



Exploring Blockchain for Secure Music Royalty Distribution

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Abstract

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<p>The thesis focuses on how blockchain technology can increase transparency and security of payments to artists and musician. The thesis shows reasons why other approaches should be considered when it comes to royalty distribution and demonstrates how the system functions, what advantages or disadvantages it has in comparison to procedures that were made before. With this research I hope to give answers to questions like "How exactly does blockchain work in royalty distribution?" and "Is this approach as secure as it seems?" and "What are its advantages?".</p> <p>The thesis is written for record labels considering a transition to blockchain-based royalty distribution, but not so sure yet if it's time for them to make a change; for smaller streaming platforms to digest simple steps of how it can be implemented; for artists themselves to understand how exactly they get credited and paid for their work.</p>
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1 Introduction

1.1 Background

Throughout the history of artists, singers, sound producers are craving fair compensation for their hard work, approaches that have been in use differ from each other. When the era of streaming platforms took over the standard market, people involved started to wonder what implications they might face. Especially with the era of digitalization and rapid technology evolution, it is important to investigate the process before actually applying it.

There have been too many instances when collective work led to unfair distribution of royalties, late payments or no credentials assigned at all. Consequently, it led to people going through debilitating trials, not being paid enough for the job done, feeling devastated due to mistreatment and questioning the vile system of music business artists all over the world finding themselves ending up caught in. This generates mistrust in bigger music labels credibility, and simply waves drive and passion from musicians when they realize that making music is suddenly far from being the only thing they have to do to get paid.

It's been a long discussion among artists – especially those that are signed to a record label – how exactly they are even get paid. There are different variations of contracts depending on one's position. It can be some singer that only works on recording back vocals that gets paid hourly, or a big band guitarist that get a lump sum every once in a while. Getting paid is obviously better than not being paid at all, however it happens very often that it is hard to tract how exactly the money is distributed among everyone involved in the work process. There are many ways an artist can get income: album musical copies, merchandising, live performances, sponsorships. Fans and just music lovers can do many things to support their idols – from purchasing a signed coaster to getting a VIP ticket for their stadium tour. They spend money to show their love and devotion to those musicians, meanwhile those musicians themselves sometimes have no clue how much of those payment they will receive. Altogether it is burdensome to calculate and further divide correctly, neither it's transparent or secure.

However, there is another way for musicians to get paid when it comes to their creations. Digitalization of the music industry is the latest innovation that artists have to adapt to. The norm previously was that a person goes to the store and gets an album CD and pays one time and has unlimited access to those particular tracks on a record. A user nowadays gets a subscription on a streaming platform and gets access to all music available in the library of that service and can listen to all of it as long as the subscription is valid. If before people would pay for a certain release of a certain singer/band, now there is a streaming platform that you pay to directly to get access to

digital copies of all the songs, even if you intend to only listen to those song from that particular album.

Blockchain is the system that would be used to transmit royalties throughout people involved in the creating process, such as writing and composing; performing; managing. It is a relatively fresh idea to use this technology in music distribution, so in this study I want to put everything that has been discovered so far together.

1.2 Objectives

The main questions of my research would be 1) How exactly blockchain system work in royalty distribution, 2) Is this approach as secure as it seems and 3) What are its advantages over traditional methods?

The thesis is written for record labels considering a transition to blockchain-based royalty distribution, but not so sure yet if it is the right time for them to make a change; for smaller streaming platforms to digest simple steps of how it can be implemented; for artists themselves to understand how exactly they get credited and paid for their work.

I need to admit that when it comes to art, music in particular, there is never a 100% working solution due to such things as illegal downloads, piracy, unapproved remixes and other matters that unfortunately have nothing to do with the way the royalty distribution works itself.

The structure of my thesis goes as follows: I will explain the main concepts, provide information found in other articles that will showcase how the blockchain system applies to music business, find proofs of it being trustworthy and secure, and then try to compare my findings on this approach to the way royalties were distributed before. There are enough published materials in my possession to investigate to satisfy this study's objectives.

2 Blockchain Technology in the Music Industry

2.1 Blockchain Definition

Blockchain is a decentralized digital ledger technology (DLT) that record transactions running across a web of computers and allows it be stored on thousands of servers. The operations are interconnected, irreversible and cannot be controlled by its users, which provides security and transparency. It is distinguished by its decentralized nature, which means there is not a single entity in control of these processes. (Betcher, 2024)

The structure of a blockchain consists of multiple blocks, each containing a set of transactions. These blocks are linked to each other in a chain through a cryptographic process. Each block contains a hash of the previous block, a timestamp, and transaction information. Modification of data is not stipulated, as changing one block would require modifying all subsequent blocks in the chain.

The primary purpose of blockchain is to provide a secure and transparent way to digitally track ownership of assets and record transactions without the need for a central authority. The advantages of using blockchain technology include enhanced security, as each transaction is encrypted and linked to the previous transaction. It also offers increased transparency, as every transaction is recorded on a ledger that is accessible for all participants.

Simplified scheme of a blockchain transaction

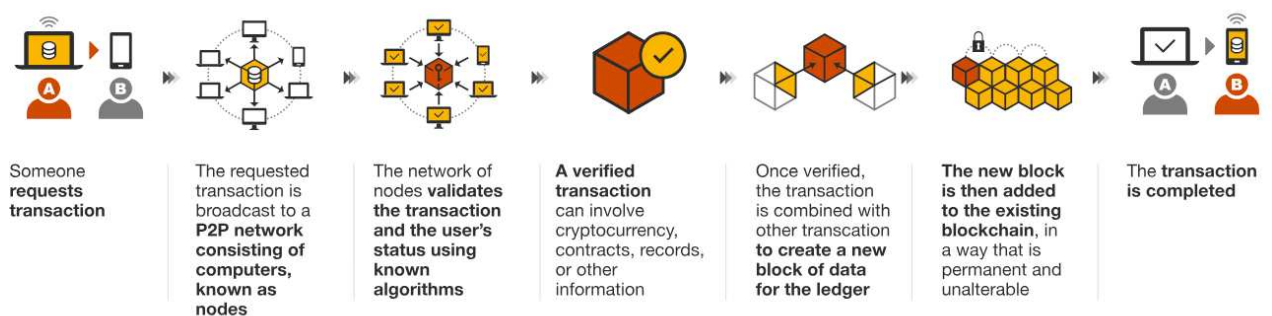


Figure 1. PWC

2.2 Music Industry

Music industry refers to businesses, organizations and individuals altogether that work on creating, producing and further marketing and distribution of musical artistry. This includes record labels that manage all those processes, venues holding concerts, services that provide copies of music and musicians themselves. Royalty distribution is a process that delegates monetary reward to artists, songwriters, producers and others involved in the system based on their ownership privileges. Those payments are mostly based on the products' sales: physical and digital copies of musical albums, streaming, merchandise, concert tickets and so on. Streaming is a technology that allows people consume audio and visual pieces of work in real-time without downloading the files.

2.3 Current royalty distribution disadvantages

There have always been flaws in the way the conventional methods of royalty distribution works. It's a complex process that involves many parties, such as stakeholders, publishers, labels, distributing platforms, and artists themselves. Each stakeholder has distinct agreements that dictate how those royalties should be divided. People in charge have to consider various costs and revenue before deciding the amount the artist shall receive. This multi-step payment process, results in musicians waiting a dubious period of time to receive their well-deserved earnings, which, depending on their echelon and lifestyle, are crucial to their life. (Hogan, 2023)

Just like in any other complex sphere, accurate royalty payments heavily depend on correct and comprehensive data, which accumulates with a strong progression. In music industry, it involves sound recordings, participation in social events, attending gigs and rehearsals, and many more. It is a challenge to accumulate an adequate data, which affects the correct outcome. Those, that proceed with their career independently and not being managed by a third party, may not have right recourses to secure their tracks and properly estimate their income. An accountancy firm CC Young & Co quotes : "This is not just data concerning where and how music is consumed. It needs to follow the money and include currently obscured details. The same skepticism and directional testing that we employ through our statutory financial audit work needs to be applied to the transparency of music royalties." (Hanley, 2023).

The phenomenon when it gets impossible to track down payment due to lack of data is called a 'black box'. By March 2022, \$424 million have been accumulated through purchases of music goods, yet never reached the actual artists that took part in song creation process. (van Teen, 2022). In the same article it is also stated that this dubious process of money distribution management costs expensively as it is, which marks this approach not just vulnerable, but also inefficient.

2.4 Blockchain technology in royalty distribution

When the initial discussion around possibilities of blockchain in the music industry began, it seemed like the goal was to completely undermine the traditional business models. Over time, however, as more people investigated this approach, the conversation became more cooperative, aiming to rather integrate blockchain into existing frameworks than demolishing them for a better cause.

(Baym, Swartz, & Alarcon, 2019).

There are also several challenges that arise when ideating blockchain adaptation in the music industry. Implementing blockchain technology requires significant funding, which stakeholders are rather skeptical to show green light to. The implementation comes with technological infrastructure and skilled programmers that must be paid upfront, which is difficult to do without support of stakeholders. Not to mention the cost of further operational processes, documentation management and legal hurdles. The authors also discuss that ubiquity of blockchain systems lead to high energy consumption, which, to monetary costs, adds environmental “costs” associated with managing large amounts of data that the music industry might require.

Tokenization is a process of converting rights or assets like intellectual property, artwork or real estate into a digital token on a blockchain. It often involves the use of smart contracts to automate the governance of these tokens.

Blockchain caters many sources and ways of use, the ones that would apply to creative industries like music are tokens and Initial Coin Offerings. ICO is a fundraising mechanism where new ventures raise capital by offering their blockchain tokens to investors. These tokens represent a stake in the project that enables stakeholders to bring their contribution. This way artists can establish greater control over their earning and the creative process, reducing dependency on record labels and third parties that often take a significant part of the revenue. (Owen & O’Dair, 2019).

In the same article, they discuss possible future outcomes of blockchain in the music industry. The ‘utopian’ scenarios imply a future where blockchain technology reduce the role of traditional intermediaries significantly, which implies direct communication between a musician and a user. If everything goes the right way, we can expect a thriving ecosystem where all parties benefit equitably.

Dystopian scenarios implies that bigger record labels might integrate blockchain technology to streamline operations, yet keep the control over the distribution and revenue structures. In the worst case they might abuse the technology to enrich their power, potentially increasing inequality where only artists of a certain status can benefit from the blockchain innovation.

3 Technical implementation

3.1 Decentralized Finance and Smart Contracts

With the rise of blockchain, a new type of intermediary emerges named infomediary. The term refers to entities that are custodians, agents and brokers of customer information, helping to connect different parts of a supply chain more effectively through blockchain technology. It aims to reduce the traditional barriers within the music industry, offering new forms on financial 'middlemen' and supporting services that can lead to more direct monetization opportunities for musicians. ICOs allow them to automate loyalty distribution and licensing through smart contracts (Owen & O'Dair, 2020).

Smart contracts are advanced algorithms rooted in blockchain technology that automatically execute, control, or document legally relevant actions in line with the agreement. According to the article, platforms like Ethereum enable the automation of royalty payments processes, ensuring that artists are paid accurately as soon as music is streamed or purchased. Smart contracts reduce the risk of mistakes and reduce time spent on handling agreements manually.

Decentralized Finance (DeFi) represents a shift from traditional centralized financial system to P2P (peer-to-peer) finance via Ethereum blockchain, which can reduce the need for currency exchanges and banking involvement (Nowiński & Kozma, 2017).

Blockchain's ability to provide transparent ledger makes it ideal for authenticating the origin and ownership of goods through the supply chain, which is very important in the industries that rely heavily on authenticity. When used, all stakeholders have access to the same information, reducing fraud, and increasing efficiency. Major stock exchanges and financial institutions are exploring blockchain for stock trading, clearing, and accelerating the processes without increased cost (Nowiński & Kozma, 2017).

3.2 Smart Propertized Digital Content

The proposed method transforms digital content into Smart Propertized Digital Content (SPDC), which can be self-encrypted and governed under specific conditions laid out in blockchain. This gives creators direct governance over how their content is distributed and monetized, which includes selling, transferring, or terminating licenses without third parties' involvement. Royalties are distributed automatically according to the terms of a smart contract (Lee, Yang, & Kim, 2021).

Hierarchical Multi-Blockchain System (HMBS) is structured to elevate both scalability and functionality by dividing responsibilities across multiple blockchain layers. This allowed each layer to specialize in different aspects of the transaction and licensing processes. Mainchain (MC) acts as the foundation of HMBS, and records the base cryptocurrency transactions. Account chain (AC) is designed specifically to manage accounts and the detailed licensing information of each SPDC and is crucial for its' validity before any content transaction or access is granted. It stores information such as ownership details, terms and status of each license. Sidechain (SC) and Dual Sidechain (dSC) handle tasks that are not directly managed by MC or AC, but they are still essential for maintaining high performance and scalability by offloading specific operations. Sidechain is typically used for processing and validating transactions that do not require the full security power of the MC. Dual Sidechain is its' advanced form that handles dual, more complex operations, that require multiple license holders. (Lee, Yang, & Kim, 2021).

By separating different operational layers, HBMS provides more focused security measures on each chain, allows higher transactional volumes, efficiency and flexibility.

3.3 Schnorr Digital Signature

Schnorr signature is a digital signature produced by the Schnorr signature algorithm. In the music royalty distribution, where multiple copyright holders might need to receive payments, this signature provides a mechanism that ensures that all parties agree to the terms of content before it is distributed. It enhances both the performance of the blockchains system and the privacy of the users. It is known for its security benefits, particularly in terms of resistance types of cryptographical attacks (Son, Kwon, Oh, & Lee, 2024).

3.4 Digital Rights Management

In the era of rapid technological progress and expansion of digital content, the application of blockchain technology in digital rights management (DRM) is possible, particularly through watermarking and cryptographic innovations. In our case, blockchain-based buyer-seller watermarking protocol involves digital fingerprints, which identify both the content providers and the purchasers. Watermarks allow precise identification of copyright violations through recovery and analysis of these fingerprints in pirated content (Frattolillo, 2024).

Integration of cryptographic techniques is pivotal in the discussion of DRM system. The same article highlights the use of privacy-homomorphic encryption within blockchain frameworks, ensuring the watermarks are securely encrypted and accessible only under authorized conditions.

BMCProtector is a blockchain application for music copyright protection, that is a combination of public blockchain technology, smart contracts, and the InterPlanetary File System (IPFS) to enhance security in management of copyright in the music industry. IPFS implementation helps with preventing unauthorized access and distribution. A notable feature of BMCProtector is an adaptation of Key Protection Center, which acts as a trusted third party. This center manages the encryption and decryption keys that are essential for accessing the music files. While BMCProtector introduces innovative approaches to music copyright protection, the security of the overall system is not fully proven (Frattolillo, 2024).

4 Methodology

When it comes to this type of study, I found it most plausible to go with qualitative type of research. It will help me to gain in-dept insight into the technological implementation and the impacts of blockchain within the music industry worldwide.

Data for this study is collected exclusively from secondary sources. Primarily those are peer-reviewed articles from academic journals that I've been investigating to understand the current research landscape and current findings in the field of royalty distribution. Reports from music industry analysts, blockchain technology firms, and financial institutions will be analyzed to gather industry-specific data and trends. I also found many case studies on blockchain-based platforms, which will be examined to have an idea of their operational models, challenges they encountered, and what their current performance is.

After all relevant data is collected, I perform its' analysis to identify core ideas, discern patterns, and understand cause-effect threads within the data. This process will include organizing data into broad categories related to blockchain applications in music royalty distribution, figuring out current themes and tendencies in its' implementation and artists' opinions, to be able to give comprehensive answers to the research questions.

Since the study mostly consists of secondary data sources, the biggest ethical concern is the proper citation and acknowledgement of copyrights to avoid plagiarism. All sources material is crucially evaluated for bias and reliability to ensure integrity and legitimacy of the research.

As I mentioned earlier, the study relies on secondary data, which, although providing a clear picture of how the technology works, may exhibit a bias toward choosing tokenization over other types of royalty distribution. It is also important to note that this technology is constantly evolving, which could lead to major changes in the blockchain protocols and make the research outdated in the near future.

5 Musicians on Blockchain Technology

5.1 Interview initiation

A group of Korean researchers conducted an interview with 16 local artists to figure their opinions on blockchain system being implemented in the K-pop industry based on their own experience working in the industry. Those artists are independent singers-songwriters and composers that manage both creative and business sides of their profession. (Park & Kim, 2024).

The artists were recruited through multi-method approach. This included personal network of the authors and an official announcement on a local online community called Mule, which is frequently used by musicians to find jobs.

The main goal was to understand artists' perspective on the potential of blockchain technology as a new revenue opportunity in the music industry and disintermediation of the existing music royalty distribution and the emerging Non-fungible Token(NFT) market (Park & Kim, 2024).

5.2 Interview Results

Artists were interested in this technology, hoping that blockchain could bring more transparent and fair distribution of royalties. The idea of selling their music directly to listeners without third parties involvement seemed like a positive outcome. Artists saw NFTs as a promising new way to generate income and engage with their audience. They also appreciated that blockchain technology could offer generally broader control over their work. (Park & Kim, 2024)

Even though they expressed their interest in this particular approach, they were not sure if that would become a panacea to all their problems. Korean music industry holds a humongous share not just locally, but also internationally. They were afraid that established dominance of music corporations would not let them progress with this technology. There were concerns that NFTs might only benefit a small group of already successful artists. As for smaller artists, with the unstable nature of crypto market, there's a risk of their earnings being jeopardized. Most of the interviewees found the technology complicated and could not easily grasp how it would be implemented and what are the chances that it will bring clarity on their own income in the future. (Park & Kim, 2024)

6 Case Studies

6.1 BitSong

BitSong is one of the music streaming platforms that has already implemented the blockchain technology. It was developed in 2018 by Angelo Recca and Iulian Anghelin. Their goal is to establish a direct strong connection between an artist and its fanbase by promoting user engagement, such as allowing fans to sponsor musicians directly and benefit from exclusive artist materials. The platform is designed to decentralize music distribution, making it accessible to smaller independent artists, that now can receive royalties immediately, which is different from the traditional approach (Centorrino, Naciti , & Rupo, 2022).

To make this happen, the platform uses smart contracts on the blockchain to automate processes of the royalty distribution. This ensures that the payments are completed transparently as soon as music is streamed or purchased. Another thing that blockchain made possible is tokenization of artists music assets, which converts songs into digital tokens, or NFTs, that represent ownership rights. In the case of BitSong, tokenization allows other people to purchase or sell royalties. Royalty payment and copyright management, that would usually require manual intervention to implement, were fully available for artists and users (Centorrino, Naciti , & Rupo, 2022).

6.2 Chew.tv

Chew.tv aimed to integrate blockchain to enhance payment process for artists. It was a British startup made in early 2016, that intended to let DJs to stream their live performances. Their goal was to redefine music streaming by directly engaging with the audience through live session. Instead of paying a subscription fee, users could pay to those performers directly, which meant to provide them a larger share of revenue. Chew.tv faced significant challenges, one of which was hacker attack that compromised its operation. The recovery was sustained by donations from their customers, which in total was £12,000, but the team could not continue with the project any longer. In September 2017, it got acquired by a social music platform BandLab, which is a digital audio workstation and has nothing to do with streaming. (Owen & O'Dair, 2019).

6.3 Resonate

Resonate is a blockchain-based music streaming platform, focusing on creating equitable payment structures for artists. This would be possible without a \$1 million seed investment awarded from

Reflection Ventures. The service pays artists with each stream progressively, rather than offering minimal amounts despite substantial streams the way traditional streaming platforms do. Resonate gives artists and fans a stake in the platform, which happens to align the interests on both sides. This approach definitely enhanced profit distribution for their users, however it didn't ease the competition with the streaming giants in the market, even though they claim to be a not-for-profit organization (Owen & O'Dair, 2019).

The issue with this platform is that besides using blockchain to distribute royalties, 30% from each transaction goes away for administrative costs. A valid question arises – don't we just replace one set of intermediaries with another by changing their roles and labeling it as infomediaries?

6.4 SingularDTV

SingularDTV offered a suite of tools to support artists' needs from production to distribution. They also provided marketing services and legal support, as well as token exchange. In this case study artists were getting payments directly from fans and investors, shifting towards a more inclusive industry model. One of the biggest releases in the platform's history was a token by a Slovenian electronic music producer Gramatik in November 2017 that raised \$2.25 million in 24 hours. (Owen & O'Dair, 2019).

At the moment their official webpage (www.singulardtv.com) is empty and only holds the company's name and a picture. It presumably has been this way since 2023. SingularDTV used to have a YouTube channel, which is now named Breaker (@breaker3969), so we can assume that at some point the company changed their name to Breaker. In the description of the channel, it says, that "Breaker empowers artists with a blockchain rights management system and peer-to-peer distribution platform" (Breaker). There is also a link to their webpage, which redirects you to a platform called Tokmax, which says "Buy Tiktok followers with instant delivery & Apple pay" in bold (Toxmax). The nature of these metamorphosis can be left for further researchers to explain.

6.5 "Tiny Human" by Imogen Heap

A British singer and songwriter Imogen Heap was one of the first people to release a song using blockchain technology. She used smart contracts through the Ethereum blockchain provided by Ujo Music for her track "Tiny Human" released on October 2, 2015. Payments are made directly to Imogen and other people that were involved in the creating process based on the contract's terms.

The process was proven to be transparent and reliable. They concluded that artists and stakeholders should educate themselves about benefits and operations of this technology to exhilarate its' integration (Owen & O'Dair ,2020).

The launch was far from being perfect. By January 2016, the total revenue of the track concluded \$133.20. Imogen held 91.2% of the rights, so ultimately the sum she received was \$121.54. The price of the song on the platform was 0.60\$, and it had been purchased 222 times (Gerard, 2017). As someone, who was named "the Nikola Tesla of pop music" by Paper magazine (Moen, 2019), these numbers are disappointing. The reasons for it could be that the innovation was not ready to be received by public. Fans faced challenges when they were trying to purchase the song, as the process was complex and user-unfriendly. They had to create Ethereum wallet, acquire Bitcoin, exchange it for Ether, and then complete the transaction, all while the webpage was uncomfortably glitchy. Ujo Music later released a statement, where they admitted a lack of sufficient preliminary research before executing the technology. (Gerard, 2017).

Imogen Heap continues to advocate for blockchain in the music industry. She is a founder of Mycelia, a platform for musicians who are looking for alternative ways of music royalty distribution. One of the main services on the platform is Creative Passport, which is a P2P verifier for music creators. In 2020, the service was in its' alpha version state and had not utilized blockchain yet (Owen & O'Dair ,2020).

7 Discussion

7.1 Advantages of Blockchain Implementation

Even though the blockchain technology has not solved all the problems it initially promised to address, it has played a significant role in convening discussion and formulating a more definite stance on its status in the music industry. The actual implementation of blockchain solutions in this case has been moderate comparing to the initial vision, however it arose more topics for discussion and investigation. It has inspired many new pilot projects to launch and is stimulating some of them to continue the influence of the industry's approach to innovation and experimenting.

BitSong case study showed that blockchain technology can significantly enhance the security, efficiency, and fairness of music distribution. With instant payment and absence of intermediators in the platforms operations, BitSong represents a succeeding replacement of traditional music industry practices. They might not be the most well-known platforms in existence, however they would be a great candidate for further collaboration with researchers to estimate next steps of the technology. Particularly, they concluded that there should be more empirical data to estimate the proposed benefits of blockchain in a long run.

Blockchain technology ensure more transparent payment operations comparing to traditional ways of handling royalty distribution. The process of tracking and calculating transactions is automated, which is the most secure option for music industry. Using blockchain significantly speeds up the distribution process and reduces the chances of human error, as it eliminates manual labour (besides setting up the actual system and writing code). With this model of royalty payments, musicians must receive payments directly, rather than from some other platform after certain amount of time and deliberate calculation. This not only simplifies the payment process, but also ensures that artists can be confident that they are getting paid fairly by having access to all the necessary information to confirm the fact of those transactions.

Ultimately, collected studies advocate for blockchain technology, praising it for its' transparency and immutability, automatic and error-free payments and reduced need for trust. They emphasise that this approach may lead to a establishing a stronger direct connection between artists and their fans through direct support and communication. Authors find it a solid alternative to established royalty distribution processes and a possible solution for musicians that are struggling with them.

7.2 Disadvantages of Blockchain Implementation

At the same time, establishing such technically complex system as blockchain from scratch is a risky procedure. It requires a remarkable number of professionals and technical equipment to implement such technology on a level that would satisfy the stakeholders' and customers' needs. Not to mention the total expenses on the implementation, as much as further maintenance, training the staff, marketing and other possible costs.

A colossal flaw of using blockchain and tokenization is that these tokens have a chance of facing devaluation. Tokens are related to cryptocurrencies, which has no moderation whatsoever in comparison to normal currencies. The value of those tokens is thoroughly correlated with its' demand. If the platform struggles to attract enough people that would be interested in obtaining those tokens, the value of it drops.

A use of smart contracts requires thorough acceptance from the industry to positively influence not just artists' experience, but also those that are in charge of the current established system. This can be challenging due to resistance from traditional industry players and the need for significant changes in business operations. Korean independent artists perceive blockchain as potentially transformative, but are not so sure about its' immediate impact, due to existing industry structures.

As it might not lead to a particularly positive outcome without collective acceptance of the technology by the industry, it might also crash if too many people start utilizing the system. As the number of transactions on a blockchain increases, it may face scalability issues, potentially leading to eliminating one of the core reasons why it was implemented at first place – quick processing time.

From a solely technical point of view, initiation of such system is an ambiguous task that takes a lot of time and research. There are concerns whether a single blockchain can handle such a big amount of transactions and smart contracts involved in the music industry, which is not just the music itself, but also all the data on those who wrote and performed it. Yes, it is possible to make expansive solutions for a broader audience, but then it is a big question whether the implementation of blockchain is particularly reasonable, as it also brings a potential risk of security vulnerabilities, possible collapse of the whole system, issues related to software and hardware malfunction.

From a legal point of view, with the existing methods of ensuring copyrights, the approach stands a chance, however it would not stop people from illegally distributing music even if there are watermarks there. For an artist, there are certain risks that something might go the wrong way, and through one irreversible nonchalant transaction they have a chance of losing all the rights they have. On this stage of researching blockchain in the industry, there is no risk management. But if we are talking about the scenario where blockchain technology is merged with the traditional way

of royalty distribution, the legal framework governing music copyrights is not fully adapted to accommodate decentralized technologies at the moment. In case of SingularDTV, the outcome is rather alarming, as they seem to shift into a scam organisation.

In general, naming blockchain in music royalty distribution an efficient tool is an overstatement. It is difficult to establish, finance and maintain. Blockchain uses a large amount of environmental resources and energy, which if implemented, would bring even more negative impact to people than positive and put a cross on its' sustainable nature.

Summarising all the findings, it is difficult to see a total merge of blockchain and traditional royalty distribution services at the moment. In some cases, the platform played by the rules of any other streaming platform like Spotify and Apple Music, hiding behind a fact that they are not intermediaries, but infomediar. There is only a niche number of artists that benefited a lot from this approach. Me, someone who has slight experience in releasing music on streaming platforms, would not take this risk personally. As a small artist, I would stand no chance in getting any more income via blockchain tokens than getting shallow payments as they are already from regular streaming services.

There are platforms like Bandcamp that provides a straightforward and efficient user experience without blockchain. The question arises whether it's reasonable to implement it at all considering its unstable implementation experience and lack of research from both technical and marketing sides. The challenges of disrupting established systems and apply innovative approaches is never easy. Pioneering, experimenting, making mistakes and learning on them should be appreciated, however it is extremely important to secure balance between technological advancements with practicality. In this case, it was more of a hit-and-run approach.

8 Conclusion

8.1 Answering research questions

The thesis has explored the potential of blockchain technology in rapidly changing nature of music industry. Throughout this research, we have seen that royalty distribution can be in fact performed with blockchain. Adaptation of blockchain technology in music royalty distribution provides a high security level and transparency. It demonstrated that it stands a chance in at least integrating with current well established music industry processes. It's a fresh and brisk idea which in some cases led to a positive outcome. It is worth researching, however its', implementation should be taken with caution, as it also might lead to an underwhelming result and satisfy every requirement of this implementation.

Blockchain technology in music royalty distribution works by automating the tracking and allocation of royalties through smart contracts. These are self-executing contracts with terms and conditions written in the code. NFTs can be used as a musical product or a right and be exchanged between musicians and consumers. In this case, the product is called Smart Propertized Digital Content, and the transactions are circulated in Hierarchical Multi-Blockchain System. An example of a complete blockchain application is BMCProtector, which also involves InterPlanetary File System for establishing copyrights and guarding access to products.

Blockchain technology is able to massively impact safety of royalty transactions due to its' decentralized approach. As the payment operations do not go through different levels of computation, like it happens with most streaming platforms and music labels, musicians can receive them directly and immediately, which helps to manage their income. Using smart contracts reduces human error in the distribution process, which sometimes occurs in a traditional approach. Blockchain is a very tough system, where each piece is codependent, which is almost impossible to alter. Each transaction is visible to all parties involved – performers, songwriters, stakeholders.

8.2 Recommendations for Further Research

The research proved to have some advantages over tradition processes of royalty distribution in a nutshell, but its' use is highly dependent on people's perception of this approach. It has a chance of becoming a useful tool in these processes in the future, but blockchain has to undergo much more research before being considered a strong replacement.

This technology is at the very early stage of its' existence. There is a need for extensive studies to track and document long-term effects of blockchain implementations in the music industry. Without this sort of research, it is difficult to attract a broader range of stakeholders, which are not ready to invest in this approach. There is also a need for more detailed economic impact studies to determine whether high-priced and difficult technology would worth it to replace established manual distribution management.

Sources

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