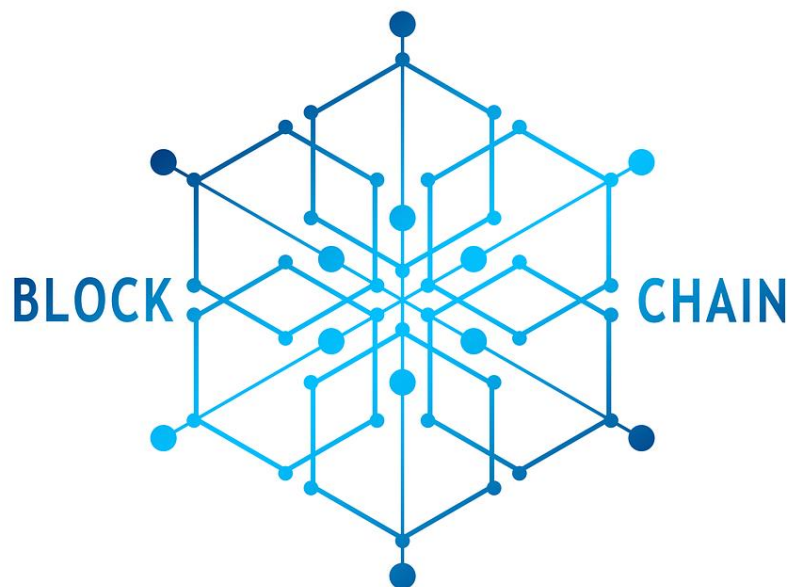


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Explain the definition, commercial uses and legal implications of Blockchain on the music and entertainment industries.



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1. Introduction

The music industry has experienced many significant changes in recent years that are directly linked to the birth and growth of the internet. The internet has given the music industry many new, exciting opportunities. After a difficult period of continuing losses for the industry, streaming has brought it back to life. Connecting people from across the globe utilising online platforms to stream music and entertainment on sites such as YouTube and Spotify, has plunged the music industry into a constantly evolving complex market. The technology enhancements and online capabilities don't help to simplify the situation for the industry either. Blockchain was introduced in the late 2010s, so at these early stages when blockchain isn't widely used in the music industry, it is hard to definitively identify the direct damage/benefits that the system has on the music/entertainment markets. There is much excitement and many bold claims surrounding the potential of blockchain, it is important not to rush into relying on systems without understanding how it is likely to take hold (Iansiti and Lakhani, 2017, p.4). However, there has been extensive research into blockchain methods, and many opinions have been formed through observing blockchain's effects and implications on various other industries such as finance and notary public. This paper looks at what blockchain is, how it is used and the legal considerations whilst relating to the music and entertainment industries.

2. Definition

Blockchain technology is an online database that is an innovative alternative to the most common variety of databases that use a central administrator. Blockchain's primary function is as a distributed online ledger that can safely keep track of digital transactions (De Leon and Gupta, 2017, p.15). Crosby et al, (2016, p.9) identified the most significant applications of blockchain; validate entries, safeguard entries, and preserve historic record.

The system is described as a chain due to its chronologically evolving replicated databases, small blocks of data are added to the chain whenever a transaction occurs. Newer blocks are added onto to older blocks on the chain, and from there you have perfectly matched data blocks forming a chain of all transactions up to now, in a linear format. Each of these blocks that contain information must be linked to others using its unique connecting code, called a hash. Each block also has the hash code of the previous block to ensure chronological accuracy. Blockchain is a foundational technology that has the potential to create new foundations for our economic and social systems (Iansiti and Lakhani, 2017). Some claim this could render intermediaries such as brokers or bankers obsolete.

One of blockchain's most desirable attributes is that the embedded digital code is well protected from hacking/editing. This is due to each transaction creating a digital time and location stamp that can be easily identified if needed to at a later date. Every process and payment must be validated by each party before the block is added to the chain, this brings a new level of connection, communication and trust for internet users. The security of blockchain is much more effective than a classic centralised network. The unique hash code and structure of the blockchain system operate in a decentralised network, which means that each node can access the information in the database. In the event of a cyber-attack, a centralised network means that the hackers need only focus on the 'master' hub or node to access the entire network. Blockchain however requires each hash code to

match on the chain, and since any modification or addition will change the code entirely, hackers must recalculate each hash code that is on the chain. This would take a vast amount of computing power, which helps to deter potential perpetrators. However, large hacks have occurred in the network and will be looked into in more detail in the next chapter.

3. Commercial Uses

Blockchain has developed from version 1.0 to 3.0. The first version focuses on virtual currency (cryptocurrency), second version isolates technology and protocol applications as to contracts, the third and current version is the expansion into markets beyond finance (Fulmer, 2019, p. 172).

Blockchain technology is being applied in many various markets which have originally relied on third party entities to validate and safeguard the transfer of online assets. Zhiming Zheng wrote in the National Science Review 2019, that 'Blockchain can be applied to a certain application scenario provided the scenario has one of the following six properties: it needs multiparty interaction; it needs creditability; it needs disintermediation; it needs atomicity; it needs privacy; or its production relations need essential adjustment. (Zhao, 2018)

There are many various opportunities for blockchain to expand in existing, or to be introduced, into multiple industries such as; Cryptocurrency, Banking, Supply chain, Healthcare, Voting, Property records and many more. The financial services are the most well-established companies known for using blockchain technology, especially including the dramatic events of Bitcoin over the last few years. Blockchain has also already been put to use in verifying authenticity in Notary Public sectors. Using these two established examples, there is sufficient evidence and literature to identify the benefits and restrictions that blockchain may have on the music industry.

3.1 Bitcoin

Bitcoin was first noticed in a paper published by 'Satoshi Nakamoto' in 2008, which identified a peer-to-peer alternative to standard electronic cash. The paper claimed online digital asset transactions can be direct from one party to the other, without the need for a third party or financial organisation. This alternative to electronic cash is known as 'cryptocurrencies'. Bitcoin grew extremely quickly and was the first successful example of the popularisation of blockchain technology. Bitcoin's market capitalisation is currently at \$157 billion (as of 16th January 2020), and makes up more than half of the cryptocurrency market value (<https://coinmarketcap.com/>).

Bitcoin is a good reference case when analysing the security of blockchain networks. In 2013, Mt. Gox was a leading exchange of Bitcoin and was responsible to handling 70% of distribution of the currency (Griffin and Shams, 2019). \$450 million then went missing from investors accounts due to a mysterious hack, and many people believe that it was an inside job (Nilsson, 2015). These highlight important issues in a non-centralised blockchain network where trust is a problem. Blockchain networks such as Bitcoin are public, members are also anonymous which can comprise the whole network. This being said, the popularity of Bitcoin has continuously grown, further reinforcing the intent of blockchain networks to be utilised in multiple industries.

3.2 Notary Public

A public notary is someone who is required by law to serve the public in non-contentious matters. Many tasks that are undertaken by lawyers can be done using blockchain methods, especially for cases dependent on the long-distance transfer of forms, such as overseas property sales, overseas adoption and overseas examination applications. Blockchain can cut out the need for power of

attorney measures. The document certification services blockchain practises provide; Proof of Ownership, Proof of existence and Proof of Integrity. (Crosby et al., 2016)

Using blockchain functions in this industry reinforces the security and privacy of sensitive documents transferred online. Other important benefits of using this system is to cut out notarisation fees, and it reduces time waiting for validation and approval.

3.3 Music Industry

As previously mentioned, the music industry has undergone significant changes in recent years due to the growth and capabilities of the internet. The most notable development being streaming. As records, IP content and royalties all moved online, the process for collecting and distribution became very complicated with assets passing through multiple third parties before reaching its end point. This is where blockchain could have an extremely beneficial impact for the music industry. Identifying the original copyright holder and easing the task of tracking derivative works are the most significant possible benefits of the blockchain system. However, there are other areas of the industry that blockchain could also assist in, such as; Flexible pricing and revenue optimisation, fast payments, superior valuation, transparency and negotiating power, piracy, sharing revenue and innovative business models.

3.3.1 Intellectual Property

Intellectual Property (IP), refers to the copyright information about a song/album. There are usually at least two types, the sound recording, and song writing. The complexity of the rights involved in the online transfer and distribution of a song recording of a performance of a protected musical work is enhanced by the various rights holders involved (performers, producers, publishers and songwriters) (Lyons et al., 2019, p.31).

Blockchain could be prove an effective solution to these issues. Storing all useful information on the network regarding royalty splits and rights ownership could provide a more comprehensive and accurate database (Crosby et al., 2016). Another way to improve IP protection with blockchain could be to emded each song with metadata that includes information on the copyright holders and terms of use. This could ease the process of copyright clearing and could persuade copyright infringers to go through legal channels due to its simplicity.

Whilst there may be perceived benefits of blockchain for IP protection, there are also concerns that it could be the death knell of copyrights (Vogel, 2015). This is due to nature of a decentralised network; it would be incredibly difficult to pin liability of infringement once a pirated version of a song is uploaded to a block. Even though decentralised networks generally eliminate common failure of a central control point, online storage-based solutions still usually face challenges relating to data control, privacy and security. Many people are not willing to trust third parties with confidential and sensitive information (Crosby et al., 2016).

3.3.2 Online Transactions

Royalty payments are currently very slow to be paid to the copyright owners, taking many months and sometimes years. Artists in particular feel the full effect of this slow process as they are paid last in the revenue chain. Therefore, this system is already in dire need of a refit and blockchain could be an effective solution. Firstly, cryptocurrencies have minimal transaction costs and can usually make micropayments to eight decimal places (O'Dair et al., 2016, p.10).

This could potentially enable copyright owners to be paid instantaneously from the streaming platform as a song is being streamed for example. Another benefit of this system would be that the intermediaries taking a share of the royalties could eventually become redundant. Whilst the speed

of payment may not seem significant, independent artists who do not receive sizeable advances will experience an immediate benefit of the blockchain fast payment system.

3.3.3 Revenue Share

There is what is often described as a lack of transparency in the value chain in the music industry. Funds are frequently distributed to the wrong party and some are never even paid at all. Large amounts of royalty revenue also end up in the so-called 'Black Box', where unclaimed royalties lie due to a lack of sufficient copyright owner identification system (O'Dair et al., 2016, p.4).

Bitcoin is a good example of a system that provides a solution to the issue of exchanging information over an unreliable, untrustworthy network. It operated a Proof of Work process that verified all contributing parties after a series of tests, which then achieved consensus without the need for a central authority. This could eliminate the need for the 'Black Box' as copyright owners can be easily identified and verified on the network.

4. Constraints and Considerations

Blockchain technology still has many unresolved issues that could significantly hinder progress and existing processes. There are many problems that would need addressing in this early stage, however the issue with cryptocurrencies and government are the most notable challenges.

4.1 Cryptocurrency Issues

The most successful cryptocurrency is Bitcoin, however there are also a large number of alternatives such as Ethereum, MUSE and Evedo. Many platforms that use blockchain technology already require you to pay in cryptocurrency, which is limiting the volume of users. Another issue with cryptocurrency is the automatic association to the dark web, and although the association is reducing (O'Dair et al., 2016, p.17), private keys (complex numbered code required to transfer cryptocurrencies) exist which even further limits accessibility to the public.

Cryptocurrencies also have experienced various crashes, most recently the 'Great crypto crash' in 2018. The price of Bitcoin fell around 65% between January and February 2018, which then produced a knock-on effect with other cryptocurrencies. Before the music industry and artists put their reliance on blockchain technology and cryptocurrencies, sufficient financial checks must be conducted to ensure insurance options if a similar event were to occur.

4.2 Legal Issues

Existing governance setting may become an obstacle to innovation (Crosby et al., 2016). However, this is something that has been experienced in recent years with rapid growth of technology and social media. The process of amending or creating regulations is a long and complex one. As previously mentioned, the issues with piracy and IP infringements are severe, so much so that it would be wise to prolong any blockchain implementation into the music industry, until sufficient laws have been entrenched to ensure that piracy will not plague the industry once again.

Another legal would be how to enforce blockchain contracts 'smart contracts' which occur automatically when a transfer is made. These smart contracts operate away from any regulatory body, this could cause issues if disputes were to arise. Which, if any, laws could apply to protect your assets? How can you get compensation? Who is liable? This being said, it would be assumed that lawmakers would recognise the risks and implement necessary laws should it be required.

The General Data Protection Regulation 2018(GDPR) is a directive brought by the European Parliament. The European Parliament a year later published a study, 'Blockchain and the GDPR – Can distributed ledgers be squared with European data protection law'. McMahon (2019), condensed the study into two main reasons why blockchain and GDPR have a strained relationship. Firstly, GDPR requires a centralised controller, where EU data protection laws can be enforced against. Due to Blockchain operating a decentralised network, accountability and responsibility would be difficult to allocate. Secondly, GDPR is generally about user's right to have their data erased from online platforms. This would mean potentially editing blocks of data that contain personal information, which is a direct contradiction to blockchain principles. There are however innovative techniques that could assist to remove blocks of unwanted data. An option would be to store personal information 'off chain' which could then be linked back to the ledger by a hash (McMahon, 2019).

5. Conclusion'

Blockchain technology has the subject of considerable debate and speculation over recent years, not least how the system could potentially benefit or negatively impact various markets. While there is evidence that blockchain has been successful in financial markets with innovations such as Bitcoin, major fundamental flaws have exposed weaknesses and issues with the network. As researched in this paper, the impact blockchain may have on the music industry is speculative. However, there are many issues that blockchain could truly help to alleviate. Most notably the transfer of IP and Royalty payments, both of these processes are complex and need updating. The notion that blockchain could rid the need for intermediaries in the music industry may be exaggerated at this stage, however blockchain is still in its infancy and innovative techniques to combat existing issues will surely be explored in following years. The real excitement for blockchain technology in the music industry should be focused on its potential, and its abilities to create new opportunities. Internet laws/regulations, public attitudes and piracy worries are issues that are too significant to rely on blockchain technology to safely transfer/store sensitive information or assets. Silver (2016), predicts that the adoption of blockchain by the mainstream markets might take 10 or 15 years. Therefore, the sooner we debate and attempt to develop blockchain technology, the better.

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