

The Music Industries and Blockchain Technology

Accessing blockchain technology and its potential use in the music industries

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Abstract

This thesis has its research focused on blockchain technology and the music industries. I will further access in depth what blockchain is, and how it's currently being used in the music industries. Additionally, I will question the future prospects of blockchain technology in the music industries, and its compatibility with traditional music industry copyright laws and structures. The objective is to clarify some of the confusion about blockchain and its sustainability, scalability, drivers, and barriers. I view this as important questions to answer in order for people in the music industries to better understand both what blockchain is and whether it has a place in the music industries.

The key findings from this research are that there are three different factors that implicates blockchain adaptation on an industry wide scale: 1) technical difficulties and data quality, 2) practical issues with current industry structures, and 3) geopolitical and domestic politics and regulations. Nevertheless, if we look away from the top-down perspective and look at a bottom-up perspective, the story changes. For artists, musicians, and smaller music companies, blockchain can provide great opportunities for niche streaming services, rights management and registration and audience interaction.

Keywords: blockchain technology, the music industry, cryptocurrency, copyright, rights management.

List of abbreviations

AI	Artificial intelligence
API	Application Programming Interface
CISAC	The International Confederation of Societies of Authors and Composers
CMO	Collective Management Organization
DIY	Do It Yourself
DMCA	The Digital Millennium Copyright Act
DRM	Digital Rights Management
ETH	Ethereum
EUCD	EU Copyright Directive
IFPI	The International Federation of the Phonographic Industry
ISNI	International Standard Name Identifier
ISRC	International Standard Recording Code
ISWC	International Standard Work Code
NFT	Non-Fungible Token
P2P	Peer-to-Peer
PoS	Proof of Stake
PoW	Proof of Work
PPP	Pay-Per-Play
TPS	Transactions Per Second
TWh	Terawatt-hour
UBI	Universal Basic Income
UGC	User Generated Content
UMG	Universal Music Group
WIPO	World Intellectual Property Organization
WMG	Warner Music Group

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Chapter 1

Introduction

1.1 Background

In the past years I've heard a lot about blockchain technology and cryptocurrencies form different digital outputs. Most of the time it has reached me through "To the moon" memes and "get rich fast" ads on my social media feed. That's why, for a while I thought of blockchain technology and crypto as a "get rich fast scheme". Hence, I didn't think too much of it because it was more annoying than of interest to me. However, no matter how I tried to get away from it, it would always reach my attention some way or another. At some point, I read an article about blockchain technology and its underlying characteristics. I then understood that blockchain is a piece of technology that can decentralize different type of data and store it securely and transparently on a distributed ledger. I understood that it was a relatively interesting and clever piece of technology that seemed reliable and ethical. I learned about the immutable, transparent, and efficient features that blockchain provides. I remember thinking to myself "This is too good to be true". Seemingly, from my point of view, blockchain technology could basically fix a lot of the current issues in the music industries when it comes to efficient transactions and rights management. However, I didn't completely understand the challenges and issues that followed blockchain technology. Therefore, I struggled to see why the industry didn't adapt into this technological solution. Therefore, I decided to write about blockchain technology and the music industries, because I wanted to widen both my own and the industry's knowledge about a piece of technology that seems to create confusion and misconceptions.

1.2 Motivation

Blockchain technology has been recognized as a valuable technology that can be used in various industries, included the music industries. It has seen more applications and adaptations in recent years across multiple industries. Blockchain and its features has become a more common topic for the general public, and hence, there's currently a lot of hype around it. Compared to other new technologies such as Virtual Reality (VR), Artificial Intelligence (AI), machine learning, etc. blockchain technology differ because it's an infrastructural technology and not purely a service of nature (Sarmah, 2018, p. 25). Therefore, in this thesis I will look at the characteristics and features that blockchain technology provides, how its

currently used in the music industries, and *if* it can be further implemented in the current music industry ecosystem.

1.3 Research questions

I have decided to explore blockchain technology in my master thesis. I will try to explain blockchain technology, its functions, and its use cases, as well as the issues and challenges that might be relevant. The research will address current structures in the music industries, its evolution into the digital age, royalty, and copyright systems. I will explore how blockchain technology is being implemented in the music industries, and where it could possibly have a relevance.

Hypothesis:

“Blockchain technology provides both opportunities and challenges because of its infrastructural nature. Hence, its adaptation in the music industries are limited because of the music industry’s conservative nature, politics, and regulations”.

My objectives for my master thesis research are:

- To address ‘what’ blockchain is and ‘how’ it can be further used.
- To assess the relevance of traditional music industry structures and copyright laws in adaptation of new technologies.

The research questions for this research are the following:

1. What is blockchain technology, and what relevance does it provide in the music industries?
2. What relevance does traditional music industry and copyright laws have in the case of blockchain technology usage?

Chapter 2

What is Blockchain technology?

Blockchain technology is a term that is used frequently on social media and other media outlets, and it might be a confusing and complex to grasp its technological features.

Blockchain technology can also represent and mean different things to different people.

Hence, in this chapter I will present what blockchain really is and how it works. I will look at blockchain from a historical perspective and dive into its technological characteristics, features, and tools.

2.1 What is Blockchain technology?

Blockchain technology is a digital system where you can store different types of information securely and transparently on a decentralized peer-to-peer network. This means that instead of having one centralized entity that controls the information, the information is distributed to numerous computer entities around the world that is connected to the network. Because of this blockchain makes it difficult to change and manipulate what's recorded on the blockchain (Sarmah, 2018, p. 23). Blocks on a Bitcoin blockchain, for example, are created by miners and added to the ledger in a linear and chronological order (Swan, 2015, p. 10). The potential of blockchain can change and solve many issues in a wide range of industries because in its basic form it's an asset register. The asset that is registered on the blockchain can vary from asset registry, inventory, exchanges, finance, economics, hard assets (physical objects and property), and intangible assets (health data, votes, ideas, etc.) Hence, in theory blockchain could be adopted across industries (Swan, 2015, p. 11). Therefore, blockchain technology has arguably been one of the most disruptive and revolutionary technological developments in recent history according to some scholars (Tapscott & Tapscott, 2016, p. 25). In the next parts of this chapter, I will access the history and the underlying elements of blockchain technology.

2.1.1 Historical perspective of blockchain technology

The ideas and concepts behind blockchain technology has been discussed longer than most would guess. The idea of a decentralized, secure, and distributed ledger, as well as digital cash and currencies, has been discussed by scholars for several decades (Sarmah, 2018, p. 23). The concept of a distributed ledger was discussed in a paper called "New Directions in

Cryptography” as early as in 1976. The concept of digital timestamps was introduced by Stuart Haber and Scott Stornetta in 1991 in their paper “How to time-stamp a digital document”. The researchers presented a concept that could more efficient and more safely store and timestamp important documents on a decentralized network in order to make it more difficult to change or to tamper with. However, the concept of timestamping technology that they presented was not well received and were abandoned for a while (Sarmah, 2018, p. 23-24). It wasn’t until 2008 that it was introduced once more when Satoshi Nakamoto published a paper named “Bitcoin: a peer-to-peer electronic cash system”. Nakamoto presents in his paper a technology that allows for digital transactions from one source to another source without the need of third parties (Wikström, 2020, p. 112). The technology also provides a solution to double spending issues, transaction history tracing and transparency. Only a few months after Nakamoto’s paper was released, the first bitcoins were created on the blockchain. While some people claims that it was Nakamoto who created the bitcoin blockchain, the official creator(s) remains anonymous until this day (Sarmah, 2018, p. 23-24). After the launch of bitcoin in 2009, thousands of other blockchain-based platforms and cryptocurrencies have emerged. Blockchains such as Ethereum, Binance Coin, Tether, Solana, Cardano and XRP has emerged with their own underlying technological use (Hayes, 2022). However, Ethereum might arguably be the most significant because of its speed, security, and efficiency, but most importantly; its wide adoption. Ethereum was launched in 2015 and enabled the use of smart contracts on the blockchain (Sarmah, 2018, p. 24). Currently, bitcoin receives much attention in the blockchain universe. It is however the Ethereum and/or other platforms that aligns with the music industry’s interest best (O’Dair & Owen, 2019, p. 264).

2.1.2 Technological perspective of blockchain technology

Blockchain technology is based on a peer-to-peer (P2P) network, which means that it is not operated by one computer/server alone, but rather every computer/server that is connected to the P2P network. By using a P2P network, it will be more difficult to manipulate and change what is already written on the blockchain because you would need a majority consensus in order to make changes (Sarmah, 2018, p. 24).

Sarmah (2018, p. 25) further explains that blockchain technology is a distributed ledger that is available to anyone that is connected to the P2P network that it operates in. The user that is connected to the distributed ledger then has the possibility to verify any activity recorded on

the ledger. In its most basic form, blockchain is built up by blocks on a chain or ledger. The blocks on the blockchain are created by miners or validators and is then added to the distributed ledger in a linear and chronological order (Swan, 2015, p. 10). Once some information is stored in one of the blocks it is incredibly difficult to change because of its immutability. If we would look at one particular block on the blockchain, we will find three parts of information about the particular block. According to Sarmah (2018), the block contains information about:

- (1) the *data* for what the block was used for depending on the type of blockchain.
- (2) the *Hash* which can be referred to as a fingerprint (because every hash is unique) and it stores all the information of the block.
- (3) the *Hash from the previous block*, because if there would be any changes to the block, the hash would change and create a new block which then creates a chain of blocks. Hence, the name blockchain.

For example, if one particular block was used for a transaction of bitcoin, the first piece of information would show the sender, the receiver, and the amount of the transaction. The Hash is used to mark it with a unique fingerprint so that it could easily detect changes. If there would appear a change on the block of transaction, the Hash would be recalculated and create a new block on the same chain. The new block would then have the hash of its previous block so it could easily be traced back. If someone tried to manipulate block number two in the chain, the block after it in the chain would detect that the Hash of the previous block isn't matching, and it would change it back. The blockchain technology is able to detect such activity because of its *consensus mechanism*. (Sarmah, 2018, p. 25).

2.1.3 Consensus mechanisms

The consensus mechanism of a blockchain plays an important role in how a particular blockchain system performs essential tasks such as network data validation and block creation. The most common consensus mechanisms used in blockchain technology is *Proof of Work* (PoW) and *Proof of Stake* (PoS). Alternative mechanisms to PoW and PoS can be found in *Private* - or *Permissioned blockchains*, which will be further explain later in this chapter (Sarmah, 2018, p. 25). The different consensus mechanisms have different characteristics and performs similar jobs differently. Hence, the mechanism design of a blockchain will affect important elements such as security, accessibility, and sustainability (Cryptopedia Staff, 2021).

The first consensus mechanism is PoW, which means Proof of Work. It can be explained as a cryptographic proof where ‘the provider’ provides something to ‘the verifiers’ using some kind of effort based on computational or algorithms expense. In other words, the *miners* are the validators of the network, and they need to solve an equation in order to validate a transaction or to create a new block. When talking about blockchain, the PoW is often referred to when looking at the amount of time a specific blockchain platform uses to create a new block (Cryptopedia Staff, 2021). For example, Bitcoin has a PoW system that uses 10 minutes to create a new block on its blockchain. This means that the bitcoin PoW system average 7 *Transaction-Per-Second* (TPS). Compared to the second largest cryptocurrency Ethereum 1.0, which also currently runs on a PoW consensus mechanism, has a TPS of 30 which is a significant improvement (Hayes, 2022; Swan, 2015, p. 83). However, PoW has its challenges. Firstly, the speed of the system is slow compared to traditional systems. For example, the traditional payment brand ‘Visa’ have a TPS of 30.000 which neither Bitcoin nor Ethereum 1.0 can challenge (Swan, 2015, p. 83). Secondly, because PoW is scaled based on its computational performance, it will have a speed and scalability limitation which again will affect the expense for mining and network validating. The PoW consensus mechanism has therefore been the source for much criticism towards blockchain because of the large energy capacity it requires. Hence, new alternative consensus mechanism has been introduced which is arguably more sustainable when it comes to climate issues (Sarmah, 2018, p. 25; Hayes, 2022).

The second consensus mechanism is PoS, which means Proof of Stake and is an alternative consensus mechanism to PoW. The PoS system successfully improves some of the disadvantages found in the PoW system. PoS makes its blockchain more scalable, more speed efficient and hence more energy efficient. Instead of miners competing to validate a new block on a PoW blockchain, the PoS system randomly chooses validated validators to validate a new block on the blockchain. Hence, the main differences between the two is that the PoS system does not have miners but rather *validators*. Additionally, on a PoS blockchain there are no miners because blocks on the PoW ledger isn’t mined, but rather the blocks are *minted* or *forged*. However, in order to become a validator on a PoS system, the node needs to lock in a certain number of coins at a stake. This stake can be looked at as a deposit the validators pay in order to be certified to be a PoS validator. So, when the blockchain gets an order for a new block, instead of PoW miners competing to solve the block equation, on the PoS blockchain a random validator gets chosen to mint the block. Therefore, there is a significant difference

between PoS and PoW blockchains when it comes to electricity usage, and hence, PoS has proven to be more sustainable and efficient when it comes to energy consumption. (Cryptopedia Staff, 2021).

2.1.4 Blockchain tiers and different blockchains

We can further divide blockchain into different tiers. Sarmah (2018, p. 25-26) and Swan (2015, p. 5, 9) explains the different blockchain tiers and divides them into three different types:

- Blockchain 1.0 was the first tier of blockchain to be introduced when bitcoin was launched in 2009. Most cryptocurrencies are running on a blockchain 1.0 application.
- Blockchain 2.0 is most commonly used in financial applications which includes assets, options, bonds, etc. Additional tools such as smart contracts were first introduced on the blockchain 2.0 tier.
- Blockchain 3.0 is however, compared to blockchain 1.0, and 2.0, more scalable and easier to adapt into new areas. Hence, it can be found in various industries such as health, culture, media, justice, and law, etc.

Over the years there has emerged new types of cryptocurrencies and new blockchain platforms. However, not all blockchains are alike. The difference between the blockchains is often related to their consensus mechanism which has a significant importance for the blockchains security, accessibility, and sustainability. The different blockchains has their own characteristics, and hence, some blockchains are more suitable for some specific use. Sarmah (2018, p. 26) divides the different types of blockchains into the following:

1. Public blockchains – are open to the public, and any individual can connect to it. Hence, anyone can participate in decision making processes on the public blockchain.
2. Private blockchains – works in the same way has the former blockchain, but it's private and closed. It's only distributed to a group of people and is often used by organizations.
3. Semi-private blockchains – is a blockchain where some parts are private and controlled by a group of people, and the other part is open to the public.
4. Sidechains – is a blockchain that is used to move coins from one blockchain to another. There are different types of sidechains that can either allow one-way or two-way movements of coins.

5. **Permissioned ledger** – is a blockchain that don't use a consensus mechanism, but rather uses an agreement protocol because the blockchain users are known and trusted.
6. **Distributed ledger** – is a blockchain where the ledger is distributed to everyone connected to the ledger. It can be distributed across multiple organizations. This type of blockchain can be both public and private.
7. **Shared ledger** – is often an application and/or database that is shared by the public or an organization.
8. **Fully private or proprietary blockchains** – is different from other blockchains because it's centralized. This blockchain is used to share data within an organization and is most common in governments who share data between different departments.
9. **Tokenized blockchains** – is a standard blockchain for cryptocurrencies generation using consensus mechanisms.
10. **Tokenless blockchains** – is not actually a blockchain because it cannot transfer value. However, it is useful when someone needs to only transfer data to already trusted parties.

2.1.5 The difference between blockchain technology and cryptocurrency

It is however important to understand the difference between cryptocurrency and blockchain technology. Therefore, it is important to have a clear definition of each of the two.

As mentioned earlier in this chapter, the concept of blockchain technology was first introduced in 1991 by Stuart Haber and Scott Stornetta when they proposed a digital technology that could timestamp documents to avoid document manipulation (Sarmah, 2018, p. 23-24). However, the first time blockchain was used in real-life was in 2009 when bitcoin was introduced (Wikström, 2020, p. 112). Hence, the first actual use of blockchain was introduced to the public as a cryptocurrency, therefore, people might confuse the two. Bitcoin, and other cryptocurrencies, are basically just based on a blockchain. In the case of bitcoin, it uses blockchain in order to achieve transparency in digital transactions which is recorded on a distributed ledger. However, beside financial purposes, blockchain has a potential use in a vast number of industries and different purposes. For instance, blockchain can be used to create smart contracts, record company inventory, store, and secure patient documents, etc. In summary, blockchain technology is the underlaying technology that bitcoin and other cryptocurrencies are based upon. (Hayes, 2022).

2.2 Blockchain technology characteristics and features

2.2.1 Decentralization and transparency

A common term that is used when discussing blockchain technology is *decentralization*. The opposite term *centralized* would mean that all data and information would be stored in the same place or at the same network, and hence, be controlled by one entity. If a problem such as internet failure, fire, or human error would occur, all the data and information stored at that place would be in danger of getting lost. However, using a peer-to-peer network, the data and information would be stored on every single entity connected to the P2P network. Hence, the data is then decentralized through storage on a distributed ledger or P2P network to several connected entities, rather than on one centralized host-network. Decentralization is in many ways the very foundation and nature of blockchain technology to ensure the security of the data recorded on the blockchain. (Hayes, 2022).

Because of the decentralized nature of the blockchain technology, it provides its connected entities with a transparent overview of the activity and stored data and information on the given blockchain. This means that anyone who are connected to a particular blockchain can see and verify transactions, contracts, identifications, a company's inventory etc. However, even though transparency is of great importance, there is still possible to make blockchain activities more anonymous when using different types of blockchains. This could be done by making certain parts of the block's data confidential. While some data is hidden, the most essential data such as basic data, hash data, and previous hash data, will still be visible (Hayes, 2022). These transparent or semi-transparent features is part of the security measures of the blockchain which will be further explained in the next section.

2.2.2 The security of blockchain

As mentioned earlier in this chapter, since the blocks created on the blockchain are organized in linear and chronological order, and with the hash always controlling the changes of its closest blocks, the network would then easily detect changes and attempts for manipulation. Hence, if someone would try to hack into a blockchain and steal content from one of the blocks, it would change the hash of the block and make a copy. Therefore, when all other entities on the network compare their copies of the blockchain, the hacker's copy would be the only copy standing out, and therefore be considered as illegitimate. (Hayes, 2022).

In order to successfully change the content of a block on the ledger, it would be necessary to get a majority consensus from all entities on the network. Hence, if a hacker should successfully hack a blockchain they would need 51% or more of the copies of the blockchain in order to get majority consensus. However, it would take tremendous amount of time, money, and resources. It's because they would need to change and manipulate the hash and timestamps of all the blocks in order to get matching copies of the chain. (Hayes, 2022).

2.2.3 Smart contracts

A common term used when discussing blockchain is *smart contracts*. Smart contracts are a key feature that is built into some blockchains, and it emerged in the blockchain 2.0 tier. Smart contracts are integrated computer codes that can be used to validate and/or negotiate contract agreements. Blockchain-based smart contracts has embedded more complex abilities than just simple buy/sell transaction agreements (Swan, 2015, p. 16). To successfully use a smart contract, the different parties need to agree to a set of conditions. Once the conditions are met, the given agreement will be preceded automatically and verified by miners or verifiers (depending on the blockchain). When it's successfully verified by the network's consensus mechanism, it will be stored on the blockchain (Hayes, 2022; Wang, Ouyang, Yuan, Han & Wang, 2019).

2.2.4 Blockchain Platforms

In the digital world of blockchain technology, there is a large number of different types of blockchains and blockchain platforms. The number of blockchains and platforms has increased tremendously in the past few years. As of 2022, there has been recorded a total amount of around 10.000 active blockchain platforms and cryptocurrencies. However, there is a few blockchain platforms that leads the way in the current blockchain evolution. Ethereum (ETH) is one of the most commonly used blockchain platforms. ETH has their own cryptocurrency built into it. However, through their platform, users can create smart contracts and programmable tokens that can be used to create *Non-Fungible Tokens* (NFTs). Therefore, through the ETH platform, users can further create their own platforms which is based on ETHs infrastructure and blockchain. (Hayes, 2022).

2.3 Non-Fungible Tokens (NFTs)

To most people NFTs are a new phenomenon. However, NFTs was first introduced in 2012 when its features were presented on the bitcoin blockchain. These NFTs was used for the

representation of rights connected to property or digital artifacts. However, since it was based on the bitcoin blockchain it was very inefficient because of bitcoins relatively slow technical abilities. In later years, and up until the 2017 crypto hype, new blockchain platforms emerged with more efficient solutions that suited the use for NFTs. One of the most commonly used platforms for NFTs now are the Ethereum's blockchain platform. (Giannopoulou, Quintais, Mezei, & Bodó, 2021).

In order to understand what a Non-Fungible Token is, we need to understand the opposite of non-fungible tokens, namely Fungible Tokens. Fungible Tokens are tokens that are all alike, which means that you could trade one token for another token, and it would be the same. An example of such a token is for instance Bitcoin. One bitcoin will always be similar to another bitcoin and have the same value. However, a Non-Fungible Token is then a token that is unique and cannot be traded with another non-fungible token simply because they are not alike, and they could trade for different values. Hence, NFTs are non-interchangeable digital tokens to which you cannot trade with other NFTs or sell fragments of the NFT. (Giannopoulou et al., 2021).

NFTs can be complex and difficult to comprehend. However, the simplest explanation of NFTs is that they are digital representations of either a physical or digital object registered on the blockchain. This digital representation of an object will include either the digital object, or it would include the unique hash, or other information that could point to other physical objects that is stored off-chain (another place than on the blockchain). (Giannopoulou et al., 2021). In order to create an NFT you will first need to mint it. To mint an NFTs is simply to generate or create it and recorded the creation on a blockchain ledger. Once the NFT is minted it will be open for transaction, therefore, most NFTs will be moved to a so-called digital marketplace. This digital marketplace allows for transactions and trading of NFTs. Such digital marketplaces are for instance Rarible, Open Sea, Super Rare, enter.art, Opulous etc. Furthermore, what does an NFT actually represent? An NFT is in its basic form a representation of metadata which has been minted on a blockchain such as ETH. Smart contracts are then used to ensure the uniqueness of the given NFT and hence make conditions for the NFT to trade between the buyer and seller. (Giannopoulou et al., 2021).

Chapter 3

The Music Industries and copyright laws

In order to better understand the potential use of blockchain in the music industries, we need to access the current structure of the music industries and the current copyright system. According to Wikström (2020, p. 53) *the music industry* can be divided into different *industries*: recorded industry, publishing industry and live industry. Therefore, I will use the term *music industries* for the most part. I will present a historical perspective on the evolution of the music industries and the copyright systems.

3.1 A Brief History of the Music Industries

In this first part of the chapter, I will present a historical perspective of the music industries and the changes that it has gone through over the past decades. As you will see, one thing that repeatedly occurs is the music industry's reluctant attitude towards new technologies, and hence failure to adapt to the technological changes and challenges.

3.1.1 Digitalization

Digitalization had a significant impact on the music industries. Due to digitalization music industry operators had to change their business models in order to adapt to the digital age. While some industries recognized the changes and managed to adapt, others struggled to find their way in the digital age. Large areas of the music industries had a hard time adopting to digitalization or failed to recognize the importance of digital change. The impact of digitalization was so significant that many scholars today divide the music industries into “the old music economy” and “the new music economy” (Wikström, 2020, p. 5).

In the old music economy, physical music distribution was the main source of income for music companies and artists. Other music activities such as live music performance and radio broadcasting were mainly promotion tools to increase their record sales. The main formats that dominated the physical music market was LPs, CCs, and CDs, each more profitable than their predecessor(s). When we talk about digitalization, it is common to relate it to the emergence of the internet, online music, and music piracy in the 90s and 2000s. However, the digital revolution is considered to have started in 1982 when the Compact Disc (CD) was introduced by Sony and Phillips (Tschmuck, 2017, p. 27). The CD was a disruptive

innovation that digitized recorded music so that it could more easily fit on a more compact disk. The CD format was the leading music distribution format for 26 years after its introduction, and the revenue peaked in the year 2000. The reason for its decline was primarily because of music piracy and digital music (Wikström, 2020, p. 78-79; Sinnreich, 2016, p. 158).

However, both the CCs and the CDs had a significant issue (as well as DVDs): they could be easily copied and reproduced. Hence, in the case of the CCs, there were a large number of copies being made of CCs and homemade mixtapes. These could be further distributed and sold to others without profiting the music rightsholders. The same case with CDs and DVDs (Tschmuck, 2017, p. 28). However, when the internet became more accessible for the general public in the 90s and 2000s, digital music piracy emerged. Common people could then easily make digital copies of CDs and distribute the files online so that others could listen and download it for free. This is referred to as illegal file-sharing and were used on a peer-to-peer network so that it would be difficult to trace the uploader and downloader. Online services such as Naspers provided people with a large catalogue of music for free. Digital music piracy had a huge impact on the music industries, and recorded music industry in particular suffered severely from the loss of revenue from physical sales (Wikström, 2020, p. 78-79). Music companies, artists and musicians lost large amounts of their main source of income and had to turn elsewhere to make a living. Many turned to live music performance to make money, and live music has become one of the most important income streams for artists and musicians (Krueger, 2020, p. 236).

One important innovation that completely disrupted the music industries was the introduction of Apples application 'iTunes' in 2003 (Tschmuck, 2017, p. 29). iTunes was a disruptive innovation for several reasons. Firstly, iTunes made it possible to unbundle albums and download individual songs for a fraction of the price. Hence, the audience could easily purchase their favorite songs without the need of purchasing the entire album, and you could buy it all digitally without the need of a physical copy. Secondly, Apple made music more accessible through the usage of iTunes on different devices. You could easily synchronize your iTunes music library on your computer, iPhone, or iPod (Wikström, 2020, p.105). However, the single-song download model were still considered an ownership-based model where you owned the songs and albums you bought. Nevertheless, in the following years there happened a transformation from ownership to access-based business models within the digital music market (Sinnreich, 2016, p. 159).

Even though the single-song download model were able to grow in generated revenue, it could still not match the loss of physical sales or compete with digital music piracy (Wikström, 2020, p. 107). Therefore, the solution was to make music seem like it's free, and hence, the access-based business model appeared. Daniel Eck and Martin Lorentzon, founders of Spotify, was one of the first to introduce a music streaming service. Spotify was established in 2006 and was launched in 2008 in several European markets. Spotify provided two different types of access models: freemium and premium model. The freemium model was a model based on advertising between songs and hence generate revenue from ads. The premium model on the other hand is a model based on a monthly subscription fee that the users pay in order to access a large catalogue of music without advertising. The subscription-based model has proven to be the more profitable choice, and over the years many similar streaming services with similar business models have emerged into the digital music market. Music streaming services has provided growth in recorded music and in 2015 the revenue from streaming eventually surpassed the revenue from physical sales (Wikström, 2020, p.113-118). Today, the largest streaming services are Spotify, Apple Music, Amazon Music and Tencent Music. However, those are the largest subscription streaming services. The largest music outlet in terms of streams or views is YouTube (Marshall, 2015, p. 179; Sinnreich, 2016, p. 163; Krueger, 2020, p. 177).

3.1.2 Royalties from music companies and streaming services

The music industries have gone through many technological changes in the past decades, and in many cases the music industries have struggled to adopt to the changes. For artists and musicians, the digital environment has become both an opportunity as well as a curse. The internet has provided artists with opportunities to more efficiently produce, create, distribute, and market their music on their own without the need of traditional music companies. However, the number of opportunities and the complexity of such digital services can intimidate the artists rather than help them (Hughes, Evans, Morrow & Keith, 2016, p. 68). Through the changes in the digital music market, even though streaming provides growth to music companies, it seems like the share for the artists are getting smaller. Imogen Heap (as referred to in Tapscott & Tapscott, 2016) stated her concerns about artists in the current music ecosystem:

“It’s so fragmented; there’s so little leadership, and there’s so much negativity around the business side of it. (...) It’s all upside down. The artists are at the end of the food chain. It just

doesn't make sense. Music is everywhere, all the time. It's on our phones, it's in our taxis, it's everywhere. But the artists are getting less and less" (Tapscott & Tapscott, 2016, p.226).

In both the traditional and the new music economy, the contracts with record labels for performers, and the contracts with music publishers for composers, are essential for royalty payout for artists and composers (Krueger, 2020, p. 160-161). According to Sinnreich (2016, p. 155), in the case of record label contracts (which vary from case to case), the artist would give the record label the rights to the master recording in exchange for between 12-18% in royalties based on the wholesale. However, the artist's royalty rate could be further augmented or decremented based on expenditures such as promotion, marketing, and different business expenses. Hence, in the case of a 18% royalty payout contract, the artist could be left with half the cut, only 9%. Depending on the contract, the record label will not be obligated to pay out a royalty check until they've broken even. Hence, an artist can risk not getting any royalties until the label has broken even beyond their initial investment. (Sinnreich, 2016, p. 155-156).

In the case of a music publishing contact for a composer, the structure would be similar to a record label contract in many ways according to Sinnreich (2016). In this case a composer would assign their copyrights to a music publisher in exchange for royalties when or if their music would be exploited in commercial use such as in recordings, performed, printed, or synchronized with moving pictures. Nevertheless, a composer cannot (in most cases) assign more than 50% of their copyrights to a publisher, and therefore are more likely to receive paychecks on a regular basis. Hence, a contract with a music publisher less suspicious and more ethical compared to a traditional record label contract (Sinnreich, 2016, p.156).

Streaming services has received a large amount of criticism related to their payments to artists. Spotify has been in the center of this discussion because of their large market share in the streaming market. The criticism started as early as in 2009 when Lady Gaga reported that she had earned only \$167 for her worldwide success "Poker Face" which had been streamed over a million times. Even though the information were somewhat misleading, it started a movement of criticism and controversy against Spotify (and streaming in general).

Consequentially, several small indie labels withdrew their catalogues from streaming services and stated that these services are *"not a viable way forward for the music industry"* (Marshall, 2015, p. 179). However, Spotify's respond to the criticism has been two different answers. Firstly, they argue that the amount of royalties that the artists receive reflects their record label contract and not what they get from Spotify. Secondly, Spotify provides large

numbers to reflect the billions of dollars that they have paid out to rightsholders over the years. Nevertheless, Spotify and Daniel Eck have been clear in their argument that they *'don't sell streams, but access to music'*, and that *'people need to transition from unit-based thinking to consumption-based thinking'* (Marshall, 2015, p. 181).

Even though streaming has received much criticism, it is a fact that music streaming is growing in terms of revenue and market share. The International Federation of the Phonographic Industry (IFPI) presented data in their "Global Music Report 2022" that music streaming represents 65% of the global music revenue in 2021, which is a 24.3% increase in streaming alone since 2020. Hence, music streaming has become a significant income source for labels, publishers, artists, and other music companies. (IFPI, 2022, p. 10-11)

3.1.3 Catalogue investing

In the past years there has been an increasing amount of attention from investors towards the music industries and music royalties in particular. Music royalties has become a lucrative asset class for investors to hold because of its high recurring yields and little down-side risk. Music rights is an attractive asset for investors when compared to more traditional investments such as stocks, funds, and bonds. If we look at the numbers from 2020, the S&P 500 paid a dividend of 1.8%, the US 10-year treasury yielded 0.7%, and lastly the Vanguard High-Yield Corporate Bond yielded 3.9%. If we compare these numbers to the yields from publicly traded trust funds with interest in music rights, the difference is significant. Hipgnosis Songs Fund's (ticker SONG) paid a dividend yield of 4.3%, and Mills Music Trust (ticker MMTRS) paid a dividend yield of 9.6%. However, if you were to buy music rights directly from an exchange platform such as 'Royalty Exchange', you could increase the yield significantly. The average annualized return for all the rights on Royalty Exchange was a staggering 12%. Hence, investment bankers, hedge funds and private equity funds are turning their attention to music rights, which again is problematic because it further fragments the copyrights. (Stone, 2022).

3.1.4 Digital Rights Managements

The Digital Millennium Copyright Act (DMCA) in the US in 1998, and the EU Copyright Directive (EUCD) of 2001, aimed to regulate the use of copyrighted work in the digital area and to reduce the amount to music piracy (Both DMCA and EUCD will be accessed later). As a consequence of these copyright acts Digital Rights Managements (DRMs) emerged in order

for culture industries corporations to protect their content. The DRMs uses different types of tools and technologies to control and govern the use, modification, creation, and distribution of copyrighted digital content. (Hesmondhalgh, 2019, p. 168).

Because music piracy made music a public good, new business models emerged to prevent that from happening. The use of DRM was a business model where they thought they could make music a rivalry good again. With DRM they could control the number of users and the number of copies that were allowed for a digital product (Nordgård, 2018, p. 61). For example, when Apple launched iTunes in 2003, they used a DRM technology called *Fairplay* which made it impossible for users to play their purchased songs from iTunes on non-Apple devices. Nevertheless, when other single-song download services that didn't use DRM appeared, such as Amazon's service, Apple's iTunes were forced to leave the DRM model in 2009. (Wikström, 2020, p. 107).

3.2 Brief history of copyright law

“For anyone with any interest in music, copyright is vitally important, more important than any other concept in making sense of the variety of social practices that make up ‘the music industry’. Copyright provides the framework for every business decision in the industry. (...) Copyright, one might say, is the currency in which all sectors of the industry trade”. (Frith & Marshall, 2004, p. 1-2).

3.2.1 Early copyright acts

The statute of Anne has become known as the first copyright legislation. The statute of Anne was a copyright act that took place in 1710. This copyright act protected the authors rights for the authors literary works. The copyright act of 1710 laid the foundation and framework for future copyright laws, and would later include copyright protection for paintings, drawings, and music (Wikström, 2020, p. 20; Tschmuck, 2017, p. 13).

Later on, the Berne convention was adopted in 1886 and is perhaps the most important copyright law in the music industry. It was created in order to protect literary and artistic works for artists, painters, poets, composers, lyricists, and so on. The Berne conventions aimed to help creators to control the use of their work and strengthen their *authors rights* and eventually their *moral rights*. The authors rights give the author the right to decide the usage of their work, and the user can use the work with the author's permission. Moral rights give the author the right to claim authorship and to be recognized as the author of a certain artistic

work (Wikström, 2020, p. 21). Moral rights give the author the possibility to object to any reproduction, manipulation, modification, and other use of their work that the author doesn't see fit for their work, reputation, and honor (WIPO, 2021).

Since 1886 the Berne convention has been revised to further develop and adapted to new technologies in order to better monetize copyrights in different and new areas in the music industries (Wikström, 2020, p. 21). Wikström (2020) states that the Berne convention was first and foremost a European copyright act, however, after USA signed the convention in 1989, the Berne convention has been recognized as a significant instrument in international copyright laws. After the digital revolution in the late 90s and early 2000s when digital music emerged, there have been several new copyright treaties and legislations that was founded in order to adapt to the digital era. (Wikström, 2020, p. 22).

3.2.2 Copyright and Related rights

Hesmondhalgh (2019, p. 164) claims that intellectual property can be divided into three types that protects different types of work and ideas. He divides them as follow:

- *Patents* protect ideas, non-obvious, useful, or applicable to industry.
- *Trademarks* protects symbols intended to distinguish the products of companies from one another.
- *Copyright* protects literary and artistic works. Copyright protects the expression, not the idea (patent).

Out of these three types of intellectual property, copyright is the most significant within the music industry. Nevertheless, patents and trademarks are of significant as well, but not as crucial as copyright (Hesmondhalgh, 2019, p. 164).

The Berne Convention divides copyright into two different categories: economic rights and moral rights. The economic rights enable rightsholders to collect financial reward for the use of their literary or artistic work. The moral rights enable the author(s) to take action to preserve and protect their work. (WIPO, 2016, p. 9).

The author has the right to decide the usage of their work, and the user can use the work with the author's permission. Users are often given permission through a license provided by a collecting society, not directly from the author. WIPO (2016, p. 10) states that economic and moral rights can be further divided into different categories from which a rightsholder can further authorize or forbid the following:

- The reproduction of works in various forms, such as sound recordings.
- The distribution of copies of literary or artistic works.
- The public performance of the author's work.
- Broadcasting and other communication of the author's work.
- Translation of the author's work into other languages.
- Adoption of the author's work.

Related rights, also known as neighboring rights, protects individuals and entities that has a legal connection to a literary or artistic work through artistic contribution and/or contribution to public availability. WIPO (2016, p. 27) states that related rights can be granted to three different beneficiaries:

- Performers *for their contribution to give life to artistic works.*
- Producers of sound recordings *for their creative, financial, and organizational resources to make sound recordings possible.*
- Broadcasting organizations *for making the works available to the public.*

3.2.3 Collective Management Organizations

In order for rightsholders to collect their copyright, and for music users to license the use of music, rightsholders use collecting societies to license their music on their behalf. This is off course a more efficient way of licensing than to license each individual user. Such collecting societies have different names: Performance Rights Organization (PROs) or Collective Management Organizations (CMOs) (Cooke, 2015, p. 18). In this thesis I will use term CMOs for these collecting societies.

CMOs are defined as non-profit organizations that are used by two groups of copyright owners. The first group of copyright owners are those who are protected for their creative and artistic work and contributions. The second group of copyright owners are those who have an economic investment in the exploration of the artistic and creative works. The former is the composers and lyricists, and the latter are often larger corporations such as music publishers and record labels. The CMO's function is to execute three main processes: 1) provide users with licenses, 2) to collect royalties on behalf of the rights owners, and 3) to distribute the royalties accordingly to the copyright owners. (Schroff & Street, 2018, p. 1307).

CMOs license the use of artistic works in different ways. In the case of a venue, a café, or a barber shop, they would need to pay a license fee in order to legally use music. The use of

music might differ from place to place as well. In some cases, such as in a café or restaurant, the music is used as background music, and hence, licensed differently than if music is performed at a concert venue. Nevertheless, in order to make licensing easy for the user, CMOs provides *blanket licenses* to larger corporations so that they can use an unlimited amount of music from the music that the CMO represents in their productions. These corporations could for example be major broadcasting organizations or major store companies that uses music in their stores. The blanket license than makes the use of music more cost-efficient for the companies compared to if they had to license the works independently, which again would be very expensive. (Lyons, Sun, Collopy, O'Hagan, Curran, 2019, p. 30).

CMOs are present in almost every European state and are in most cases operational monopolies (Schroff & Street, 2018, p. 1308; Tschmuck, 2017, p. 71). Because of the CMOs monopoly position it has been important to ensure that their monopolistic market position isn't abused. In order to ensure that monopolistic abuse won't occur, the issue has been subject to regulation on EU and other government level (Schroff & Street, 2018, p. 1305-1306). EU directives and other copyright regulations and legislation will be presented later in this chapter.

In order for CMOs to monetize the use of music, they use digital mechanism technologies that works in different ways. CMOs has used tremendous amount of time, effort, and capital to ensure that their data systems work properly. However, because of the transition to the digital music market, the current data systems that the CMOs uses might be insufficient in the digital ecosystem (Lyons et al., 2019, p. 78). Nevertheless, the technologies they use are referred to as ISWC, ISRC, and ISNI. These are international codes that helps CMOs to monetize and collect data. The first one is International Standard Work Code (ISWC) that monetize the musical work that it is assigned to. The second one is International Standard Recording Code (ISRC) which monetize the underlying sound recording (Lyons et al., 2019, p. 33). The last one is International Standard Name Identifier (ISNI) which is used to link the ISWC and ISRC to a person (Lyons et al., 2019, p. 11).

The ISRC is a code that every new recording requires in order to identify the use of the recording. However, when a recording is released in different regions and countries there will be given new ISRC codes to each of them. Hence, one single recording can have a cluster of multiple ISRC codes linked to it. The purpose of the ISRC is to ensure interoperability and interaction with other registers, but seemingly it is not capable of doing what it's supposed to do. (Lyons et al., 2019, p. 61).

The ISWC was created in 1995 and aimed to develop a new digital tool that could move the industry away from standard paper-based management. The ISWC was supposed to be more efficient, have better automation and have more speed when handling data processing. The ISWC was said to provide creators, rightsholders and their CMOs the ability to identify unique musical works across any geographical borders. (Lyons et al., 2019, p. 63).

3.3 Copyright developments and Policies

Since the millennium, there has been several acts and directives from governments and commotions. However, I will not go in detail for every single one, but rather give a brief description of the most important developments in copyright laws.

3.3.1 Digital Millennium Copyright Act

The Digital Millennium Copyright Act (DMCA) was introduced in 1998 in the United States during the emergence of the internet. At the time, there was an increasing amount of illegal reproduction and distribution of copyrighted content on the internet, and organizations in the music industries lost control over the usage of their content, as well as decreasing revenue numbers (Wikström, 2020, p. 78-79; Tschmuck, 2017, p. 226). Thus, the DMCA copyright act was signed by President Bill Clinton to ensure a more secure online regulation of unauthorized use of copyrighted content. Keplinger (2001, p. 4) states that the DMCA copyright act:

- a) *Prohibits actions aimed at pirating digitized copyrighted works while still permitting legitimate activities.*
- b) *Protects copyright management information – the kind of information attached to a work that identifies the author or the owner as well as terms and conditions for the use of the work.*

One significant characteristic of the DMCA is that it provides a ‘safe harbor’ for online intermediaries such as YouTube. In this case, the online platforms and intermediaries can under some circumstances not be held liable for copyright infringements that are posted on their platform (Tschmuck, 2017, p. 226). In the case of YouTube, the content is created by the user, known as User Generated Content (UGC). This has caused the giant technology companies to draw more revenue to themselves rather than to artists and rightsholders (Trapman, 2016). IFPI claims that the major tech companies have ‘misapplied’ the safe harbor law, and hence, claimed a larger share of the advertisement revenue that should have

gone to rightsholders. Therefore, there has been much criticism and controversy towards the way these online platforms operate and how they distribute and how much they distribute to rightsholders (Lyons et al., 2019, p. 109).

3.3.2 EU directive (Article 11 and 17)

"It helps make the internet ready for the future, a space which benefits everyone, not only a powerful few." – Axel Voss (cited by Kleinman, 2019)

In 2019, the European Council introduced the European Union Copyright Directive (EUCD) which is based on copyright and related rights in the digital music market. The EUCD has been subject for many discussions and has received criticism by scholars and others from the music industries. The directive has a significant relevance in the music industry today, mainly because of the large number of musical content and works that are uploaded or exploited on online platforms and on social networks. The EU directive is therefore an attempt to better adapt copyright law into the digital music market and the digital environment in general. The directive has therefore taken user behavior into account in order to better understand the consequences and the effects that digital platforms have on rightsholders. (Kleinman, 2019).

In the EUCD, article 11 and 17 (formally article 13) have the most significance for the digital music ecosystem. Article 17 is targeting the tech-majors that control online platforms such as YouTube, Facebook, Twitter etc., and require that they take more active actions to ensure that copyrighted content is preserved in a manner that benefit the rightsholders. Such active measures from the tech companies include filtering or removal of copyrighted content and the EUCD claims that the tech companies should be held responsible for copyright infringements and fragmentation. Hence, through this model, the EUCD wants to turn revenue streams away from the tech giants towards artists and rightsholders instead. (Kleinman, 2019).

In a brief summary, this is what article 11 and 17 claims in the words of Kleinman (2019):

- Article 11 states that search engines and news aggregate platforms should pay to use links from news websites.
- Article 17 hold larger technology companies responsible for material posted without a copyright license. Tech companies already remove music and videos which are copyrighted, but under the new laws they will be more liable for any copyrighted content.

However, the giant tech companies are so integrated in the laws of the DMCA, and they are quite reluctant to let go of their ‘safe harbor’ that the current laws provide (Tschmuck, 2017, p. 226-227). Hence, the issue with the EU directive is that it makes significant and quite drastic changes to how the online platforms should operate. As a consequence, there has been major conflicts between Alphabet (Google and YouTube) and both the US and EU copyright parliaments. Alphabet claims that the regulations make it difficult for both creators and platform operators. Hence, Alphabets YouTube claimed that the consequences of article 17 could result in YouTube ceasing their operations in the EU. (Lyons et al., 2019, p. 110).

3.4 Issues with the current copyright system

3.4.1 Three major copyright issues

According to Daniel Nordgård (2018), there are three major copyright issues at hand in the current digital environment:

- Issues on public approval
- Issues on economics of copyright
- Issues on digital licensing

First of all, the public view and approval of copyright has change dramatically in the digital age. Previously, before the digitalization of the music industries, the public had little or no knowledge or awareness for copyright because of the physical environment they lived in and the constrains that came with it. Nevertheless, besides private copying of CDs and CCs, there were little copyright issues for the common public to exploit. However, in the digital age and the emergence of music piracy, copyright has moved from physical constrains over to the publics moral norms around how they use and listen to music. Music piracy helped consumers to turn against recorded music and copyright laws, which again had significant impacts on the recording industry and their control. (Nordgård, 2018, p. 14-15).

Secondly, Nordgård (2018, p. 15) explains the issues related to the economics of copyright. He claims that the economic copyright issues go beyond music piracy and peer-to-peer. In many ways, copyright can be recognized as an economic representation of a tradeoff between the publics’ acceptance of the creator’s product and the creator’s incentive to create. Hence, the issue goes beyond the commercial and industrial copyright perspective and more towards creators’ incentive to create, even though copyright structures has been damaged for them since the millennium (Towse, 2004, as cited in Nordgård, 2018, p. 15).

Thirdly, and perhaps the most challenging issue from a technological perspective is the copyright issues related to digital licensing, distribution, and consumption of music in a digital world where the standard technological copyright framework does not work as efficiently as intended. Consequentially, the music industries struggle to offer proper licensing deals in the digital environment, much because digitalization made music into public goods. Hence, because music has become a public goods, companies and/or industries can use and benefit from usage of music without taking copyright laws and moral laws into account (Nordgård, 2018, p. 16).

3.4.2 Issues with the current ISO standards

As mentioned briefly earlier in this chapter, there has been some issues related to the standard codes used for identification and surveillance. Lyons et al (2019, p. 62-63) presents some issues with ISRC, which is mostly related to misuse:

1. Production

The issue of ISRC can start as early as in the production phase of recording. There is little public literature on how to assign ISRC, how to use it, and the importance of issuing an ISRC. Hence, few producers and songwriters are aware of its importance.

2. Record labels and aggregators

Record labels and aggregators create and manage most of the ISRC codes. Therefore, the way that they register and maintain the ISRC codes are crucial. However, there are some misuses of the ISRC codes in record labels and aggregators which causes poor practice. Hence, issues such as ISRC duplications occurs, which again takes away its key feature; to be a unique identifier.

3. Intermediaries

ISRC issues can also be linked to human and system resources, including capital and knowledge that a company can use in data management. The resources can vary from larger independent labels and distributors to smaller and even single-owner labels. Hence, the capacity for good quality data management is unpredictable.

4. DIY artists

The emergence of DIY artists has caused ISRC issues and misuse. Much like the producers and songwriters, the DIY artists often lack knowledge and competence to manage their ISRC. Even if they are using a distributor, they often need to manage their codes. Hence, good quality data and practice is not guaranteed.

Furthermore, Lyons et al (2019, p. 63-64) presents three core issues that were identified related to the ISWC:

1. The complex nature of music publishing

Because of the complex nature of the music publishing industry, it becomes difficult to identify and store high quality ISWC data. Hence, the use of ISWC becomes less consistent. The issue is grounded in that there are often several songwriters registered on the same tracks, and each one at different publishers. Therefore, there are issues with different type of ownership and control of rights.

2. Competing time pressures

In order for a ISWC to be assigned to a track, all the writers and rightsholders needs to be identified. Because of the complexities of fragmented rights and multiple ownerships, the ISWC often suffers from a time delay. Therefore, the ISWC are often assigned late in the process of a release, or not assigned at all in some cases. Hence, the ISWC is not linked to the recording upon release.

3. Open standard; closed data

Even though the ISWC is an open standard code, the data related to it is often closed. The reason for this is because of the issues related to linking ISRC and ISWC. While some rights managements are able to link the sound recording and the underlying musical works, others have difficulties when it comes to multiple ownerships. For example, UMG owns Coldplay's publishing, but WMG owns their masters. The problem is than that there is restricted access to reliable data for the ISWC.

Chapter 4

Methodology: A mixed research approach

4.1 Methodological approach

In this master thesis, I will be using mixed methods research in order to gather data for my research. Rather than only using either traditional qualitative or quantitative research, I will be using both in order to get a broader perspective in my research. Mixed methods research is defined as a form of research where the researcher combines research techniques, approaches, concepts, and methods from the traditional qualitative and quantitative research methods into a single research method. By using mixed methods research, the researcher doesn't limit their choices and possibilities in only using one traditional research method (Johnson & Onwuegbuzie, 2004, p. 17). When using mixed methods research it is important to understand the key characteristics of the traditional research methods. When understanding the key characteristics, the researcher can understand the strengths and weaknesses of each method. Hence, the researcher can construct a mixed method research where the traditional research methods complement each other and together create a more legitimacy in the research, rather than limit and restricting the researcher's choices (Johnson & Onwuegbuzie, 2004, p. 18).

As mentioned, the researcher needs to understand the key characteristics of both traditional qualitative and quantitative research in order to establish a good foundation for the methodology that compliments the research question(s). Johnson and Onwuegbuzie (2004) explain the key characteristic of traditional quantitative research as a focus on *deduction, confirmation, theory/hypothesis testing, explanation, prediction, standardized data collection, and statical analysis* (p. 18). Johnson and Onwuegbuzie (2004) further explain the key characteristics of traditional qualitative research are *induction, discovery, exploration, theory/hypothesis generation, and qualitative analysis* (p.18). In addition, in qualitative research, the researcher is the key instrument for the gathering and analysis of the collected data.

When understanding the structures and characteristics of the traditional research methods, the researcher can build a mixed research model where the methods complement each other and the research question(s). Johnson and Onwuegbuzie (2004, p. 21) summarize the strengths of using mixed research as:

- Providing the strengths of both qualitative and quantitative research.
- The researcher can generate and test a theory more broadly.
- The researcher can answer a wider and broader range of research questions because he/she is not limited to one research method.
- The researcher can use the strengths of one method to overcome the weaknesses of the other method.
- The researcher can find stronger evidence for conclusion through the findings of both methods.
- The researcher can add insights and understanding that could be missed when using a single method.
- The combination of both qualitative and quantitative research together produces a more complete knowledge necessary to inform and practice.

4.2 Data collection methods and analysis

For the qualitative part of the research, I have gathered historical and current data and information that can provide a research foundation for the quantitative method. I will collect data from various data outlets. A large portion of the data have been collected from articles and books written by renowned scholars. However, other data has been collected from various internet outlets such as Google Scholar, Oria (University of Agder database), Investopedia, Music Business Worldwide, Company's websites and blogs, etc. Since the amount of relevant academic books related to blockchain technology and modern music industry structures are limited, internet pages as mentioned has been of great help to receive relevant and up-to-date literature and data. Documents, articles, books, and blogs were thoroughly read, summarized, and paraphrased to fit the research topics and issues. All of these data outlets were used to build the final outcome of a large portion of the thesis.

4.3 Semi-structured interviews

Denscombe (2010, p. 173-174) explains that *“when the researcher needs to gain insights into things such as people’s opinions, feelings, emotions and experiences, then interviews will almost certainly provide a more suitable method”*. Hence, in this study I find it appropriate to conduct interviews in order to collect insight from music business and technology experts on the study’s objective and theme. The study includes complex, subtle and technical themes and issues related to blockchain technology as a phenomenon.

When I constructed the interview, I wanted to focus the different sections of the interview on different aspects related to the research. Firstly, I wanted the informants to present themselves and their general view on the music industries and their understanding of blockchain technology. Secondly, I wanted them to go more in-depth on the topic of blockchain technology. Thirdly, I wanted the informants to present their perspective on how blockchain would fit in the music industries and how it would affect people and sectors within. I wanted the interviewee to feel free to make statements, reflections and reference new ideas and perspectives. Hence, by using a semi-structured interview, the interviewee had that opportunity.

4.3.1 Ethical concerns

When using interviews as one of my research methods there are some ethical concerns related to my informant's anonymity and the impact of sensitive information about their company, their work, and/or their reputation within their communities. To ensure that ethical measures were followed, it was crucial for me to priority confidentiality when interacting with the informants. Each informant was informed about the thesis and what their participation would involve. I made it clear that I don't see any risks for the informants to participate in the project. However, they will have the opportunity to withdraw from the research at any time. In order to ensure that the informants understood their purpose and reason for involvement, each one of the informants had to read and sign a consent form. Each of the informants were in addition given a choice to choose whether they would like to stay anonymous or if they would like to be presented more publicly. I would respect either choice, however, I'm very thankful that both informants choose to be presented publicly by name. The consent form that was used can be found in the appendix.

4.3.2 The interview guide

The interview guide was designed to have three sections with a total of 13 questions. The first section of the interview was an introduction where the informants could present themselves, their current and prior work experience, location and so on. They were also asked to clarify their view and understanding of what blockchain is or isn't, as well as some general views on music industry issues.

In the second section the questions are more focused on blockchain technology in general, including pros and cons. In the second section, the informants can give a more general and

broad explanation of blockchain without the need of linking it to the music industries in particular.

In the third and final section, the questions turn more towards the music industries and the informant's views on blockchain technology within it. In this section I wished to get a deeper understanding of the informant's perspectives on how blockchain might change or impact different sections of the music industries. The questions take different perspective into account, such as consumers, technological and practical perspectives, copyright, streaming and platform services, etc.

As mentioned previously, the interview was conducted as a semi-structured interview where the interviewer and interviewee were free to ask and/or elaborate further on questions from the interview guide (Denscombe, 2010, p. 174). The interview followed a constructed interview guide which can be found in the appendix.

4.3.3 The choice of the informants

When choosing the informants for this research, I had some criteria the informants had to fulfill in order to qualify for participation. This is the criteria I used when choosing informants:

- The informant requires several years of experience in either the music industry or the technology industry.
- The informant needs to have a great understanding of either blockchain technology or the music industry, preferably both.
- Is currently active in music industry, technology, and/or related industries.

In this study I have used a semi-structured interview model. Because of the time-consuming aspect of using a mixed research method, I have limited my research to 2 participants. As mentioned, they both signed a consent form and had the opportunity to look through the transcribed interview, and hence, they could more easily take measures to ensure their own and others privacy. Nevertheless, here are the following informants who has participated in the research:

Nic Garnett

Nic Garnett is currently working as a consultant in Norcode where he's working as a project manager for the development of rights management technology in the African market. Garnett

has previously worked for other major organizations such as IFPI (where he worked with anti-piracy campaigns) and in Intertrust (where he worked with Digital Rights Management).

Ken Umezaki

Ken Umezaki is CEO of Verifi Media which is a service that allows information to be systematically shared, maintained and updated, and also collaborated upon by the various stakeholders. He has been in the music industry for about 12 years and worked previously in finance for 25 years. Additionally, he's a private investor and advisor for music startups and artists. He has co-founded three companies, where Verifi Media is the third company he co-founded.

4.3.4 Transcription and interview analysis

The plan was to conduct the interviews in English in order to avoid time consuming translation work. Both participants that accepted to participate are English speaking. The interviews that were conducted lasted around 60 minutes, and the interviewees were able to discuss and reflect freely upon the questions and make references to previous topics and introduce new additional topics and perspectives.

Transcription is time-consuming work and generates a large amount of data. I used Microsoft Word's "Dictate" tool to be able to transcribe the interviews at a faster pace and went back and looked through the text and did necessary changes. After transcribing both interviews I was left with a transcript of approximately 13.000 words. The informants were then given the opportunity to read through the transcription and make changes if they preferred to. The analysis of the interviews happened simultaneously as the transcription. I wrote down reflections and context perspectives as I transcribed. I marked the sections of the interviews that were of most interest to me so that I could easily find my way back. The full transcriptions of the interviews can be found in attachment 3 and 4 in the appendix.

4.4 Limitations

All research methods have their own limitations, weaknesses, and challenges. Johnson and Onwuegbuzie (2004, p. 21) presents the weaknesses and challenges of using mixed research as:

- More time-consuming
- The researcher needs to understand multiple research methods.
- The research might be difficult for one researcher to carry out on their own.

Nevertheless, I have in this research taken measures to prevent unnecessary time-consumption and workload. I have prioritized efficient transcription methods in order to avoid unnecessary workload. I have collected primary research data in an efficient and structured way, and the secondary data has been collected efficiently through trustworthy outlets.

Chapter 5

Findings

5.1 Findings from the interviews

In this chapter I will outline the findings from the conducted semi-structured interviews I had with the two informants. I have tried to find the core elements of their answers in order to present more compact answers. However, some answers require more text than others, and hence, some answers might be long. Nevertheless, in those cases I see it necessary for the question to be answered properly.

Firstly, I explained to the informants that blockchain could mean different things to different people with different backgrounds. It can be more or less about the strict use of ledgers, or it could be integrated with more traditional digital technologies. For the purposes of the coming questions, I would ask my informants to provide a short explanation or delimitation of what they mean by blockchain technology. Both view blockchain as a useful tool and a way of doing things, and both also recognize its broad use limitations.

Nic Garnett: *“Blockchain technology for me is basically what people talk about, which generally is the distributed ledger system. For me blockchain is a way of doing things. (...) I don’t think it has any particular applications in the music industry, it can be adopted there, but I think there are problems in the music industry that prevented it being used properly there”.*

Ken Umezaki: *“Blockchain is still an emerging technology, it’s a tool. It is not a ‘one shot fix everything’ tool at all. In fact, most emerging technologies that I’ve had a chance to work with are ‘work in progress’ for a good decade or longer. (...) In our case, the chain is not what we use as ‘THE solution’ to get to our primary value proposition, it’s a component of what we do. So, we often talk about the fact that we are a rights management solution that is anchored on the blockchain, but we’re not a blockchain solution for rights management. (...) It’s still an emerging technology, it’s a useful tool for some things, but not everything. You do need to actually really understand it well to know the pros and cons and try to evaluate what the most effective deployment is or whether you should deploy it at all”.*

In order to get a broader picture of the music industries and its issues, I asked the informants to give a description of what they thought were the most pressing issues in the music industry right now. Both informants highlighted the digitalization of the music industry and its data problems.

Nic Garnett: *“The way the music industry evolves. I started in the music industry 40 years ago. (...) The record industry was an industry based on buying talent, performers, and composers at the lowest possible cost, and selling their output at the highest possible price. That’s a very simple business model. (...) Now it’s moved mostly to streaming. (...) But streaming is a really wired model for the music industry because it’s a very flat model, and there are limits for the revenue it can generate in the sense that it’s a rental model. There’s only so many renters out there, whereas where the sales model, you always have the opportunity of massive sales on a particular title, which isn’t really there in streaming cause everybody pays the same price for everything. (...) I don’t see it growing so much more. I don’t think that the music per say has got much value left in it. The second issues I think is most pressing in the music industry right now – it’s never got its data act together. It will tell you that it’s doing great stuff with coding systems like ISRC and ISWC. ISRC doesn’t do what it claims to do which is to uniquely identify every original sound recording. Because it hasn’t got mechanisms for managing the data, most ISRC databases are full of duplications, and rubbish, and goodness knows what. And it doesn’t seem to be much of an effort to clean it up”.*

Ken Umezaki: *“I think my thesis around the music industry, first of all, in context, is that it’s an extremely small industry in terms of revenue scale (...) At the end of the day it’s the smallest of the media businesses. Some people will say it’s about 60 billion in revenues per year globally, up from 50 billion 10 years ago (...). There are individual companies that make more money than that a year. (...) The second thing is we are clearly in a digital transformation. (...) The digital landscape now dominates the monetization of at least recorded music - take live music out for a second - that’s in the digital sphere, so you now have a definitive business regime that is 80% to 90% driven by digital output. (...) The big issue to me is that the music industry has not evolved quickly enough to be really a data-driven business model. (...) That’s a theme that we at Verifi think about a lot. The biggest opportunity we think we have is actually making the music industry and the people who are working in it more literate*

on how to work with data and how to manage their business from a data lens. (...) And that's an industry wide challenge and a necessary foundation in order for the industry to do things well. The last component is that data complexity is increasing. The need for more transparent or better data is growing at a rapid rate. (...) The only way you can actually figure out how to do that well, in my opinion, is you got to have a much more rigorous data service or hub that the industry can actually draw upon to understand 'who owns it' and 'whether or not the thing's licensed'. Those are the two things you got to figure out and if you can't figure those out, I don't care how good your tech is, I don't care if there's blockchain or not: whatever you're doing is not going to actually scale. (...) So, we've always believed that firstly, we got to make that question answerable systematically and when and if it happens, we have got ourselves the ability to make that data literacy happen”.

I then asked Umezaki an additional question where I asked him to elaborate further on how Verifi Media cope with the type of low-quality data that's currently floating around in the music ecosystem. Umezaki further explained the current state of the data quality in the music industry and how we can better the data quality by sharing data through data collaboration.

Ken Umezaki: *“Because of my background (I did very algorithm and data intensive products for the most part of my life in finance) (...). If you took data literacy using that term again broadly in finance, it almost definitely has to be or is on a scale of 10 and 9/10 or so. (...) The music industry having that vantage point, and this is not a critique, it's just a status of where we are, I think it's like a 2/10. (...) The idea is to enable things to happen more efficiently, faster, make more money, operationally more efficient, service your clients better. Those are all not crazy things to try to accomplish with music data - in our case, music rights and metadata – because I've seen the other side. It's doable in finance, so you can do it here. (...) The reason why I say it's a 2/10 is not discrepancies, per se, but that there's just data gaps everywhere. (...) You see, as we've worked with our clients we've seen these large data gaps, even in the largest music organizations in the world. (...) We are trying to get more clients to join in on a shared data and data collaboration piece to fill in the gaps first, then you worry about the discrepancies, then you get into the fun stuff; algorithms to normalize the data, cleanse the data, etc. (...) The state of the data is actually bad. (...) We're getting close to a 4 with a limited group of organizations. (...) I think it's a*

very good thing because that means that our company and clients of ours, and others are thinking seriously about being data driven”.

I then moved towards blockchain technology, and I asked my informants to describe what they believed to be the pros and cons of blockchain technology. Both looked at blockchains immutability and transparency as big pros. The cons they presented included technical issues with interoperability, block limits, scalability, and energy consumption.

Nic Garnett: *“Well, the pros are theoretical, and I think the cons are real. The theory is that with blockchain everything can be perfectly accounted for, there can't be any trickery in the system, because you got these distributed ledgers everywhere, and everything is set in stone. (...) All of this can be supported by smart contracts, which means that everything is connected. (...) Everything will be transparent, everything will be straight forward, everything will be minutely recorded and accounted for. (...) But is that what the industry wants? I'm not sure that it does. (...) I don't think the industry have the data systems in place to support a proper cross industry blockchain application. Cons for blockchain, I think the biggest one is that they are proprietary systems, and they don't talk to each other, so, you've got the age-old problem of interoperability. The other thing is that blockchain is supposed to be irreversible, once it's on the blockchain is on the blockchain. That's not how commerce works, we're always revising deals, we're always going backwards and doing things again”.*

Ken Umezaki: *“I believe this notion of distributed immutability is actually the thing that's the biggest pro of blockchain tech. (...) It got some inefficiencies which everyone likes to talk about. Whether it's that the bitcoin mining spends more electricity than the entire country of Norway does in a year, or maybe more recently the expense of registering data, with the emergence of a lot of applications that are finance driven within the Ethereum universe in particular. (...). There's been many attempts to take what some people have termed 'enterprise blockchain use case' and try to implement something at scale. It has not happened yet. (...) No one actually found a great home for data centric blockchain use where a supermajority of the technology is actually the chain. (...) I think that actually says a lot about where we are in the evolution of what blockchain technology can do. (...) There are examples of people trying to figure out how to do mining/ transaction costs much more efficiently. Like, 'proof of stake' versus 'proof of work', (...). You have examples of organizations trying to figure out the data limitation of a block, because there's actually a limit to*

how much you can actually store directly on the chain. That creates lots of issues if you can't store stuff. (...) Having said that, it's still going to be another 5 to 10 years in my opinion before we see enough use cases. Those are to me some of the big challenges for the chain”.

I then asked my informants to share their thoughts on whether they thought that blockchain is an ideology or if it is a practical engineering tool, or if it's both. Both agreed that blockchain is a practical engineering tool.

Nic Garnett: *“I think it's a practical engineering tool. (...) Many of these blockchain initiatives I've seen in the music industry start with the idea that ‘the music industry has so many problems with its data, we can solve that with blockchain’.*

Unfortunately, you can't, because blockchain is only as good as the data you put into it. The blockchain itself doesn't solve the data problem. I think it's also hampered by all the confusion about smart contracts. Because I'm a lawyer by training, and smart contracts in my book is not a contract, it's bad use of words. Certainly, under English law, in order to have a contract you got to have two human beings who agree to do something, not two machines. That's problematical too. So, I think that blockchain is a practical engineering tool”.

Ken Umezaki: *“I think it's the latter. I think there's a lot of people who is like ‘let's stick it to the man’. That's why Bitcoin was created, to get rid of central banks or whatever. You can attach an ideology to the technology and a perspective, and maybe some people get excited. But you can do that with almost every form of tech. (...) But the underlying thing that's really going on, back to what I said earlier, is sort of this idea of a distributed immutable place for information to reside that is both protected but also free from controlling entities. (...) I don't think it's an ideology, I think it's a tool, one that's still emerging, and a lot of stuff still needs to happen to make it much more acceptable”.*

I then asked Garnett about where he could see blockchain technology being used in the digital music industry. Umezaki is actually working with blockchain in the music industry, hence, I only asked Garnett this question.

Nic Garnett: *“In theory everywhere because it's all about transactions. But the other problem in the music industry is that it's a very conservative industry. It hates to change and do things new. Which is why the record labels struggled for 20 years*

before they started making money in the digital space. They're very reluctant to change. One of the things that we are facing in Africa is; technology is the easy part, what's difficult is to change people's mindset for the idea that they give up the old-fashioned way of doing things and adopt new technology which does things in a different way. So where could blockchain technology have a place in the digital music industry? Probably managing the data from streaming. But you could set up systems where all the streaming transactions would be managed through blockchain systems, but to do that you would need a tremendous amount of work across the industry. (...) The industry is very fragmented. There are different blocks of interest; there's the record labels, there's the composers, there's the music publishers, there's the collective management organizations. They're all fighting for their lives. Often that fight involves a lot of resistance to change. In theory, again, blockchain could be useful but I don't see it happening across the board".

Then I asked my informants some copyright related questions. These questions included whether blockchain technology is compatible with the current legal framework in the US and in Europe for music copyright? Will it work both for the master recording rights as well as the master works rights? These copyrights are fluid, ownership, and shares subject to change; how, to your mind, will that impact the effect of the blockchain? The informants gave the following answers:

Nic Garnett: *"I don't think that there is any fundamental obstacle in either the civil law system of what we call 'authors rights', and the 'common law system' of copyright, to prevent the use of blockchain technology. (...) There are some complexities because I'm talking about the 'economic rights' in works in music. There are also, certainly in civil law systems, what we call 'moral rights' (...). Those are well established in European civil law, and you can't negotiate them, you can't sell them, you can't transact in relation to your moral rights. (...) So, the moral rights in copyright are not something that can be dealt with in a blockchain systems. But that's not a major problem, you're still going to be dealing with the economic rights, so, I don't think there's any problematic objection to using blockchain because of the structure of the copyright law".*

Ken Umezaki: *"Music rights are first and foremost a data problem. It has nothing to do with the blockchain. (...) There are data gaps everywhere. (...) First of all, you have to think of it comprehensively in today's world, and it's a data problem. We have*

to aggregate the data from both the works and the recording sides (...). And then you also need to unify the data across the places where this data resides, (...). So, the creators, or sometimes our management company, the label, the publisher, the CMO, the distributor, and the streaming service, they all have data, and it turns out they all have slightly different data (...). So, unifying them is a massive benefit to each of these organizations. Because they can do their job, their part in the value chain better. (...) Ours is a partial blockchain solution, not a full one. So, here is what we do, (...) we actually take a copy of every client data, and we normalize it into our verified data schema. The point is then to share it with others and create a better truth. (...) Then the last part is, (...) change management. Change management and deployment of change, we do that within our service, but it's also a great place to keep track of changes. (...) So, we are not a node-based cooperative, we are a data alliance as we call it, and it's called 'Verifi Rights Data Alliance' (VRDA). We're focused on the data; it just happens to be that our solution has a small component of blockchain in it".

I then asked the informants about how blockchain can work for the consumer, and how blockchain can work on streaming services and platforms. Both informants were somewhat skeptical towards blockchain-based streaming. The informants answered the following:

Nic Garnett: *"I don't think it makes any difference. Most consumers just sign up for a subscription to one of the online services. If that's got a blockchain backend into it, I don't think that the consumer cares. (...) One of those things that you find in this technology space, is that you find the hundreds of people thinking about the next business venture. They're coming up with an idea that this is going to be perfectly free to the consumer, 100% of the revenue is going to go to the rightsholders, and they found a way of doing it. There are hundreds of these companies that come and go. (...) I've seen so many stories about blockchain companies coming and going, you never read about them going, but then you look for them and they've gone. (...) None of it is sustainable".*

Ken Umezaki: *"We as a company are not involved in consumer facing stuff. We're very focused on the B2B part. (...) Other companies that are working on or have worked on things like blockchain-backed streaming services, as one's called Audius. (...) The problem that I feel they all have is the general music consumption problem. Isn't it funny how everyone listens to what everyone else listens to? (...) We have a*

tremendously skewed consumption environment despite the fact that streaming is leveled it out, leveled the playing field a bit. It's still the case that the number one stream song versus the 100th stream song has somewhere between 10 and 50 times as many spins. That's in the top 100. We're talking about 80 million songs available on major streaming services (and growing), it's a huge tail. (...) That means that if you don't have that music on your consumer platform the chances of you scaling as a platform are smaller, not zero, but maybe significantly smaller. (...) They have to get this great content in. The only way you can get it is by getting licenses from the large music organizations that are relevant for that part of the content. They demand a lot to get access to this content. (...) So, if you're a startup, you can't really get there. It's a hard cycle to break. I don't think it comes purely from a technology innovation on the consumer side that's blockchain-based. In fact, the blockchain is very heavy. (...) I actually think that in traditional 'audio only' or 'audio and visual music consumption' space, blockchain is not a great fit for it. At least for the foreseeable future".

The topic of NFTs were originally not a part of the interview. However, both informants shared some interesting thoughts about NFTs, copyright, technical issues, and its future.

Nic Garnett: *"Indeed, yesterday I saw something where one of the big labels were saying "we are watching NFTs very carefully because we are very concerned that they're going to start infringing our rights". There I see that there is a big problem between exploiting NFTs and copyright. (...) There are issues with copyright law and blockchain, because insofar as blockchain makes possible something which is not permitted under copyright law, then you have a problem. NFTs presents a problem, because you're creating a value based on a copyrighted work, but it's not controlled by copyright. (...) What always amaze me in the music industry is that ultimately so little of it is about the music, it's about products. I suppose that because the music itself is available everywhere through streaming the people are trying to lock it down into products again. (...) In the case of an NFT they've got some kind of property right in something related to a piece of music that they like or admire, or they think other people do. (...) I think we will see a lot of activity around NFTs just as we saw three years ago with blockchain platforms. As we saw 20 years ago with DRM, they'll find their place, but it won't be major. (...) We'll have to wait to see whether NFTs is becoming a mainstream product within the industry".*

Ken Umezaki: *“You have examples of organizations trying to figure out the data limitation of a block, because there's actually a limit to how much you can actually store directly on the chain. That creates lots of issues if you can't store stuff. Most of the NFT world hasn't solved this problem yet. Because the image or the video is sitting over here somewhere, and it's hashed onto the chain. But then its hash disappears, or the hash gets hacked, all kinds of weird things happen, so it isn't actually a non-fungible asset, it's actually a fungible asset that happens to have a non-fungible connection to the chain. That's not really what we were promising. So, I think there's lots of things like that, that are being worked on now”.*

Furthermore, I asked Umezaki about his thoughts on how blockchain can affect the way music is monetized and how Verifi Media use it.

Ken Umezaki: *“Our thesis or our hypothesis is if we answer the question ‘who’ owns the rights to the song well in a systematic way and make that available to the clients and the broad music industry constituents, I guess we can help with the monetization piece. Again, it's not a blockchain thing, it actually is more about whether the data is comprehensive enough and that you cover enough geography. The other aspect of monetization, and I think this is where blockchain might work (still a might), is actually having a machine literate licensing protocol for music that is a broad licensing mechanic. (...).*

Now licensing is all about me letting you use the music for some period of time, for some set of uses, in some region. (...) So, I now have permissioned you to use music that I own for some period of time. That's very mechanizable as opposed to putting it in a paper contract only. A lot of these economic terms can actually be put into a computer or onto a network. And blockchain is really good at this, or could be really good at this, except it's really expensive to put individual transactions onto the chain. (...) I do believe that on the transaction related use cases associated with music monetization, the chain or similar technology tools could be, down the road, extremely valuable in streamlining this.

The other example I use, which is a little bit of a weird one, but let's say that you're in a game. (...) So, this idea of an ‘experiential-based’ licensing, and it's things that people are actually working on now. The best way to do that for the gamer or the gaming company is - they don't want or need to license the entire ‘Highway to hell’ song, they just need it for that little period of time, might just be the chorus or just the

guitar solo section - I call it 'micro licensing' or a 'use case specific licensing'. (...) Today, a constraint is that you have to license all the music (most of the time), the entirety of it. But what if we could only license 15 seconds of it? Well, the more granular it gets, the better data you need on the underlying music. You need to have better data on who owns it, and you have to be able to manage the licenses in a completely different way than we do today in the music industry. That's where I think the chain, as an example, can be extremely useful assuming we can find an efficient chain".

Thereafter, I asked Garnett about how blockchain will affect or change the way money is collected and distributed to rightsholders through labels, publishers and/or CMOs. Garnett is critical towards blockchain usage because it is largely dependent on industry wide adoption and good data quality.

Nic Garnett: *"The idea of blockchain is that it's precise and it's transparent and its sort of independently run. Therefore, you should get complete accuracy and complete transparency. (...) Insofar as labels, publishers and CMOs do not operate on the basis of complete transparency and accuracy, then blockchain will change that if they choose to apply it. They have the data systems which enable it to function. (...) Unless you got an industry wide system where everyone is operating together with common data standards and platforms, you're really not going to be able to make the best use of blockchain technology. (...) There are much better ways of doing data than what exist in the music industry at the moment, and blockchain is only as good as the data you put into it. The technology is only as good as what you put into it. And if your industry has not got the data system, because without the data systems blockchain is meaningless".*

I then asked the informants if they think that blockchain is an all-encompassing technology or if it can work side by side with traditional handling of licensing, meta-data handling and reports in the music industries. Furthermore, I added the following sub-question; Is it a stand-alone solution or can it support existing structures? Both informants think that blockchain can work alongside other technologies. They don't think that blockchain is an all-encompassing technology. This is what the informants said:

Nic Garnett: *"I think it can work side by side, because it does at the moment and there are blockchain systems out there. (...) What I do think you need is common data standards so that you know what's what. (...) So, I think it can exist alongside existing*

structures and I think it can be applied to improve existing structures, or more likely, it can be used to set up more efficient structures”.

Ken Umezaki: *“I think it has to be part of the stack. Like, it's not a ubiquitous solution. (...) The other thing that needs to happen for any kind of technology to be deployed properly is obvious; it's large-scale adoption. You can build the most amazing thing, but if no one is using it that matters, it doesn't really matter. We're unusual I think at Verifi, relative to other modern technology solutions for music data, because we do have large music industry companies as clients and partners. We have access to substantially all of their catalog, they're paying us, they've agreed to share data with other people, which is kind of new in the industry, because you get better data back. That's actually more than half the problem. I can go through a hackathon and come up with the perfect music licensing module in a weekend that's blockchain-based. But is anyone going to use it? Don't you need to get enough people to use it so that you get credibility around it being something that's useful. Those are actually to me the real business dilemma ultimately. That's what leads to getting something to work”.*

I then asked Umezaki to further elaborate on blockchain adaptation. I asked him what he thinks are the obstacles for adaptation in the music industries? Umezaki thinks that much of the problem is that the industry still has to adapt to the digital ecosystem and become more data literate.

Ken Umezaki: *“Let's not forget that digital is new to the music business in terms of really being the dominant monetization mechanism for the recorded music business. (...) So, there's a little bit of just catch-up time almost and sort of mindset shift that needs to happen. (...) The last piece, back to my data literacy, I think organizations need to be better aligned with having data literate people in decision making positions within organizations and in larger organizations in particular. The reason why we focused on the “big boys and girls”, as I call it, is getting them to actually say yes to our value proposition is what's going to drive our ability to keep growing as a company with medium sized organizations etc. It's a very top-heavy industry, you know. Top three labels control around 60% of the content still, and they're very good at it, and they're very important, and they will be that way for a long time despite what other people might say. So, they're not going away. But without them it's harder to get at the indie organizations and there's many of those”.*

I then asked Garnett to share his thoughts on the future of the music industries and blockchain technology. I asked him about where he think the music industries will be in ten years, and if blockchain plays a part in that future.

Nic Garnett: *“I don't think so. I think it will go on in the next 10 years. I think we have more or less plateaued now. I think we will just see streaming becoming 85-90% of the business of music distribution in most parts of the world. If the industry can get its data stuff together, it will become more efficient. What are the prospects of it doing that? I don't think they're great in the short term. Yes, there will be stand-alone blockchain systems. Will there become a single unified blockchain system? I don't think so. Will there be a framework for creating interoperability between different blockchain music platforms? I doubt it. Are the big online music services going to start using it? Is Spotify, Apple Music, YouTube, Amazon Music going to use it? They are the key players in the future of music. (...) I think that there will be big changes in rights management in the coming years, it's on the way already. (...) I go back to DRM 20 years ago when everybody thought DRM was going to revolutionize the music industry across the board. It didn't. But it's still there, DRM. We use DRM every day. (...) Digital Rights Management is there, but it's a small part, a key part - but it's a hidden part of a much bigger model. I think probably what we're going to see is that blockchain technologies will do different jobs. Will it revolutionize the whole structure of the music industry? I don't think so. (...) I think it's good to know about blockchain because it's the technology system that will be used in different parts of the industry. But I don't think it's going to define the music industry”.*

5.2 Findings from data collection

5.2.1 Current blockchain initiatives in the music industries

In the past decade there has emerged a large number of new companies that wishes to either build on or implement blockchain technology in their business models and systems. There are currently a lot of blockchain-based companies, but I’ve found those that I see the most relevance in. I will in this part of the research take a look at some of the companies that uses blockchain as a tool or as a business model. Some of which are already large while some are relatively new but with interesting ideas and business models.

Mycelia

Mycelia is a platform established by the artist Imogen Heap. Heap tells in an interview with Sitra that Mycelia was created out of frustration regarding the current structure of the music industries. Primarily, Heaps concerns are related to the copyright system and the collecting and distribution of royalties. She criticizes the way that data is collected and the issues the current systems have when it comes to artist payments. Mycelia was then created to ensure that artists and creators can more easily claim the royalties they are owed (Härkönen, 2019, December 13). The mission for Mycelia is to create a new ecosystem for the music industries where ethical and fair values towards artists and creators are central. They aim to create a sustainable platform with high ethical and technical standards that can provide the music industries with increasing innovation and an ecosystem where rights are acknowledge. Mycelia is based on the Ethereum blockchain and uses a public blockchain with integrated smart contracts (Lyons et al., 2019, p. 114). Heap claims that smart contracts are the key solution to simplifying the complexity of the current structures in the music industries, and hence, eliminate confusion and fragmentation of rights and critical features (Tapscott & Tapscott, 2016, p. 231).

Heap argues that blockchain technology and Mycelia can help artists move center stage instead of sitting on the sideline. She claims that artists can use Mycelia to get a larger piece of the pie by maximizing the value of their rights related to their artistic work and hence get a fair value for their work. In the Mycelia scenario, blockchain technology will get rid of the big, greedy intermedia, and give more power to the artists. Hence, in this scenario, artistic rights and livelihood is more balanced than it is arguably in the current ecosystem. (Tapscott & Tapscott, 2016, p. 227).

Mycelia has created a feature which they call *the creative passport*. The creative passport was created to function as a digital identity ID for creators where they can access, update, and manage information related to their work and their artistic profile. The idea is to simplify the process and the storage of the artist's data. The creative passport enables artists to have all data and information available at one place. Furthermore, music makers can easily connect other representatives such as managers, labels, publishers, CMOs, etc. to their creative passport so that they can collect necessary data from one place. (The Creative Passport, 2018).

Musicoin

Musicoin is a blockchain-based music streaming platform which aims to ‘support creation, distribution and consumption of music in a shared ecosystem’. The use of the platform is free for the consumer, and they have the opportunity to support independent artists and musicians. Through the platform, Musicoin claims that creators will be paid more fairly compared to other major and mainstream streaming services such as Spotify and Apple Music. The reason for this is that the service uses a peer-to-peer based blockchain network that ensures that transactions are transparent and secure. Hence, Musicoin does not use third-party companies for the collection and distribution of royalties, and therefore artists can collect 100% of the generated revenue. (Lyons et al., 2019, p. 115).

In order for Musicoin to both provide a free streaming service to the consumers without ads and a platform which also pays better rates to artists, they use a Universal Basic Income (UBI) economic model. The UBI model ensures that all contributors are rewarded accordingly to their contribution. Musicoin therefore creates a money pool to ensure that artists and musicians can be paid fairly. Musicoin has created their own global currency that can be used for transactions in music and music-related affairs. The currency is called ‘MUSIC’, and through Musicoin’s smart contracts which builds on the Pay-Per-Play (PPP) model, artists and musicians will be compensated immediately with ‘MUSIC’ when their music is streamed. Musicoin also provides the platform users to tip creators with ‘MUSIC’, and they will in the future integrate the possibility of paid downloads and sales of merchandize on their platform. (Lyons et al., 2019, p. 115).

AUDIUS

Audius is a blockchain-based online streaming service that aims to connect the audience with artists and creators, as well as exclusive releases and content. The platform provides the artists the opportunity to choose their own streaming rate and be able to collect data about their superfans. They use a 90 -10 revenue distribution model where 10% goes to Audius and 90% goes to creators and rightsholders. Since their launch in 2019, they now have 1.2 million users and 50k content providers (per 2021). Currently Audius host around 450k tracks. (Jones, 2021).

Audius aim to empower the artists, and hence, they’re not built to profit from their service, unlike other traditional streaming services. Therefore, investors are not investing in the company, but rather in the platform’s token which is called \$AUDIO. The platform token is

staked by node operators and provides security, governance and feature access for artists, curators, and node operators (Rumburg, Sethi & Nagaraj, 2020, p. 4).

Open Music Initiative (OMI)

Open Music Initiative (OMI) is a non-profit organization that emerged from a collaboration between Berklee College of Music and MIT and was launched in 2016. Their mission was primarily to educate creators about intellectual property rights, to advance the protocol standards, and to promote innovation in the music industries. OMI has a large basket of both major and smaller members from several different industries. These members include Sony, Warner Music, YouTube, Spotify, Facebook (Meta), Intel, Netflix, Soundcloud, Red Bull Media, SESAC, SiriusXM, and many more. Their goal is to provide an ecosystem where artists are paid fairly through a system where advanced technologies work to identify and match artistic works with its creator(s). These technologies include blockchain, artificial intelligence and machine learning. (Open Music Initiative, 2022).

All web-based services and platforms today uses a standard Application Programming Interfaces (API) and protocols. However, when using common APIs and protocols it becomes difficult for new innovations. Therefore, OMI has created an open-source software where innovation can flourish and where data can be stored, shared, and exchanged more efficiently. When using an open-source software anyone can contribute to the system. Hence, OMI can through their new API and protocols be sufficient with traditional standards as well as being able to create new standards. Together the system will be able to identify and track music rights and its rightsholders. OMI uses blockchain technology to manage and authenticate transactions. Blockchain is also used to link the ISRC and the ISWC, which has been an issue in the digital age (as discussed in chapter 3). Blockchain technology will provide OMI with lower costs through smart contracts. As mentioned previously, other technologies such as AI and machine learning is used by OMI to ensure high standard analytics and reduced cost structures. (Open Music Initiative, 2022).

Blockur

Blockur is a UK-based company whose mission is to maximize the creator's royalties from online platforms. In order for Blockur to achieve their goal, they use blockchain technology and AI to collect, store and analyze data so that the process becomes cheaper and generates more revenue for creators and rightsholders. Blockur is mainly used by music publishers and CMOs globally, and they claim that 70% of the global music publishers are linked to them. Through Blockur's platform interface, music publishers and CMOs can explore and analyze

the usage of their catalogue. Blockur is one of the members of Open Music Initiative (OMI), and Blockur uses OMI's API and protocol system as an important industry standard in their service. (Lyons et al., 2019, p. 117).

SIAE

SIAE is a collecting society for authors and publishers in Italy and were founded in 1882. They are a CMO that monetize, collect, and distribute copyright revenue to rightsholders. According to CISAC, SIAE is ranking as the sixth largest worldwide collecting society, licensing up to 1.2 million licenses every year on behalf of their members. Since 2019 SIAE has collaborated with blockchain technology company Algorand to develop a new ecosystem for copyright management. Through Algorand, SIAE has launched over 4 million NFTs. These NFTs represents digital music rights on behalf of over 95,000+ creators associated to their company. SIAE has a goal to create a new ecosystem where the creator's rights are well protected in the digital age by making the authors rights into digital assets. They believe that by transferring digital rights to a decentralized and transparent public blockchain is the solution for a sustainable and fair copyright structure going forward. (Algorand, 2021).

Verifi Media

Verifi Media is a company that develops right management solutions for both small independent companies and large enterprises. Verifi Media has an alliance with Warner Music Group, Warner/Chappell, Deezer, Unison Rights and FUGA. These companies work together through Verifi's services to enhance, collaborate, and share music rights data to improve all of their businesses. Verifi Media uses a number of different technologies to verify ownership and data. These technologies include cloud computing, artificial intelligence, watermarking and blockchain technology. Verifi Media describes themselves as: *a multi-party rights management services company anchored by enterprise blockchain technology, ensuring data privacy and sovereignty remains intact as data is shared across the supply chain.* (Verifi Media, 2022).

5.2.2 Non-Fungible Tokens

NFTs is one of the blockchain based features that has been most commonly adapted into the music industries in recent years. NFTs allow artists to directly benefit and profit from sales and royalties from future sales of their own NFTs. Artists have tools at hand to independently create and distribute their NFTs online through various cryptocurrency and/or NFT exchanges. Most commonly in the music industry, the NFTs will contain copyrights that can

be sold to fans or to the highest bidder. However, NFTs can also include artist art, physical and/or virtual concert and event benefits. Because the artists most likely is the creator of the NFT, the artist can collect revenue from the revenue generated from future sales of the NFTs.

Opulous

Opulous is a platform that specializes in the usage of NFTs for music artists and other music industry companies. They launch copyright backed NFTs which provides the buyers with monthly royalty earnings, and in some cases other rewards such as concert tickets, backstage passes, merchandize, and other experiences and benefits. The value of the NFT can increase due to positive progress of the artist that the NFT represents. Opulous will collect and distribute the revenue that is generated from music platforms such as Spotify, Apple Music and Amazon Music, to the holders of the NFTs that are owed royalties. (Opulous, 2022).

Opulous is based on the Ethereum blockchain because it is the largest platform for NFTs today and therefore has the most liquidity and accessibility. Opulous also offers DeFi loans that can be used to finance new projects. The DeFi loans were created because they observed that most artists and musicians struggle to get loans from traditional banks or other funding services. The DeFi loans are based on the Algorand blockchain because of its PoS consensus mechanism that provides security, efficiency, and scalability. (Opulous, 2022).

Coachella enters NFTs

Nevertheless, besides artists, other music industry businesses have taken NFTs into their business models. For instance, one of the largest and most popular music festivals in the world, Coachella, has moved into the NFT universe in collaboration with the cryptocurrency exchange FTX. Together, Coachella and FTX are building a digital marketplace for digital collectibles in the form of NFTs. The crown NFT in the Coachella marketplace is the lifetime festival passes that includes front row VIP tickets, on-stage access, celebrity dinner, and unlimited access to virtual Coachella experiences. The blockchain network used for the Coachella NFTs minting is the Solana blockchain. The reason why FTX chose this particular blockchain for minting is because of the low fees it provides as well as its PoS consensus mechanism. The partnership between Coachella and FTX is a significant event where, for the first time, a major music industry profile has used NFTs as a central tool in their promotion and ticketing. The Coachella and FTX partnership might provide us with a look into what the future of both physical and virtual music experience ticketing might look like. (Schonberger, 2022).

“We’re always working on ways to engage our international and at-home audiences to make them feel like they’re a part of Coachella, even if they’re not at the festival. As the metaverse continues to develop, we will create more opportunities for fans to have fun and interact with each other and their favorite artists both online and offline,” said Sam Schoonover, Innovation Lead for Coachella. (Schonberger, 2022).

Bob Dylan NFTs and Snowcrash

“With Snowcrash, we have found a perfect opportunity where the entertainment community, Silicon Valley and Wall Street all come together to create opportunities for artists and organizations impacting the world today”. Walter De Brouwer (Stassen, 2022).

Copyright and music royalty investing has been increasing significantly in the past several years for banks, private equity and other companies who wish to invest in music as an asset (Stone, 2022). Most commonly companies will buy music rights and earn royalties from it over time in a traditional fashion. However, as presented in this chapter, more people and investors turn their attention towards NFTs. For example, in the past several years Universal Music Group and Sony Music Group has bought up the rights of Bob Dylan’s music. The cost has been estimated to be over half billion dollars, where Universal bought Dylan’s catalogue for close to \$400 million and Sony bought Dylan’s recording rights for close to \$150 million. However, instead of sitting on traditional music rights, Universal and Sony are turning the music rights of Bob Dylan into NFTs through the new platform Snowcrash which was launched as a collaboration between UMG and Sony. On Snowcrash Web 3.0 and Metaverse is central technologies and aims to move machines to the center while leaving humans on the edge. Snowcrash is running on the Solana blockchain because of their environmental awareness and has a partnership with the crypto exchange FTX. The platform aims to build a sustainable and accessible marketplace for both artists and fans to experience and embrace, not only for music artists and fans, but across a wide range of creative industries and related industries. Later this year it will be possible to buy music rights from Bob Dylan, Miles Davis, and more on the Snowcrash platform. (Stassen, 2022).

Chapter 6

Discussion

In this chapter I will discuss the findings presented in the previous chapter. The findings will be further linked and discussed related to the theoretical literature and practical concepts presented in chapter 2 and 3. I will be analyzing the data gathered from the informants and look at it from different perspectives related to other data collection and topics and issues from previous chapters.

6.1 Blockchain technology inverted

“All I want to know is where I’m going to die, so I’ll never go there”. (Charlie Munger referred to by Farnam Street Media, 2022).

Charlie Munger, vice-chairman of Warren Buffett's Berkshire Hathaway and arguably one of the greatest investors in modern history, has frequently talked about the importance of inverting a case. In his case, when looking at a potential investment he would look at the fundamentals in the company's financials and their business models in order to predict future earnings, because every investment is the value of all future cashflow. If he likes the company's fundamentals he would precede in further due diligence. In this process, Munger claims that most people would be very excited about the company if what they find is to their liking, and hence, they become ignorant to potential flaws in the company. Therefore, Munger always inverts the investment case and asks himself what reasons there are that the case is a bad investment (Farnam Street Media, 2022). I find this method very useful when looking at blockchains future adoption possibilities in the music industries.

In my research I have read and gathered a lot of information about blockchain technology, and the view around blockchain varies. Some claim that it's a 'one shoot fix all' solution, while others look at it as a useful tool that can work alongside existing structures. However, there are more obstacles and issues along the way for the interpretation of blockchain in the music industries. Further, I will invert blockchain technology and look at issues and challenges that might have significant impacts and/or implications for its use in the music industries.

6.1.1 Technology cost and climate issues

The first issue I want to take into account, is that blockchain technology can be very energy inefficient and requires tremendous amount of energy (Sarmah, 2018, p. 25; Hayes, 2022). However, much of this discussion can differ when considering the different types of blockchains and their representative consensus mechanism. The primary issue portrayed in the media is the PoW consensus mechanism and mining stations (Swan, 2015, p. 84). This is an important issue that both Garnett and Umezaki addressed in their interviews.

Crypto mining stations using PoW consensus mechanisms have received a large amount of criticism related to its high energy consumption. Because Bitcoin is the largest crypto on the market using PoW consensus, it has been the face of the criticism, nevertheless, with good reason. The University of Cambridge posted an Index on their websites called “Cambridge Bitcoin Electricity Consumption Index”. The Index shows that Bitcoin uses 148,5 TWh on an annual basis. That’s almost as much energy as both Norway (124,3 TWh per year) and Ukraine (124,5 TWh per year) uses annually. That’s enough to supply the total electricity of the University of Cambridge for 1085 years. (University of Cambridge, 2022).

Nonetheless, we are seeing a positive trend where large blockchain platforms such as Ethereum are switching their consensus mechanism from PoW to PoS. This change alone will have significant meaning and notable change in energy consumption and efficiency for its blockchain platform (Hayes, 2022). Besides the positive change on the blockchain platforms, we also see more climate awareness from new blockchain users, such as Coachella, Snowcrash, and other blockchain initiatives in the music industries, who intentionally chose to use energy efficient blockchain platforms such as Solana and Ethereum 2.0 (Schonberger, 2022).

Additionally, another positive trend was found in President Biden’s executive order for digital assets where there was a clear awareness about climate risks related to the development of digital assets. The order aims to reduce negative climate impacts from the development and innovation regarding digital assets. (The White House, 2022). Nevertheless, the global climate environment is moving more towards green and sustainable energy sources. This raises the question: does green and renewable energy have the capacity to provide blockchain technology with sufficient energy? This question is out of scope for the purpose of this research. However, it’s important to mention and take into consideration for future research.

6.1.2 Speed and data inefficiency

One of the most important characteristics of blockchain platforms is their speed and data efficiency. While some platforms have become significantly efficient, others are slow and inefficient in comparison. As presented in chapter 2, one important feature for a blockchain platform is their Transactions-Per-Second (TPS). Currently bitcoin has a TPS of 7 and Ethereum has a TPS of 30. Compared to Visa's 65,000 TPS, neither Bitcoin nor Ethereum are able to compete with them. However, Ethereum are planning to launch Ethereum 2.0 which will run on a PoS system instead of PoW. Hence, because of the efficient PoS consensus mechanism, Ethereum 2.0 should be able to handle up to 100,000 TPS (Hayes, 2022). While the TPS change would be significant, it's still questionable how scalable these cryptocurrencies are and whether it's lucrative for corporations to switch from traditional systems to blockchain.

One of the most common issues debated around the scalability of these cryptocurrencies are the limitations per block on the blockchain. This is an issue that both Garnett and Umezaki addressed in their interviews. The issue is that the blocks that are created on the blockchain has a limitation of how much data the block is capable of storing. Therefore, the block limit promotes and motivate the use of centralized databases. This is a current issue that probably will have significant impacts on the diversified use and scalability of blockchain technology in various industries moving forward.

One of Garnett's concerns that he accessed in his interview, was that the music industry has a huge data problem. He claims that the music industry doesn't have its data act together. He points to the coding systems (ISRC and ISWC) and explains how they don't do what they're supposed to do, and that it doesn't seem to be any effort to clean up the mess. Garnett then further draws the line to how blockchain technology fits into this data problem, and he stats:

“Many of these blockchain initiatives I've seen in the music industry start with the idea that ‘the music industry has so many problems with its data, we can solve that with blockchain’. Unfortunately, you can't, because blockchain is only as good as the data you put into it. The blockchain itself doesn't solve the data problem”.

So, if that assumption is correct and the underlying data is fluid, unstable, or unreliable, blockchain could end up having the opposite effect of fixing it all, it could end up messing things up to an even greater degree. Umezaki shares the same view as Garnett when it comes to low-quality data in the music industry. Umezaki has a background in finance, and he

claims that their data quality is a 9/10. However, he further said that the music industry is currently a 2/10 in data quality. Hence, there is a significant difference which he claims shouldn't be too difficult to change. According to Umezaki, the biggest issue with the current data is that there are data gaps all over the place. Umezaki explained that through their Verifi platform, by allowing companies to share data, they can in collaboration fill the gaps. He claims that they have (or close to) brought the data quality from a 2/10 to a 4/10 for the companies involved in their system.

6.1.3 Illegal activity and regulations

As discussed in this thesis, blockchain technology has been famously renowned for its security from hackers and from manipulation, which is true. However, there are some issues with illegal activity and trading on the blockchain. Through the dark web people have the opportunity to buy and sell illegal goods without being traced. Through the dark web there has been detected illegal cryptocurrency transactions. Hence, financial service providers who offers crypto exchange has been required to gather identity information that does not link to illegal activities and organizations (Hayes, 2022). Because there is lack of regulation and legislation from the US and the EU (for example), the use of digital assets is subject for financial instability, market manipulation and financial crime, which has been the case in the Ukraine – Russian war (European Parliament, 2022). This topic is out of scope for this thesis, so I will not go in further detail. However, it's worth mentioning and take into consideration when discussing the broader picture for blockchain usage.

6.1.4 Scalability issues and blockchain as business model

Another significant issue that needs to be addressed, is that over the past years there have been instances of scalability issues with new blockchain-based companies in the music industries. The source of this issue might differ in different cases. In some cases, it can be a technical issue where the blockchain technology itself doesn't have the required capacity, or it can be industrial issues where the industry works against the company's vision. In Garnett's interview, he addressed this issue. Garnett pointed out that there has been a large number of blockchain-based start-up companies that had a wonderful vision that was hyped up. However, after the hype, you never hear about them shutting down. Garnett claims that he saw it 3-4 years ago with blockchain-based companies, and now he sees it with NFT-based companies. Umezaki further elaborates on blockchain-based companies and how they are struggling to scale their business. He claims that blockchain isn't a 'one solution fix all' tool,

and therefore, it's not a comprehensive solution to every use case. He further explains that 'enterprise blockchain use case' is an attempt people use to implement blockchain at scale. However, Umezaki claims that it hasn't happened yet. He said: *"no one actually found a great home for data centric blockchain use where a supermajority of the technology is actually the chain"*.

One such blockchain-based start-up company that failed to establish themselves in the industry was Jaak. Jaak was one of the first companies that tried to establish blockchain technology in the music industry back in 2017. They had good partnership with companies such as WMG, Warner/Chappell and BMG. Nevertheless, they failed to keep up with the changes in the market, and hence, they were unable to scale their model into the music market. The founder and CEO, Vaughn McKenzie-Landell, claimed that even though the blockchain business failed, he can see great future potential in the blockchain and NFT space in the music industry, because it has been further integrated in common people's lives. (Dredge, 2021).

Garnett further explains in his interview that he sees a resemblance between blockchain-based startup companies that emerged several years ago and new NFT-based startup companies that emerge today. He explains that NFT-based companies are the new blockchain-based companies because they are following the market hype. Unfortunately, just like the blockchain-based startups, some of the NFT startups will survive and most will not, he claims. Nevertheless, Garnett further shares his views on the future of the NFT space: *"they'll find their place, but it won't be major"*. Umezaki shares Garnett's view and further claims this about blockchain: *"it's still an emerging technology, it's a useful tool for some things, but not everything. You do need to understand it well to know the pros and cons and try to evaluate what the most effective deployment is or whether you should deploy it at all"*.

If Umezaki's perspective is correct, it's important for companies to consider and understand what blockchain deployment would mean to them. Important deployment factors to consider would be technology cost compared to traditional digital services, energy consumption, and how it would impact their business model.

6.1.5 Competing technologies

It is also important to understand that blockchain technology isn't the only new big thing within the new technologies space. Both Garnett and Umezaki stated in their interviews that it doesn't seem like blockchain can be capable of being 'THE solution' for all the issues. Just

like Umezaki's company Verifi Media, and others such as OMI, Blockur, etc., uses blockchain as part of a grand model of multiple technologies. These technologies include, Artificial Intelligence (AI), cloud computing, watermarking, and more. These technologies can both work along-side blockchain and/or perhaps, compete with blockchain. Through an email after his interview, Umezaki shared with me some additional technologies that can be alternative to blockchain. He wrote that both QLDB from AWS, and the newly emerging DAG tech, can be useful when it comes to handling music data. It is important to mention these alternative and additional technologies, but in order to delimit my research I will not address these technologies in further detail.

6.1.6 Geopolitics and regulations

When discussing blockchain technology, cryptocurrencies and NFTs, it is important to understand that it's part of a broader picture that is formed by domestic and global politics and regulations. In March this year, President Biden signed an order that can establish a framework for digital assets and its underlying technology. This framework is supposed to include consumer and investor protection, financial stability, promoting US leadership in the global financial system, and responsible innovation. While this has received some criticism, others recognize that this is a positive factor for blockchain-based companies, crypto and miners. With this framework, the US seeks to promote digital assets, and hence, make it more adoptable for institutions and corporations who previously has been unwilling to adopt it because of the lack of regulations (The White House, 2022). This is a positive turn when compared to China's regulations which aims to turn down digital asset innovation by shutting down miners. (Islam, 2022).

Similarly, the European Parliament has recognized that crypto and blockchain has proven to be both promising and problematic. Therefore, the EU wants to promote the use and development of these technologies, but at the same time protect the users. However, currently, users who use digital assets are not protected under EU legislation, and hence, together with lack of regulation, it creates a usage risk. Nevertheless, the EU Parliament are currently working on regulations that are now being negotiated in different EU countries to shape the final structures of the rules. The benefit of these EU rules is that it will create more secure framework for users, and it will more likely limit the possibility for illegal activity with digital assets. (European Parliament, 2022).

The recent war between Russia and Ukraine has also provided new views on digital assets on government level. When western governments placed economic sanctions on Russia during the start of the war, the Russian Fiat currency RUB suffered severely. Hence, both Russia and Ukraine had an increasing amount of digital assets applications. This is because while standard Fiat currencies can be easily manipulated by foreign governments and geopolitical events, digital assets can have less currency devaluation from geopolitical events. However, digital assets can be affected by macroeconomic factors, however, allegedly not at the same level as Fiat currencies. (Islam, 2022).

Furthermore, besides domestic, and geopolitical regulations, there are some countries where bitcoin has been adopted as official currencies. Per date, there are two countries who have done this; El Salvador and the Central African Republic. However, bitcoin will still work side by side with their traditional Fiat currencies. This move has received praise in the crypto communities around the world and is hyped to be the step towards crypto as a mainstream, global currency. However, these countries have received criticism both globally and locally for using bitcoin as an official currency because of its volatile nature. (Browne, 2022).

6.2 The future of blockchain in the music industries

Lyons et al (2019, p. 118) argues that the use of blockchain technology in the music industries would not only be a technological change but rather a fundamental business change. In order to implement blockchain truly and completely there would be a complete and complex shift for every music industry sector, and it would have significant impacts on everyone.

Nevertheless, in chapter 5.2 I presented a number of companies who works with blockchain technology in different ways. While some of them uses blockchain as a fundament in their business model, others simply use blockchain technology as a technological tool amongst a number of other technologies. Using the data that I have gathered about current blockchain initiatives, data from the conducted interviews, and from other literature outputs, I will look at what the future of blockchain in the music industries might look like.

6.2.1 Copyright

In this part I will take a closer look at how blockchain technology and NFTs work with traditional copyright structures. I will divide the discussion into separate sections because they each presents different copyright implications.

6.2.1.1 Blockchain technology and copyright law

As presented previously in my thesis, creators and rightsholders can publish their works on a blockchain-based system which allows them to securely record ownerships and sign smart contracts to license the use of their works (Tschmuck, 2017, p. 187; Wikström, 2020, p. 112). This way blockchain technology is meant to reduce market friction, to increase licensing efficiency and creators' autonomy. Both Giannopoulou et al. (2021) and Garnett (in his interview) compared this blockchain characteristics to what the DRM technology promised 20 years ago. However, blockchain technology is facing many of the same copyright problems today that DRM faced back then. Blockchain technology is supposed to offer borderless, standardized, impersonal and automated solutions. However, Giannopoulou et al. (2021) claims that the challenges with blockchain solutions is that it becomes difficult to reconcile the fragmentation of copyright laws.

As mentioned, there were many blockchain-based systems that were launched during the 2017 blockchain hype, including JAAK and Mycelia which has been presented previously. While some disappeared over the years, some are still around but cannot be recognized as successful according to Giannopoulou et al. (2021). Giannopoulou claims that blockchain technology is great for handling metadata in a scalable and transparent manner. However, the technology becomes useless if high-quality metadata isn't ensured, which he claims that the copyright space of the industry can't provide. Again, this takes me back to Garnett's statement; *"blockchain is only as good as the data you put into it. The blockchain itself doesn't solve the data problem"*. Hence, many blockchain-based copyright systems suffer from poor metadata quality which Giannopoulou claims is an industrial issue rather than a technological issue (Giannopoulou et al., 2021).

Furthermore, Garnett pointed out the following: *"I don't think that there is any fundamental obstacle in either the civil law system of what we call 'authors rights', and the 'common law system' of copyright, to prevent the use of blockchain technology"*. Umezaki's view is that, because of the data gaps in the industry, there must be a *"rigorous data service or hub that the industry can actually draw upon to understand 'who owns it' and 'whether or not the thing's licensed'"*. Therefore, Umezaki claims that *"we got to make that question answerable systematically"*. Therefore, he said if you can't do that, it doesn't matter what type of technology you use. Hence, Umezaki think that blockchain can be a useful tool in music data management, but it isn't going to be 'THE solution' to the music industry's data and rights issues. However, Garnett later in the interview followed up on this with an additional

statement saying; “*there are issues with copyright law and blockchain, because insofar as blockchain makes possible something which is not permitted under copyright law, then you have a problem*”. The latter statement shows most significance when discussing NFTs.

6.2.1.2 NFTs and copyright law

When it comes to NFTs and copyright law, it needs to be discussed separately. NFTs can provide the music industries with great opportunities in theory. However, in many cases, because of the technical structure and digital distribution of NFTs, they don’t work well with traditional copyright law and structures according to some scholars. According to Giannopoulou et al. (2021) there are two main issues with NFTs and copyright law. They focus their discussion on 1) ownership, digital exhaustion, and resale; and 2) Collective Management Organizations (CMOs).

Firstly, because of the digital nature of NFTs, they don’t go well with existing structures and conceptions. Hence, this generates implications with the transfer of copyright ownership since the NFT owner or seller does not necessarily own the underlying digital work. Therefore, NFTs has been subject of copyfraud where either public domain works and/or protected works has been subject of unauthorized tokenization (Giannopoulou et al., 2021). Garnett mentioned that some record labels are reluctant towards NFTs because of this reason; people might infringe their rights through unauthorized tokenization. Secondly, when someone buys an NFT they only receive a quasi-ownership interest in information and/or metadata that is linked to copyright-protected works. However, because they only own a unique version of the work, the work can still be used on digital platforms and services without infringing the rights of the NFT owner. Thirdly, when it comes to resale and distribution of NFTs, copyright laws (EU laws of instance) do not cover the rights of distribution and digital exhaustion because these laws require and only apply to tangible objects. Because an NFT is a digital representation of a digital work (most of the time), copyright laws cannot always protect its rights. (Giannopoulou et al., 2021). Garnett shares some of the same concerns as Giannopoulou when it comes to NFTs and copyright. Garnett stated that “*NFTs presents problems, because you're creating a value based on a copyright work, but it's not controlled by copyright*”.

When blockchain-based systems first started to emerge several years ago, there was an interest for the technology in collecting societies (Lyons et al, 2019, p. 118). This was because the technology could theoretically decentralize databases of metadata linked to

musical works and give the CMOs real-time updates and tracking possibilities, as well as more efficiently link their current standard codes ISRC and ISWC. Nevertheless, even though there were many interesting initiatives of blockchain-based copyright systems, CMOs seem to have lost interest in the technology, and hence, few significant adaptations have been made. Of the few initiatives that were made, SIAE's NFT adaptation is perhaps the most notable one which was presented in chapter 5.2. However, I haven't been able to find evidence of the effects of SIAE's NFT adaptation. Hence, it's difficult to say if it made any difference for the CMO and the rightsholders.

An additional issue related to NFTs and copyright which is worth mentioning is that NFTs make catalogue investing more accessible for both public and private people or corporations. This presents us with two issues; 1) rights and ownership will be further fragmented across a larger group of rightsholders, and 2) the industry will most likely be subject to further catalogue investing by private equity and perhaps unwanted owners. Nordgård (2018, p. 16) explains that if rights get too fragmented, investors and companies will lose interest if they need to work with too many copyrights. This is an issue that NFTs certainly provides the music industries.

6.2.2 Streaming

One of Garnett's views on the most pressing issues in the current music industry environment was how the industry has evolved into streaming. He explains how the business model has moved from being a sales model to being a rental model. He explains that "*there are limits for the revenue it can generate in the sense that it's a rental model. There's only so many renters out there, whereas with the sales model, you always have the opportunity of massive sales on a particular title, which isn't really there in streaming cause everybody pays the same price for everything*". He further expresses his concerns about how the current model will be unable to grow recorded music much more and how music has lost much of its value.

Later in the interview Garnett discussed where blockchain could be used in the digital music industry. Garnett then points out that blockchain could probably be used to manage data from streaming. However, Garnett recognizes that in order to adopt a blockchain system into streaming, you would need a tremendous amount of work across the industry. That becomes difficult because of the industry's fragmented structure and all the different blocks of interest. He then concludes that: "*They're all fighting for their lives. Often that fight involves a lot of*

resistance to change. In theory, again, blockchain could be useful but I don't see it happening across the board”.

However, if we look at some of the blockchain initiatives that was mentioned in chapter 5.2, we find some potential solutions to some of the issues mentioned. First, blockchain-based streaming services such as Musicoin claims that they can provide a free service for the consumer whilst being able to give artists 100% of royalties using their own crypto ‘MUSIC’. The royalties are generated through the miners, and a share of the coin profit goes into a UBI pool which again is distributed fairly amongst the artists on the platform based on a PPP model (Lyons et al., 2019, p. 115). Additionally, the other blockchain-based streaming service Audius can provide 90% of royalties to artists, and they can choose their streaming rates themselves (Jones, 2021). They don’t aim to profit from streaming, and hence, they differ from many other traditional- and other blockchain-based streaming services. Even though these models sound lucrative, the question then is: is these sustainable business models? How long can mining and staking be able to generate a substantial income for artist royalties? Is it really necessary that streaming becomes free for the consumers? Is that really what the industry wants? Garnett is clear in his statements saying that music has already lost much of its value, so why should it be free? He further claims that it’s not what the industry wants and that these types of business models are not sustainable in the long run.

Some of the other initiatives that was presented is focusing on rights management and are using blockchain technology as a tool to ensure better data management quality and efficiency. These companies include OMI, Blockur and Verifi Media, all of which uses blockchain side by side with other innovative technologies. Hence, blockchain is simply used as an additional engineering tool in a wider and more complex structure and also work alongside traditional structures (Open Music Initiative, 2022; Verifi Media, 2022). While these companies work with rights management on a broader basis, they have a relevance in the handling of data from streaming. For instance, OMI aims to provide artists with better rates using a basket of advanced technologies to identify and match artistic works. In that case blockchain is used in the OMI system to link ISRC and ISWC, as well as using it to manage and authenticate transactions (Open Music Initiative, 2022).

However, it is difficult to see how and where blockchain technology can find its place in the streaming space. There are a couple of reasons why. First, in order of blockchain-based streaming services to be successful, they’ll need to have a model that have the potential to become mainstream. For that to happen they would both be able to compete with the

traditional streaming services and they would need trust and support from major record labels and publishers in order to represent the same catalogue. As Garnett claimed it, the industry is very conservative and reluctant to change. So, Garnett does not see that happening. According to Umezaki, the problem with blockchain-based streaming services is grounded in general music consumption, because most people listen to what everyone else's listening to. Hence, these streaming platforms need to have the same catalogue as their competitors, and they need to get that licensed from the major music companies – which is easier said than done. Second, the industry needs their data act together in order for blockchain to be useful. Data management has become fragmented over the years, and hence, it has become difficult to handle considering all the bad data that's currently floating around data systems. Hence, even though OMI uses blockchain to link ISRC and ISWC it doesn't necessarily mean that the data they collect is of higher quality. Again, I find myself going back to Garnett's quote:

“blockchain is only as good as the data you put into it. The blockchain itself doesn't solve the data problem”. Umezaki concludes his thoughts about blockchain and streaming as such: *“I actually think that in traditional ‘audio only’ or ‘audio and visual music consumption’ space, blockchain is not a great fit for it. At least for the foreseeable future”*.

6.2.3 Record labels, Publishers, and Artists

Record labels have an important part in the music industry and has a lot of power and control over how things are done and how music industry structures are set (Wikström, 2020, p. 80; Tschmuck, 2017, p. 112-113). When it comes to record labels and blockchain-based solutions, Garnett had some thoughts around record labels and new technologies. He spoke about DRM technologies in Intertrust 20 years ago when they had a management meeting where they said that: *“this is great for the record labels. They'll be able to figure out how much they owe their performers and composers in real time”*. I said *“you must be mad. They want to sit on that money that they owe them for as long as possible”*. They make money from that latency in the system, and they don't want to pay their debts on time”. Hence, I don't see why it should be any different this time with blockchain technology. As mentioned earlier, the industry is very conservative, and the record labels are perhaps among the most conservative especially when it comes to digital change.

Nevertheless, some record labels and music publishers has moved into the NFT space. As mentioned in chapter 5.2, Universal and Sony has bought up the catalogue of Bob Dylan and made the rights into NFTs which will be available at the Snowcrash platform alongside other

artist NFT. In this case it's the record labels and publishers who are going to sell the music rights as NFTs (Stassen, 2022). However, through platforms such as Snowcrash and Opolous record labels and publishers, as well as private investment banks and fund, have more access to increase their amount of music royalty shares. Hence, they can even further increase the catalogue they represent. That said, I think that the record label's move into NFTs represents their need to make music exclusive again. It's a phenomenon that has always been part the music industry – the productization of music. The record labels see this and uses it as an opportunity to sell music as a product to fans, and fans has always been willing to pay for the music that admire.

Onwards, if we take a closer look at music publishers and blockchain technology, we can find some initiatives that are used. For example, Blockur claims that around 70% of music publishers are connected to them through their system. They use blockchain technology and AI to collect, store and analyze data so that the process becomes cheaper and generates more revenue for creators and rightsholders. The publishers can then use the Blockur platform to explore and analyze the usage of their catalogue (Lyons et al., 2019, p. 117). Again, Blockur is an example of blockchain technology as a partly tool of a bigger structure, it's not purely blockchain-based.

When it comes to the artists, the discussion takes another turn. Artists has been at the end of the food chain for decades, even though many scholars claim that the artist have moved center stage in the digital music ecosystem (Tschmuck, 2016, p. 25)

Blockchain technology can provide artists with great opportunities and make it easier and more efficient to be both signed and independent artists. In the case of Imogen Heap's Mycelia application, artists can easily register their work and claim their royalties. The application aims to build a new ecosystem were high ethical and technical standards can provide and promote sustainability, innovation and acknowledged artists rights (Tapscott & Tapscott, 2016, p. 231). Artists on the Mycelia platform can therefore store all their data in one place and share it with their representative managers, labels, publishers, CMOs, etc. using 'the creative passport' feature on the platform (The Creative Passport, 2018).

Another blockchain-based feature that artists can benefit from is NFTs. By using platforms such as Opolous, artists have easy access to a NFT marketplace where they can distribute different sorts of NFTs to their audience. In theory, these NFT platforms can provide artists with new additional income streams where they can earn from NFT sale and resale. Through Opolous artists can receive additional loans for their projects using DeFi loans, which is more

accessible to most artists than traditional bank loans (Opulous, 2022). While it's most common for NFTs to include music rights, NFTs can also include artist art, physical and/or virtual concert and event benefits, merchandize and more. Nevertheless, the future of NFTs is uncertain and it's difficult where it will go beyond the current hype. It's difficult to predict whether or not NFTs will become mainstream in the future. Additionally, as discussed earlier, it's necessary to watch NFTs carefully considering its copyright issues with ownership, digital exhaustion, resale, and collective rights managements (Giannopoulou et al., 2021).

6.2.4 The consumer

When I discussed the relationship between blockchain and the consumer with Garnett, he claimed: *"I don't think it makes any difference. Most consumers just sign up for a subscription to one of the online services. If that's got a blockchain backend into it, I don't think that the consumer cares. I'm not sure that the blockchain means anything to consumers"*. Hence, from a technical point of view, whether or not blockchain is used, it will most likely not affect and/or have any impact on the consumer. However, from a practical perspective the perspective changes when considering blockchain-based streaming services and NFTs. For consumers to even consider switching from a traditional streaming service to a blockchain-based streaming service, the alternative service needs mainstream attention to reach the common public who's not fundamentally interested in the technology behind the service. Additionally, the consumers behavior is the winner. The consumers have a great music streaming deal today. They can access more music then would ever need for only a small subscription fee. Hence, blockchain-based streaming is not only challenged by the conservative music industry, but the consumers as well.

That said, the marketplace for NFTs provides the consumer the opportunity to buy ownership in the music they admire. Similar to buying a stock of a company they like; they can become part-owners in their favorite songs through platforms such as Opulous and Snowcrash. This way the consumer takes a more active role in the actual music and their favorite artist's careers. Another topic concerning consumers and NFTs are the emergence of the metaverse which can further expand and increase the scalability of the NFT marketplace. However, it's somewhat out of scope for this thesis, but I find it relevant to mention for future research.

Chapter 7

Conclusion and Final Thoughts

Through this master thesis research, I have learned a lot about both the current music industry structure and ecosystem, as well as new technologies, especially blockchain technology. In this part of the research, I will present my final thoughts and views on what I have found through my research. I recognize the limitations of the mix method research, and that the findings might be limited and not industry wide. Nevertheless, my research questions have been relevant throughout the thesis, and it hasn't been necessary to revise the research questions. My conclusion about blockchain technology in the music industries will be divided into a top-down perspective and a bottom-up perspective. I will then conclude with my final thoughts.

7.1 Industry wide adaptation; the top-down approach

There has been presented a number of cases where there are blockchain applications in the music industries. The applications can be found across the music industries, from recorded music, to publishing, to streaming, to live music, and copyright. However, even though there are several applications with what I consider to be good business models, other applications I struggle to see sustainability in. Nevertheless, the issue remains the same: there are not any ground for an industry wide blockchain application in the current music ecosystem according to my research. There's no interoperability across the industry for these applications to work together. My research has found that there are three different barriers that implicates blockchain adaptation on an industry wide scale: 1) technical difficulties and data quality, 2) practical issues with current industry structures, and 3) geopolitical and domestic politics and regulations.

Firstly, it's the issue of technical difficulties and data quality. As both Garnett and Umezaki claimed, the music industries have a huge data problem. The quality of the data that's currently floating around data systems in the industry is low and hence, the industry suffers from poor data structures. A large proportion of the data is collected by ISO, and the codes used today (ISRC and ISWC) struggle to do what they're supposed to do. Therefore, blockchain technology does not have a good foundation to build their applications on. Blockchain technology becomes useless if high-quality metadata isn't ensured, which is something that the music industries can't provide as of now. Additionally, there can be

technical issues with blockchain as well. Blockchains are designed in a way where there are limitations of data that can be stored per block. This is a current issue that probably will have significant impacts on the diversified use and scalability of blockchain technology in various industries moving forward. However, it's important to understand that blockchain technology is a fairly young technology that needs to further evolve. As discussed earlier, blockchain technology has a number of great characteristics that can be both scalable and sustainable in the music industries. However, the technology needs to further evolve and mature in order to be more compatible with traditional music industry structures. I think that it is important to imagine how blockchain technology can evolve and what it could look like in the future. Blockchain technology has seen significant improvements only in the past few years, and therefore, it will be interesting to follow the technological developments in the future. Umezaki claims that the technology is still emerging and that it's probably going to be 5-10 years before we can see blockchains true potential.

Secondly, there are practical issues besides technical issues that prevents blockchain technology to be adopted on a wide scale. A recurring issue throughout the thesis has been the fact that the music industry is a very conservative industry with many different blocks of interest. Big music industry players such as record labels, music publishers, big artists, streaming services, as well as non-music companies and platforms such as Meta, Alphabet, Apple, and Amazon, have significant power and control over the current and future structure of the music industries. Hence, the future of blockchain technology lies in the hands of the big players and therefore, we need to wait out and see which direction blockchain is used in a practical manner. Because blockchain technology is an infrastructural technology by nature, it will require organizations to adopt new structures and competence to do things differently. Therefore, blockchain requires drastic infrastructural changes which can be difficult for established organizations and institutions. Therefore, will it become mainstream and a central piece of the industry, or will it become a part of a bigger picture as a practical engineering tool? I believe that time will tell based on the interest and time that the big companies invest in blockchain technology. Because of the industry's conservative nature, it will be difficult to adopt blockchain technology across the industry. It will require a tremendous amount of work to build trust and receive support from all blocks of interest. Transparency and efficiency are some of the key features of blockchain technology, but is that really what the industry wants? Historically, the music industries haven't been positive to technological change. Will that change now? No, because, as both Garnett and Umezaki explained, large music companies

earn their money from not being transparent and efficient. If these companies were to implement a sufficient system that promote transparency and efficiency, it would hurt their bottom line of revenue.

Thirdly, there are issues related to geopolitical and domestic politics and regulations. Recently we have seen some positive trends with digital assets becoming regulated and put into frameworks that promotes its use and adaptation. In the US digital assets has for the first time received a framework that aims to promote the technology and create structures where it's governed and accounted for. This executive order makes it more adoptable for institutions and corporations who previously has been unwilling to adopt it because of the lack of regulations. This is a positive trend for the technology to become more trustworthy for future adoption. Additionally, countries such as Russia and Ukraine have, because of the war, adopted several blockchain-based applications because while standard Fiat currencies can be easily manipulated by foreign governments and geopolitical events, digital assets can have less currency devaluation from geopolitical events. However, on the other side of the trend we have China who has implemented regulations to prevent further use of blockchain-based applications. EU, however, is currently working with negotiations with EU countries to build a framework with suitable regulations for blockchain and digital assets which can both promote the technology and protect users (European Parliament, 2022). Besides, when it comes to copyright law, blockchain-based features are also most suitable in the US copyright framework because there is less chance of copyright implications. This is mostly grounded in the fact that the US don't have the same moral rights as most other countries. Hence, some blockchain applications will struggle to be adopted globally because of differences in copyright law and structure. My research has highlighted the issues of how blockchain can be implemented across the board in the music industries when it's so heavily depended on geopolitical and domestic politics and regulations both on a government level and copyright level. However, it will be interesting to follow future developments on blockchain frameworks and regulations.

7.2 Bottom-up perspective

Besides the three barriers that was presented for industry wide adaptation, there's some drivers that promotes blockchain technology from bottom-up perspective. One of the strongest drivers for blockchain technology is the ideology that we can find with crypto/blockchain enthusiasts. There is currently a large global community of blockchain and crypto enthusiasts where blockchain and crypto is pictured as an ideology. They do believe

that it can change not only the music industries, but rather all industries and the global economy for the better. Hence, taking them into account, the discussion about blockchain becomes much wider. Through the blockchain ideology, blockchain is an idea of freedom across industries, governments, and individuals. The ideology can also be a source for motivation for DIY artists who wants to work outside of the ‘big industry’. For the DIY artists, blockchain can provide great opportunities with niche blockchain-based streaming platforms (such as Musicoin and Audius), music rights registration and management services (such as Mycelia, OMI, Blockur and Verifi Media), and NFT platforms (such as Opolous and Snowcrash). Even though several blockchain-based companies and services struggle to become mainstream and industry wide, they still have a strong community of blockchain enthusiasts and artists who supports the blockchain movement. Therefore, from a bottom-up perspective, blockchain technology can still flourish and further emerge.

7.3 Final thoughts

Because the music industries, and most industries in general, are becoming more data driven, and consumers will acquire music from different digital outlets and will engage with other consumers, the data issue will only further increase. Therefore, it is necessary for the music industries to implement new technologies that can more efficiently identify, store, and analyze metadata in order to better predict future consumer behavior and royalty distribution for rightsholders. This system will need a huge capacity and industry wide interoperability. Will blockchain be the fundamental solution for this system? Based on the findings from this research, it doesn’t seem like that will be the case based on industry controversy and politics. Through this research I have learned that blockchain will most likely not revolutionize the industry. However, if the music industry was to start all over again, perhaps blockchain could be a relevant solution. Nevertheless, historically, the music industries had to adopt to new technologies and practices that has changed the structure for laundering data of existing works. Therefore, blockchain will not fit into these structures as an all-encompassing technology. The potential solution will be a multi-faced technological solution where several technologies play an important part, and each is used to do specific jobs. Will blockchain technology be a part of this system? Yes, the research show that blockchain technology might play an important role and have specific jobs in this structure. Blockchain will not be a stand-alone technology, but rather work in a bigger system with multiple technologies where there is room for innovation for further development. The future of the music industry is uncertain, and it will be difficult to predict what it will look like and how music is consumed,

distributed, and accounted for. Hence, the industry needs a system that is both solid and flexible enough in order to be prepared for future development and innovation of its structures.

7.4 Recommendations for further research

There are some aspects of blockchain technology that I would recommend and take into consideration for further research.

Firstly, in the coming years the discussing regarding renewable energy will see an increasing trend. Therefore, the importance of both knowledge and awareness around renewable energy will be of great significance. As I have briefly accessed in this thesis, blockchain technology can be very energy inefficient and require tremendous amounts of energy. This raises the question: does renewable energy have the capacity to provide blockchain technology with sufficient energy? This is the first area of research that I would recommend taking into consideration for future research.

Secondly, I will recommend a deep dive case study on blockchain adaptation in the music industries. I recommend talking to large music industry corporations who has either tried to adopt blockchain but left it or tried it and stayed with it. This study can help us to better understand the barriers and drivers of blockchain and its scalability within the industry.

Thirdly, I would recommend taking more in-depth research of geopolitical and domestic laws and regulations surrounding blockchain technology and digital assets. As I have addressed in this thesis, institutions and corporations might be reluctant and/or unwilling to use it because of the lack of laws and regulations that can make it more trustworthy. Geopolitical and domestic laws and regulations will play an important part in the future for blockchain adaptation and implementation across industries and regions. Hence, I think this is an important factor to research in the future, and I think we will see more activity in this space going forward.

Fourthly, I would recommend further research on the difference between blockchain technology and other similar and/or competitive technologies. As I have concluded in this thesis, blockchain technology will most likely not be an industry wide solution, but rather a piece of a larger and complex technology system. Therefore, I recommend looking at similar and alternative technologies that can benefit a wide range of industries from an engineering perspective.

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APPENDIX

Attachment 1 – Interview guide

1. Introduction

1.1 A short description of your current place in technology or in the music industry.

Where are you employed and what is your position there?

1.2 Blockchain could mean many different things to different people with different backgrounds. It can be more or less about the strict use of ledgers, or it could be integrated with more traditional digital technologies, meta-data etc. For the purposes of the coming questions, could you please provide a short explanation or delimitation of what you mean by blockchain technology.

1.3 In your opinion, what current issues are the most pressing in the music industry right now?

2. The Blockchain Technology

2.1 What are the pros and cons of blockchain as you see it?

2.2 To your mind: Is blockchain an ideology or is it a practical engineering tool? Or is it both?

2.3 Where could blockchain technology have a place in the digital music industry?

3. Blockchain Technology in the Music Industry?

3.1 Is blockchain technology compatible with the current legal framework in the US and in Europe for music copyright? Will it work both for the master recording rights as well as the master works rights? These copyrights are fluid, ownership and shares subject to change; how, to your mind, will that impact the effect of the blockchain?

3.2 How can blockchain work for the consumer?

3.3 How can blockchain be implemented on streaming services and digital platforms?

3.4 How can blockchain affect the way music is monetized?

3.5 How will blockchain affect or change the way money is collected and distributed to rightsholders through labels, publishers and/or CMOs?

3.6 Does blockchain have to be all-encompassing or can it work side by side with traditional handling of licensing, meta-data handling and reports in the music industry? Is it a stand-alone solution or can it support existing structures?

3.7 Where do you see the music industry in ten years, and does blockchain play a part in that future?

Attachment 2 – Consent form

Are you interested in taking part in the research project

”The Music Industries and Blockchain Technology”?

The University of Agder (UiA) is the institution responsible for the project.

Research investigator: Herman Gautefall Olsson

Research participant name: *Participant name*

Are you interested in taking part in this research project? In this thesis my goal is to get a more in-depth understanding of what blockchain technology might look like in the music industries. For this reason, I’m collecting data from music industry and blockchain experts in order to get insight into the current environment. In the research I will collect and analyze the participants work and thoughts related to blockchain technology and the music industries. Preferably, the participant will answer the research questions with written text via mail. However, if the participant would rather prefer an interview, I will gladly arrange that. Such an interview will take approximately 20-60 minutes. I don’t anticipate that there will be any risks with your participation in this project, however, you have the right to withdraw from the research at any time.

As mentioned above, I would prefer written text from the participants because then you could choose how you will formulate your answers, and hence, more easily take confidentiality measures needed for you or your firm. This consent form is necessary for us to ensure that you understand the purpose of your involvement and that you agree to the conditions of your participation. You have the right to send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data. Would you therefore read the accompanying information sheet and then sign this form to certify that you approve the conditions?

By signing this form, I agree that;

1. I am voluntarily taking part in this project. I understand that I don’t have to take part, and I can stop the interview at any time.
2. The written text or the transcribed interview or extracts from it may be used and quoted.
3. I don’t expect to receive any benefit or payment for my participation.
4. In the case of an interview, I agree that the interview may be recorded, transcribed and analyzed and I can request a copy of the transcript of my interview and may make edits I feel necessary to ensure the effectiveness of any agreement made about confidentiality.
5. I have been able to ask any questions I might have, and I understand that I am free to contact the researcher with any questions I may have in the future.

I give consent for my personal data to be processed until the end date of the project, approx. 20.05.2022.

Attachment 3 – Nic Garnett interview transcription

A short description of your current place in technology or in the music industry. Where are you employed and what is your position there?

Nic Garnett: *“I’m currently a consultant in Norcode. And as a consultant in Norcode, I am the project manager for the development and deployment of this rights management technology that we are developing for the African market. I am currently working with a systems developer in Nairobi, on behalf of Norcode, who is developing a number of online applications for us, for which we then... rather Norcode then intends to make available free of charge to collective management organizations in emerging markets in Africa. And I can send you more details about that if you’re really interested.*

Previously in the music industry, until 1999, I was working at an organization called IFPI (The International Federation of Phonographic Industry) which is the global trade body, trade association of the recording industry. And my job there was to run anti-piracy campaigns around the world, was to lobby for changes to copyright law in the interest of record producers and increasingly to manage their response to emerging technologies. I then moved on in 1999 and went to work for a Digital Rights Management company in Santa Clara in California, which was called Intertrust which was going to revolutionize the music industry with its DRM technology. We can come back to that actually because the similarities between that and blockchain technology are very obvious. Ok, so, that’s me”.

Blockchain could mean many different things to different people with different backgrounds. It can be more or less about the strict use of ledgers, or it could be integrated with more traditional digital technologies, meta-data etc. For the purposes of the coming questions, could you please provide a short explanation or delimitation of what you mean by blockchain technology.

Nic Garnett: *“Blockchain technology for me is basically what people talk about, generally is the distributed ledger system. But I think it’s a great deal of confusion about what blockchain actually is. I’m not a blockchain expert by any means, but my understanding was that the whole concept of blockchain came out of. what’s his name? Satoshi. He created a cryptocurrency to prevent double (mumbling) sharing of*

value within that system. So, it came into being, the particular form of blockchain came into being to support, you know, cryptocurrency. Now it's sort of been taken up, and it's one of those buzzwords that people use. I personally then think it has any particular attributes that render it suitable for the music industry or not. I mean, it's just a way of doing things. So, you know, it's obviously being used in many other industries, and it suffers from all the problems with new technologies. I mean, most of the blockchain systems that I've looked at are based on Ethereum, but my understanding is, that's one of many platforms out there. And as usual, each developer wants to run the world, like Windows, and they're just keeping bumping into each other. So, there is no real interoperability between these different systems. So, for me blockchain is a way of doing things. It's like saying "what do you think of word processing?". You know, works great, it's a productivity tool, and it works, but what do I think word processing for the music industry? Well, they can use it if they want, you know. I don't think it has any particular applications in the music industry, it can be adopted there, but I think there are problems in the music industry that prevented it being used properly there which we can talk about in a minute".

In your opinion, what current issues are the most pressing in the music industry right now?

Nic Garnett: "From my perspective, what are the current issues that are the most pressing in the music industry right now. I think, this got nothing to do with blockchain, but the way the music industry evolve. I started in the music industry 40 years ago when people were just about to start selling CDs. You know, the record industry was an industry based on buying talent, performers, and composers at the lowest possible cost, and selling their output at the highest possible price. That's a very simple business model. You know, some record companies were very good at it, some companies weren't very good at predicting what would sell. There was a lot of consolidation in the record industry so that you now ended up with effectively three major record labels and lots of independent labels around the world.

Now it's moved mostly to streaming, and there's a lot of excitement in the industry or see IFPI just published their annual digital music report which is talking about huge growth rates in revenues from streaming. But streaming, you know, is a really wired model for the music industry, because it's a very flat model, and there are limits for the revenue it can generate in the sense that it's a rental model, there's only so many

renters out there, whereas where the sales model, you can just keep selling until.. you always have the opportunity of massive sales on a particular title, which isn't really there in streaming cause everybody pays the same price for everything.

So, I think the long-term prospects for the music industry are not good. It's full of people telling you that it is good because they're all trying to get out. But, you know, it's a different basis. When I left IFPI in 1999, the global revenue of the recording industry was about 40 billion dollars – ok - now it's about 25 billion dollars. So, it's still 40% lower than it was then 20 years ago. And I don't see it growing so much more. I think also that the model for music – this is going to take me into the second thing which I think is a big issue – is that, like it or not, music is out there, there are place you can go online, you really don't have to pay for music anymore. And, you know, IFPI and IRAA in the US, and I'm sure other groups around the world, are all always telling you that they're making great in rose to deal with piracy. And anyway, piracy is not particularly relevant in a world of streaming. But, you know, I don't think that the music per say has got much value left in it. You know, either because it's being streamed and it's just endless amounts of music that can be out for 10 ponds a month. Whatever it is, I don't subscribe to anything, I've got my own collection of what I want to listen to. But, you know, I'm not sure how much value there is left in music per say, recorded music per say. And the key thing therefore, for me is no longer the music, but the information about the music which is critical. In other words, how do I find what I want out there? How do you account for what has been consumed out there? I think I was reading yesterday that some collecting societies – where was it? – is now processing – oh ICE, which is the joint venture between the PRS and (mumble), and the three big CMOs in the UK, Sweden, and Germany. They're processing 27 trillion transactions a year. Which seems to me a Ludacris proposition, but that's how copyright works. And if they can do it, well, then they haft to do it. You know, to do that, you need massive data management capability. And one of the things – so this is the second issues I think is most pressing in the music industry right now – it's never got its data act together. You know, it will tell you that it's doing great stuff with coding systems like ISRC and ISWC, so on and so forth. ISRC was developed at IFPI while I was still working there, so I need to take some of the blame here, but it's a Ludacris system, I doesn't do what it claims to do which is to uniquely identify every original sound recording. Because it hasn't got mechanisms for managing the data, so

it's full of – most ISRC databases are full of duplications, and rubbish, and goodness knows what. And it doesn't seem to be much of an effort to clean it up. Although having said that, there are good people at IFPI now which you may want to speak to. I know they've been working hard to sort out these problems. But to give you an example of what I'm talking about. ISRC has a problem, for example, with multiple issues of ISRC codes for the same recordings. Because the way it works is, it's a localized system – it's not centrally coordinated, or it hasn't been in the past, maybe that's why they're working on it now. The basic problem is that if I release a record in England, then my partner in France releases the same record, we both apply of a ISRC code locally. So, you end up with the same recording has different codes in different countries. And then off course you haft to think about when a recording falls into the public domain, anybody can apply anywhere for a ISRC code for it. So, you know, if you check out tracks – I use a lot of jazz recordings to do this – check out on the sound exchange or the PPL lookup systems, you'll find that the same single track going to have 35 different ISRC in the sound exchange system, and a different 35 in the PPL system. So, you know, they have never, ironically, this is where Bendik and I first met in person, because we were both involved in an initiative at WIPO in Geneva – the world intellectual property organization – to try to create a framework in which we could encourage the music industry to come together, its different sectors: the record companies, the music publishers, the composers, and the performers. So, to work together to create an interoperable framework for all the data that they needed. And the major record labels shoot it down and said “No, they don't want to do that”. Which, I don't know why, but it leaves you to think perhaps they don't want precision, they don't want things to be managed properly. Because maybe it doesn't fit with their business model. I don't why it is, but so many other industries – I'll give you an example – when I did a report for that initiative with WIPO, and you know, you're familiar with bar coding? Bar coding on products is a very highly integrated and sophisticated systems so that you can track the product from the machine in the factory in China to the supermarket shelf in in England. Yeah, and the whole thing is trackable with different bar codes and different coding systems from one end to the other - and look at the acronym of the company that of the organisation based in Brussels that manages that whole system - but it works extremely well. We've talked to them about if we can you do the same thing for the music industry, and they just laughed. “Sure” they said, “it's not worth it”. And I also talked to a company called

Verisign, which you probably know maintains some of the key domain name service for which run the Internet. I did a study for them in the music industry, and they looked at it and they said, “we don't want to go anywhere near that”. You know so the music industry whatever it says has got a huge data problem, and I don't know why, you know, I've been looking at it for 30 years now and I don't know why they've got such a problem. But you know, nothing is interoperable. Nothing is open. Nothing is transparent. That's my ranting. Those two are the key issues that, you know, you're moving to this streaming model so that the music is all out there. And therefore, you need very good data systems, and they don't do good data. Yeah, there's a problem. That's just my view and I don't know what's going on in the industry on a day-to-day basis”.

What are the pros and cons of blockchain as you see it?

Nic Garnett: *“Well, the pros are theoretical. I think the cons are real. Let's just get back to that comment I made earlier when I was working 20 years ago at digital rights management. The idea behind digital rights management was that a supplier of online music would encrypt that music and would then send it to a consumer in an encrypted format. At the same time, for payment, would also deliver the key to unlock that content. And the idea was that the supplier, most likely a record company, would have complete control over the delivery and use of the music online. As it turned out, the company that invented that, the one that I worked for, was nowhere near big enough to implement it. But the theory was perfect. The theory was that, you know, everything will be encrypted, and it cannot be used unless it's, you know, you have the token to unlock it. All of that can be logged, and there'll be perfect counting.*

I can remember going to a management meeting, and one of the people in the meeting at Intertrust said “this is great for the record labels. They'll be able to figure out how much they owe their performers and composers in real time”. I said “you must be mad. They want to sit on that money that they owe them for as long as possible”. They make money from that latency in the system, and they don't want to pay their debts on time.

The theory is that with blockchain everything can be training everything can be perfectly accounted for, there can't be any trickery in the system, because you know, you got these distributed ledgers everywhere, and everything is set in stone. And then you get the other bit which is that all of this can be supported by smart contracts,

which means that everything is connected. The deal which consumer makes to get a piece of music will also fit into the blockchain structure, and everything will be transparent, everything will be straight forward, everything will be minutely recorded, and you know, accounted for. That's what you will hear for the pitch for someone building a blockchain music system. But is that what the industry wants? I'm not sure that it does.

The history of the music industry is full of corruption. And I'm not making any accusations now, but it's still going on. There are countless stories of performers and composers being ripped off by record labels. But then even with the best will in the world - and I think the record industry is a very different place than it was even 20 years ago, I think it's much more business-like and straight forward and you know lot of those old problems have disappeared -but I don't think the industry have the data systems in place to support a proper cross industry blockchain application.

Cons for blockchain, I don't know, I think the biggest one is that they are proprietary systems, and they don't talk to each other, so, you've got the age-old problem of interoperability. The other thing which I'm not so clear about, although you know, I'm not a blockchain expert, is that blockchain is supposed to be irreversible, once it's on the blockchain is on the blockchain. That's not either how commerce works, we're always revising deals, were always going backwards, and doing things again. I just wonder how modern blockchain systems view with reverse ability, and you know, modifications and so on and so forth. I don't know, that's something to ask your blockchain experts.

What I have seen is that like DRM, you know 20 years ago I was working with Intertrust which had most of the patterns in the DRM space, but there were lots of other companies and DRM was the big subject in the music industry 22 years ago. Really went nowhere. Oddly enough, in Kristiansand, you know, at Daniels roundtable conference back in 2017 or 2018, I was attending and there was a guy there who was representing the IBM blockchain solution for the music industry. He gave a presentation and I walked up to him after and I said, "that was a remarkable speech". And he was smiling. I said "I heard exactly the same speech 20 years ago from the head of Intertrust DRM, exactly the same speech. But you're going to solve all the problems in the music industry, everything is going to be absolutely 100% accurate

and correct”. And then he wasn't smiling, but you know, it was uncanny, really bizarre how close it was”.

To your mind: Is blockchain an ideology or is it a practical engineering tool? Or is it both?

Nic Garnett: *“I think it's a practical engineering tool. I'm sure there are plenty of industries using distributed ledgers very effectively. I worked with a bunch of guys in Singapore, about three years ago now, who were putting up a blockchain system for the music industry in Asia. I remember spending a day with them in Singapore to talk about the copyright part of it, and we didn't really talk about the copyright part of it because all these blockchain systems depend on a cryptocurrency. And the game was, as with a lot of these blockchain start-up, to develop their own cryptocurrency to support their particular blockchain. And the idea was that you raised money with what they call ‘initial coupon offering’ or an ‘ICO’. All the talk back then in Singapore was not about how the blockchain system would work or how they would run the ICO. ICO is like an IPO, you go to the public and you say, “do you want to buy some ICOs to use on our platform, because their value is going to go through the roof when our platform becomes the number one blockchain platform for managing the music industry in this part of the world”. Then a number of countries started banning these ICO initiatives because they were scams. The guys I work with in Singapore, I think it was a genuine effort because there are a lot of music people involved, but it never went anywhere as they couldn't solve the fundamental problems in the music industry. So many of these blockchain initiatives I've seen in the music industry start with the idea that the music industry has so many problems with its data, we can solve that with blockchain. Unfortunately, you can't, because blockchain is only as good as the data you put into it. The blockchain itself doesn't solve the data problem. I think it's also hampered by all the confusion about smart contracts. Because I'm a lawyer by training, and smart contracts in my book is not a contract, it's bad use of words. Certainly, under English law, in order to have a contract you got to have two human beings who agree to do something, not to machines. That's problematical too. So, I think that blockchain is a practical engineering tool - is it being used like that in the music industry? Yeah, I think in some places it is, but I don't think it's having much impact.*

There's a piece I pulled out from music industry news sheet called Musically, you should checkout musically, in which they analysed 15 or 16 different blockchain start-ups. I doubt whether any of them are still around”.

Where could blockchain technology have a place in the digital music industry?

Nic Garnett: *“In theory everywhere. Because it's all about transactions and what not. But the other problem in the music industry is that it's a very conservative industry, believe it or not. It hates to change and do things new. Which is why the record labels struggled for 20 years before they started making money in the digital space. They're very reluctant to change. One of the things that we are facing in Africa is - as I said to you the beginning; technology is the easy part, what's difficult is to change people's mindset for the idea that they give up the old-fashioned way of doing things and adopt new technology which does things in a different way. So where could blockchain technology have a place in the digital music industry? Probably managing the data from streaming. But you could set up systems where all of the streaming transactions would be managed through blockchain systems, but to do that you would need a tremendous amount of work across the industry. And as you probably know, the industry is very fragmented. There are different blocks of interest; there's the record labels, there's the composers there's the music publishers, there's the collective management organisations. They're all fighting for their lives. Often that fight involves a lot of resistance to change. In theory, again, blockchain could be useful but I don't see it happening across the board”.*

Is blockchain technology compatible with the current legal framework in the US and in Europe for music copyright? Will it work both for the master recording rights as well as the master works rights? These copyrights are fluid, ownership, and shares subject to change; how, to your mind, will that impact the effect of the blockchain?

Nic Garnett: *“My understanding is for blockchain to be useful it records transfers of value. So, you got to have systems which enable transfers of value. As you probably know, we have in the world essentially two systems of copyright; one is what we call the ‘common law system’, which is in England, and in the United States, in Australia, New Zealand, India. And that is based on the idea that people who create things have the right to control copying of that thing. It's very much a utilitarian pragmatic idea that you need a basis for commerce in these things, and that's where the Anglo-Saxon feud is thought to have developed from. Opposed to that is what we call a ‘civil law*

system' which is in the rest of the world and certainly in most of Europe. The idea is that only human beings can have rights in what they create because they are the product of their mind and therefore, they should have absolute control over them.

But to get to the point. I don't think that there is any fundamental obstacle in either the civil law system of what we call 'authors rights, and, the common law system of copyright, to prevent the use of blockchain technology. There's no obstacle in the copyright law to any of this. If I am the owner of rights in a particular piece of music, as you know, in one piece of given, either in a sound recording or an assault, there are different rights involved as part of the copyright law. Most of those can be made subject to a transaction. There are some complexities because I'm talking about the economic rights in works in music. There are also, certainly in civil law systems, what we call 'moral rights', which means, these are the rights that a creator must ensure that his work isn't corrupted in some way or that it isn't distributed initially without their permission, and that they are recognised as the creator of that work.

Those are well established in European civil law, and you can't negotiate them, you can't sell them, you can't transact in relation to your moral rights. I've started introducing them in the common law systems in the last 50 years, they don't work very well, and we always try and exclude them in contracts that we write for the exploitation of works under common law systems. So, the moral rights in copyright are not something that can be dealt with in a blockchain systems. But that's not a major problem, you're still going to be dealing with the economic right, so, I don't think there's any problematic objection to using blockchain because of the structure of the copyright law”.

How can blockchain work for the consumer?

Nic Garnett: *“It depends on what the consumer wants to do. I don't think it makes any difference. Most consumers just sign up for a subscription to one of the online services. If that's got a blockchain backend into it, I don't think that consumer cares. I'm not sure that the blockchain means anything to consumers.*

One of those things that you find in this technology space, is that - and I saw this when I worked in Silicon Valley - is that you find the hundreds of people sitting around in coffee shops with their MacBook's thinking about the next business venture. Coming up with an idea that this is going to be perfectly free to the consumer, 100% of the

revenue is going to go to the rights holders, and we found a way of doing it. And the next stage is that you must go on somebody who's going to bet on you being able to achieve that. There are hundreds of these companies that come and go and then if they know somebody in the newspapers, they'll get a piece of a piece written about it and so on and so forth. Like I say, I'm not aware and I mean I've seen so many stories about blockchain companies coming and going, you never read about them going, but then you look for them and they've gone. The guys in Singapore were saying exactly the same thing: the rights holders are going to get 100% of the revenue, we just take a subscription from them every year. None of it is sustainable. I mean the people to talk to is not the little start-ups. The people to talk to are the people at Universal Music. "What are you doing with blockchain". Talk to the guys at TONO, talk to the people at the PRS, talk to ICE. Until there talking about it, not just talking about it, but doing it, I don't think it's really going to have much impact in the music industry. There will always be masses of start-ups.

I'll be honest with you, I was interested that you were looking again at blockchain. And it's probably a good time to do it because you might be able to write your thesis on the basis of 'this is what we all thought it would do', but you can now figure out 'well OK it didn't, why not'.

The other thing that I don't know whether you touched on this on your other questions, but the other thing that there's a lot of talk about at the moment are which obviously blockchain-based are NFTs. And there are two very strong views on this. Again, there are masses and masses of little start-ups that have come up with their version of NFTs. Yet the big labels are saying "woohoo be careful, is this making sense?" Indeed, yesterday I saw something where one of the big labels were saying "we are watching NFTs very carefully because we are very concerned that they're going to start infringing our rights". There I see that there is a big problem between exploiting NFTs and copyright. I'll be thinking maybe that I should think some more about the relationship between copyright and blockchain, because one of the problems that we had when we were doing DRM 22 years ago, was the people kept talking to us about "how do you make your digital rights management system compatible with copyright".

I should have said this to you earlier, there are issues with copyright law and blockchain, because insofar as blockchain makes possible something which is not

permitted under copyright law, then you have a problem. We had this problem 22 years ago; it was then called 'the problem of digital lock up' where our idea was that Universal Music would use our technology to encrypt the sound recording to send it to a consumer who could not use it unless they paid to use it. A very simple challenge to that idea is that in many copyright laws, particularly in Europe, there are some circumstances in which consumer can use a copyright work without the permission of the copyright holder, these are called exceptions and limitations and they are codified under European copyright law. So, the question arose, and I did a big study in this, where the law says you can use something for free but it's been locked up by digital technology, how do you resolve the problem? And as usual, the European Commission couldn't answer that and fudge it. They basically said, "so we'll leave it to national member states to figure out how to sort that one out". It's a very interesting question.

Insofar as a smart contract on a blockchain enables me to make a use of copyright work that is not permitted - you've got to work you've got to think in terms of parallel authorization systems and are they align? If copyright laws say I can do this, I can't do that, one of the blockchain systems says I can do that, but you can't do this. So NFTs presented problem, because you're creating a value based on a copyright word, but it's not controlled by copyright. NFTs are the new blockchain. 3-4 years ago, all these little companies started coming up to do blockchain, now there's all these little companies coming up every day of another NFT company. Some of them survive, some of them don't. I'm a very serious listener to music, do I want to pay \$65 million for the original digital implementation of a Miles Davis recording? I don't think so, I'm interested in the music. But some people do, they pay 63 million for that NFT of that picture that digital image that some guy did. I mean, sometimes the digital marketplace really goes mad".

Additional question: can NFTs become mainstream in the music industries, for artists and fans?

Nic Garnett: *"It's unlikely, isn't it? But then he knows? I mean, what always amaze me in the music industry is that ultimately so little of it is about the music, it's about products. I suppose that because that the music itself is available everywhere through streaming the people are trying to lock it down into products again. Which is why vinyl sales are going through the roof, and why people are crazy about NFTs, because they think they've got something - or in the case of an LP they've got something*

tangible - in the case of an NFT they've got some kind of property right in something related to a piece of music that they like or admire, or they think other people do. I mean is this sort of productization of music, which has always been part of the industry, I don't think it's mainstream to be honest. I think we will see a lot of activity around NFTs just as we saw three years ago with blockchain platforms. As we saw 20 years ago with DRM, they'll find their place, but it won't be, it won't be major. It really won't be major. I would imagine even the big labels will do some NFT work before their performers will.

I don't think, we'll have to wait to see whether NFTs is becoming a mainstream product within the industry. I tend to the view that these are supplementary values, that there are problems with copyright. I mean, if you own the rights and then you issue the NFT, everything is consolidated in one place, it's easier. What I saw yesterday was one of the major labels was complaining about the fact that third parties are creating NFTs, they don't actually own the rights to the underlying music. Watch this space, I mean it could be big - but I'm in a I'm not betting on it”.

How will blockchain affect or change the way money is collected and distributed to rightsholders through labels, publishers and/or CMOs?

Nic Garnett: *“The idea of blockchain is that it’s precise and it's transparent and its sort of independently run. Therefore, you should get complete accuracy and complete transparency. And insofar as that doesn't exist at the moment, and I'm not making any accusations, but insofar as labels, publishers and CMOs do not operate on the basis of complete transparency and accuracy, then blockchain will change that if they choose to apply it, and they have the data systems which enable it to function. There's also this debate going on at the moment, I'm sure this is part of your research as well, about how you account for music that is used online. Whether you pay for the music you're using, counting the rights holders for the actual music used or expose, or rather than just giving them a share of the total revenue. So, there's a big debate going on there which again blockchain could make this very straight forward.*

We just keep coming back to the same point. Unless you got an industry wide, and that means all the players in the industry, operate together on a common data standards and platform, you're really not going to be able to make the best use of blockchain technology. As far as I know there's nothing currently going on to try and sort out these data issues which is why it's so exciting to work with Bendik and Norcode on this

project in Africa. Because there you have none of these legacy problems that we have in the West, and you can really start getting back to basics and doing this in a more advanced way and more sophisticated way. One of the problems we're looking at in Africa is the fact that even the data systems that do exist in the music industry are all based on what I call assertions. In other words, if I'm a record producer here in the UK, I am an independent record producer. I produced your new recording; it has 10 tracks. So, I go along to my local ISRC agency, which is called PPL in the UK, and I said "I've got 10 new tracks for Herman's first LP and I want 10 ISRC please". Maybe there's a price, I don't know. Then I come away from PPL with 10 ISRC codes and I apply them to each of the tracks. PPL might keep a record that they've issued those, and they might say to me if you want to licence Herman's recording through PPL then you must tell us what the ISRC code is. But it's all based on me saying to them; that song that he called "my blockchain project" has got this ISRC code attached to it. In other words, I tell them I assert the connection between the ISRC code and the name of a recording. What we are trying to do in Africa is change that from what I call assertion-based to object-base. In other words, we are creating systems whereby when you register a work with a CMO in Africa that we are helping, you will actually deposit the digital file containing the work. So, you give an MP3 file which has got your recording in it. We give the file its own identify regardless of what's in it. Then we say that ISRC code relates to that digital file. In other words, we're not saying anything about it, we just saying that file has that ISRC code, so you've actually got the actual recording of the music connected to the ISRC code. I'm still supplying it to the file, and that could be challenged. But it's better to actually have the music there than just simply saying I'm attaching this code to this piece of music. All I'm saying here is that there are much better ways of doing data than what exist in the music industry at the moment, and blockchain is only as good as the data you put into it. The technology is only as good as what you put into it. And if your industry has not got the data system, because you know without the data systems blockchain is meaningless".

Does blockchain have to be all-encompassing or can it work side by side with traditional handling of licensing, meta-data handling and reports in the music industry? Is it a stand-alone solution or can it support existing structures?

Nic Garnett: *"I think it can work side by side, because it does at the moment and there are blockchain systems out there. If I'm a record producer I could decide if I'm*

going to use this blockchain system in France and I'm going to use the traditional method in Norway. I don't think they're mutually exclusive, no. What I do think you need is common data standards so that you know what's what. But to me the analogy is word processing. Can I write a book with word processing? Yeah. Can I write a book without word processing? Yeah. I'm going to be using the same language if I write in English, it will be quicker and more accurate if I use word processing because it will correct my spelling and it will be doing certain thing. But at the end of the day, it's got to have good input from me. So, I think it can exist alongside existing structures and I think it can be applied to improve existing structures, or more likely, it can be used to set up more efficient structures”.

Where do you see the music industry in ten years, and does blockchain play a part in that future?

Nic Garnett: *“I don't think. I think it will go on in the next 10 years. I think we have more or less plateaued now. I think we will just see streaming becoming the 85-90% of the business of music distribution in most parts of the world. If the industry can get its data stuff together, it will become more efficient. What are the prospects of it doing that? I don't think they're great in the short term. Yes, there will be stand-alone blockchain systems. Will there become a single unified blockchain system? I don't think so. Will there be a framework for creating interoperability between different blockchain music platforms? I doubt it. Are the big online music services going to start using it? Is Spotify going to use it? Is Apple Music going to use it? Is YouTube going to use it? Is Amazon Music going to use it? They are the key players in the future of music. Yes, there will be some fun and games with NFTs, and then somebody will come up with something else which might use parts of blockchain technology.*

There's a couple of comments that I would make their. First of all, I think you're right. I think that there will be big changes in rights management in the coming years, it's underway already. The traditional way, the TONOs of this world, having this central role in licencing. There's a lot of challenges to that model at the moment. The other comment I would make is that I go back to DRM 20 years ago when everybody thought DRM was going to revolutionise the music industry across the board. It didn't. But it's still there, DRM. We use DRM every day. I mean there's DRM in Adobe documents, Amazon uses DRM. Digital Rights Management is there, but it's a small part, a key part - but it's a hidden part of a much bigger model. I think probably what

we're going to see is that blockchain technologies will do different jobs, but will it revolutionise the whole structure of the music industry? I don't think so. It might be that Universal Music sets up a system for accounting to its artists for streaming use of the recordings using a blockchain system. It might do small jobs, small but important jobs in different parts of the industry. But is it going to revolutionise the whole industry? No, I don't think so. It'll be like DRM. I mean DRM is a key part of Adobe Systems, it's a key part of Amazon Kindle, it's used all over the place. Some of it uses Intertrust technology because they've got strong patents in that area. When I worked at Intertrust, Wall Street loved Intertrust because they thought it was going to revolutionise not just the music industry but the whole world commerce. The whole world commerce would be dependent on Digital Rights Management systems for organising relationships between suppliers and distributors around the world and manufacturers. But it never happened. It's just used for specific jobs within this industry. That's where I think it it'll go. I think it's good to know about blockchain because it's the technology system that will be used in different parts of the industry. But I don't think it's going to define the music industry. The music industry is always going to be about the relationships between the different parties in terms of creating products with the public. And whatever works best, and which drives the most profits for the biggest players. And then of course, you got to think about how the big technology platforms the Amazons, and the Apples, and the Googles all use music these days”.

Attachment 4 – Ken Umezaki interview transcription

A short description of your current place in technology or in the music industry. Where are you employed and what is your position there?

Ken Umezaki: *“I’ve been in the music industry for about 12 years. I have a previous career in finance for 25 years as a manager of trading businesses. I have Co-founded three companies, I do investment in music startups and artists as well, and Verifi is the third company I have co-founded. The company is called Verifi Media, we’re in the music, or really the media rights data services space and we’re trying to leverage modern technology and tools. To answer the question - I use this a lot to synthesize what we do - to answer the question ‘who owns the rights to this song? It’s actually a very complicated thing to try to answer completely. It’s also a complicated thing to keep it current in terms of the information. Our role in the music ecosystem is to provide a service that allows that information to be systematically shared, maintained and updated, and also collaborated upon by the various stakeholders. I’m the CEO of the company”.*

Blockchain could mean many different things to different people with different backgrounds. It can be more or less about the strict use of ledgers, or it could be integrated with more traditional digital technologies, meta-data etc. For the purposes of the coming questions, could you please provide a short explanation or delimitation of what you mean by blockchain technology.

Ken Umezaki: *“I’ve been involved personally from the early days of crypto related blockchain stuff from about 2009 or so, so relatively early if you think about when Bitcoin emerged. I’ve also always had an interest in looking at emerging technologies. Our company, Verifi, was originally called ‘dot blockchain media’ and that’s because we wanted to leverage blockchain technology to answer this question: ‘who owns the rights to this song?’ So, my view is formed by having watched the rollercoaster ride as I call it sometimes of what’s gone down and up and sideways, not just in crypto but all the different things including almost “evangelical” promises of what blockchains do for the world. In my opinion, “blockchain” still an emerging technology, it’s a tool. It is not a ‘one shot fix everything’ tool at all. In fact, most emerging technologies that I’ve had a chance to work with are ‘work in progress’ for a good decade or longer.*

The technology is starting to emerge now, I think. We're broadly coming out of what I think has been a very sort of understandable period of evolving what the chain is and how the technology is deployed and the use cases and so on.

In our case, the chain is not what we use as 'THE solution' to get to our primary value proposition, it's a component of what we do. So, we often talk about the fact that we are a rights management solution that is anchored on the blockchain, but we're not a blockchain solution for rights management, if you get the drift. I think most of the companies that are looking at broad use cases, that are away from crypto, what you're starting to see is that there's a place for blockchain technology, maybe. But it's not a comprehensive solution to almost every use case you can imagine. We've always had that philosophy despite our early name. I do think that it's important that - at least from our opinion, and I think the view of many others - it's still an emerging technology, it's a useful tool for some things, but not everything. You do need to actually kind of really understand it well to know the pros and cons and try to evaluate what the most effective deployment is or whether you should deploy it at all".

In your opinion, what current issues are the most pressing in the music industry right now?

Ken Umezaki: *"I think my thesis around the music industry, first of all, in context, is that it's an extremely small industry in terms of revenue scale. Might be culturally relevant, but at the end of the day it's the smallest of the media businesses. Some people will say it's about 60 billion in revenues per year globally; that's kind of a number that gets thrown around. Up from 50 billion 10 years ago, finally it's growing again. A lot of people think it's going to be 75 or whatever, but even if it gets to 75 or 100, there are individual companies that make more money than that a year. So, the first thing to understand: it's actually a relatively small industry. The second thing is we are clearly in a digital transformation, and it's been going on since Napster. It's almost 20 years old now, and the business is going to continue to experience transformation. It is accelerating, and it's going through the 30-year adoption cycle that some people like to talk about in the academic world. So, we're 20 years into a 30-year adoption cycle. So, what does it mean? So, the digital landscape now dominates the monetization of at least recorded music - take live music out for a second - that's in the digital sphere, so you now have a definitive business regime that is 80% to 90% driven by digital output. Digital consumption, digital creation, and so*

on. I think that's another thing that's happened: it's done; we are in the digital world of music.

So, then let's talk about the creators, I think that's important. It's become extremely easy to create music, like crazy easy. We are now experiencing a world, even in Spotify, which is north of 60,000 new songs a day. Maybe as importantly, you can collaborate with anybody, anywhere. Music is no longer created and recorded for four months and then finally a perfect song gets released (something like a Steely Dan song comes to mind). It's a dynamic animal almost; remixes, people are sampling their stems, you can move stuff around; it's a pretty incredible time to be a music creator in terms of the creativity and the ability to collaborate. I don't think that's over yet. I think recorded music product is going to become much more of a non-static thing but more like an evolving organism; it can change and morph overtime and that's going to be a lot of fun. So, that's happening, and I think we're really just beginning to see that era of collaboration, consumption, distributed consumer economy in digital land. There're over 300 streaming services around the world that stream music content. There are some big ones that obviously dominate, but there's some regional ones and then there's some niche ones. Now we have also a much more rapid consumption rate of music in UGC land than in controlled music land, so you know like TikTok, Instagram, gaming, all that kind of stuff. I actually think this kind of 'consumer choice world' that we live in or this 'digital consumer economy' also is just beginning to take hold. We're going to see more TikTok like things, you got the metaverse, you got new places where people will be aggregating to listen to music content.

Back to your question, what are some of the issues that go on. I think those are the things you want to contextualize. Issues and opportunities, I guess. But one is, what is the future of the current recorded music industry companies? They really do need to - and some of them have, but some of them haven't - morph quite dramatically to maintain and be part of this kind of changing ecosystem. So, there's a lot of buzzwords right now about things like 'creator economy' and driving a creator-based economy. I think there's a services component that needs to be visited. I think that's the highest challenge that the music industry has is B2B companies need to maintain change in order to be relevant.

Second big issue to me is the music industry has not evolved quickly enough to be really a data-driven business model. There's still this kind of migration that needs to

happen within the industry. So, beyond what I just said, there's actually underneath it all a need to be more data literate to run your business well. That's a theme that we at Verifi think about a lot. The biggest opportunity we think we have, away from our specific products, is actually making the music industry and the people who are working in it more literate on how to work with data and how to manage their business from a data lens. I think that's a big challenge, not the least of which is the music industry is literally only seven years into the digital music business which has become a large enough revenue component of the industry for it to matter. That's actually not that long. I think what we've got going is a very rapidly evolving, almost mindset around, 'Oh my gosh I really need to know how to manage my data well'. And that's an industry wide challenge and a necessary foundation in order for the industry to do things well.

The last component I could think of is obviously very near and dear to Verifi's heart. Data complexity is increasing. The need for more transparent or better data is growing at a rapid rate. By the way, that data needs to go places, because somebody is putting up yet another TikTok dance move video for some song that no one has ever heard of right now. And we got to be able to identify that so the right people can get paid, and God forbid there's 15 people that are supposed to get paid less than a penny per stream. The only way you can actually figure out how to do that well, in my opinion, is you got to have a much more rigorous data service or hub that the industry can actually draw upon to understand 'who owns it' and 'whether or not the thing's licensed'. Those are the two things you got to figure out and if you can't figure those out, I don't care how good your tech is, I don't care if there's blockchain or not: whatever you're doing is not going to actually scale. So, we fit into the 'Who owns the rights' part of that equation. We're not in the licensing business, yet, because we think even on the licensing front you got to answer the question 'who owns the rights' first. We know that you can do a lot of things with that data and a lot of things with those music assets that have good data. You can't do it without answering that question. So, we've always believed that firstly, we got to make that question answerable systematically and when and if it happens, we have got ourselves the ability to make that data literacy happen”.

I then asked Umezaki an additional question where I asked him to elaborate further on how Verifi Media cope with the type of low-quality data that's currently floating around

in the music ecosystem. Umezaki further explained the current state of the data quality in the music industry and how we can better the data quality by sharing data through data collaboration.

Ken Umezaki: *“Because of my background (I did very algorithm and data intensive products for the most part of my life in finance) I have a relative perspective I share often. If you took data literacy using that term again broadly in finance, it almost definitely has to be or is on a scale of 10 and 9/10 or so. It's not perfect but it's pretty good, because you're literally trading billions of dollars in a nanosecond using a computer. The data better be good and the people using it better really understand the pros and cons of thinking about things like big data or algorithms or models. So, hence a 9/10. The music industry having that vantage point, and this is not a critique, it's just a status of where we are, I think it's like a 2/10. I said this publicly before and I get yelled at because some are like ‘we're not that bad!’. It's a relative comparison based on one person's opinion, but it does get at what you're saying which is there's a lot of things that you can't do because the data is not good. The idea is to enable things to happen more efficiently, faster, make more money, operationally more efficient, service your clients better. Those are all not crazy things to try to accomplish with music data - in our case, music rights and metadata – because I've seen the other side. It's doable in finance, so you can do it here.*

There are a number of issues including a few that you pointed out. So, lack of consistent implementation of identifiers that are music industry standards, lack of a comprehensive music industry communication standard. So, in publishing we have ‘CWR’, in recorded music we have something called ‘DDEX’ that is widely used although not implemented consistently, and they don't “talk” to each other. So, if you want a comprehensive view of rights or ownership or metadata, for example I want to take Irving Berlin's ‘White Christmas’ and connect it to all 15,000 recordings or more that are sitting in Spotify. And you want to do that efficiently and accurately and consistently. So over here Irving Berlin's work is in CWR somewhere, and over here in Spotify they received 15,000 different DDEX files. They don't talk to each other. Michael Bubl  has probably 50 of them on his own, and he's going to do number 51 next year. So, things change too. But that relationship is something that the industry needs to figure out, and we're working with a number of large music companies specifically to do that. So, one is identifiers, second is these communication standards,

and the third is just large data gaps and discrepancies across even the largest organizations in the world. We may have a difference of opinion as to whether or not I wrote a song with you. A lot of people focus immediately on the discrepancy. The reason why I say it's a 2/10 is not discrepancies, per se, but that there's just data gaps everywhere. PROs do not know information about even the actual composition that they are representing. The reason is they primarily care about the data associated with the writer that they are actually collecting on behalf of. So, if there's a cowriter and one person is on ASCAP and another one's on KODA (Danish CMO), then neither is possibly that interested in understanding the broader actual composition. That's a problem. Labels historically have not had to know anything about the publishing stuff because they just pay a statutory rate to the publisher to license the composition. That's not the case anymore. You see, as we've worked with our clients we've seen these large data gaps, even in the largest music organizations in the world. I think getting the 2 - we don't want to get to 9 right away - we just got to get the 2 to a 4. We are trying to get more clients to join in on a shared data and data collaboration piece to fill in the gaps first, then you worry about the discrepancies, then you get into the fun stuff; algorithms to normalize the data, cleanse the data, etc. I think we just want to move 2 to a 4 and then maybe we can go from 4 to 6. The state of the data is actually bad. I view that, as a businessperson, as a huge opportunity. It's not that hard. Maybe we can show people how things can change and evolve, show them "a path" as I call it. It may not be ultimately the path that everybody takes, or that the industry decides to take, but we start somewhere. I think that's kind of the stage we are now. We're getting close to a 4 with a limited group of organizations. Forget whether it's Verifi or someone else. I think it's a very good thing because that means that our company and clients of ours, and others are thinking seriously about being data driven. They don't want to live in a 2/10 world, they want to live in an 8/10 world, how do I get there? Oh, there's a bunch of services here, one of them happens to be this company, let's go check it out. We're getting a lot more of that than when we started, which I think is great".

What are the pros and cons of blockchain as you see it?

Ken Umezaki: *"I believe this notion of distributed immutability is actually the thing that's the biggest pro of blockchain tech. It is not crypto specific or data specific or use case specific. So, I personally feel like that's actually a ubiquitous need in the*

business world. How the blockchain does it, is cumbersome (at least today). Because you got to have thousands of nodes, you have to have enough people motivated in operating those nodes. It's got some inefficiencies which everyone likes to talk about. Whether it's that the bitcoin mining spends more electricity than the entire country of Norway does in a year, or maybe more recently the expense of registering data, with the emergence of a lot of applications that are finance driven within the Ethereum universe in particular. Basically, gas fees going through the roof which crowds out a lot of other use cases for blockchain, (including ours by the way), because we're ultimately about data immutability and change management associated with large amounts of data. Those kinds of things end up being crowded out if you try to use Ethereum, because we can't pay 50 bucks to register a transaction right away. So, we wait for the bus, as they call it sometimes. And we wait forever, they push back at the bus because it's an auction in terms of getting your stuff to the front of the line. So, there's some very practical things that make many of the use cases that might benefit from a Distributed Ledger Technology from practically implementing it.

I also think, outside of crypto, possibly outside of web 3 and the metaverse there's been many attempts to take what some people have termed 'enterprise blockchain use case' and try to implement something at scale. It has not happened yet. We at Verifi are in a front row seat because we've always said the chain can do certain things for us, so I've watched this evolution, and there's been four hype cycles in my opinion. And guess what, no one actually found a great home for data centric blockchain use where a supermajority of the technology is actually the chain. So, we're ten years into the journey, or five depending on who you ask, and we haven't figured out a problem for which this is the solution. I think that actually says a lot about where we are in the evolution of what blockchain technology can do. I'm not into the hype, I'm into it being useful. Having said that, in this 4th hype cycle called the 'NFT hype', I am now seeing the blockchain technology and business community very focused on expanding the use cases beyond crypto, related finance and the metaverse. The last two years, it's really interesting to see super smart people who are actually working on how to find a large enterprise use case or use cases. You can see it all over the place. There are examples of people trying to figure out how to do mining/ transaction costs much more efficiently. Like, 'proof of stake' versus 'proof of work', whether it's Avalanche or Solana or all these other chains. That's actually happening now.

You have examples of organizations trying to figure out the data limitation of a block, because there's actually a limit to how much you can actually store directly on the chain. That creates lots of issues if you can't store stuff. Most of the NFT world, for example, hasn't solved this problem yet. Because the image or the video is sitting over here somewhere, and it's hashed onto the chain. But then its hash disappears, or the hash gets hacked, all kinds of weird things happen, so it isn't actually a non-fungible asset, it's actually a fungible asset that happens to have a non-fungible connection to the chain. That's not really what we were promising. So, I think there's lots of things like that, that are being worked on now. We're now getting to the point where there's some serious smart people starting to work on evolving the underlying value for the blockchain into this area. I think that's actually a really good thing. I'm actually really excited about that personally for my company because we're starting to get away from typecasting blockchain as a crypto. Having said that, it's still going to be another 5 to 10 years in my opinion before we see enough use cases. Those are to me some of the big challenges for the chain”.

To your mind: Is blockchain an ideology or is it a practical engineering tool? Or it is both?

Ken Umezaki: *“I think it's the latter. I think there's a lot of people who is like ‘let's stick it to the man’. That's why Bitcoin was created, to get rid of central banks or whatever. You can attach an ideology to the technology and a perspective, and maybe some people get excited. But you can do that with almost every form of tech. Maybe not as radically, but there's always some ideology or some kind of perspective that people jump onto and go ‘Oh yeah that's actually really cool’. You know, the internet's going to free information for everybody, the next thing you know Facebook and Google own it. Like, ok, what happened to free info for everyone? I do feel like you can connect ideologies, maybe it helps get people hyped about it. But the underlying thing that's really going on, back to what I said earlier, is sort of this idea of a distributed immutable place for information to reside that is both protected but also free from controlling entities. Again, you can attach any ideology or politics to that if you want, but there's value to immutability, I think. It normalizes the power structure around data. I think it's valuable in certain use cases. I don't think it's an ideology, I think it's a tool, one that's still emerging, and a lot of stuff still needs to happen to make it much more acceptable”.*

Is blockchain technology compatible with the current legal framework in the US and in Europe for music copyright? Will it work both for the master recording rights as well as the master works rights? These copyrights are fluid, ownership, and shares subject to change; how, to your mind, will that impact the effect of the blockchain?

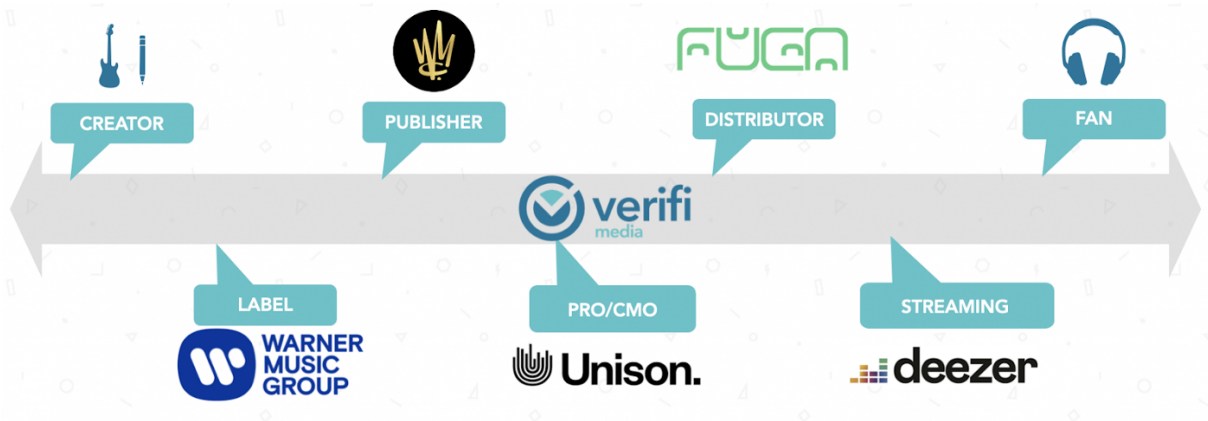


Figure 1 Verifi Media's Service. <https://medium.com/verifimedia/verifi-rights-data-alliance-explained-7a024a8c4675>

Ken Umezaki: “So, music rights, both in Europe and in US those are our core markets. Music rights are first and foremost a data problem. It has nothing to do with the blockchain. We just talked about it. There are data gaps everywhere. You want to be a comprehensive rights data service, meaning both works and recordings, as well as ‘who’ is involved. These are all examples of our clients by the way (points to the blog slide). Not just the ‘who’ as in the writer or the recording artist, but also the companies that are representing them across the value chain of recorded music. First of all, you have to think of it comprehensively in today's world, and it's a data problem. We have to aggregate the data from both the works and the recording sides, the two sides of the song as I call it. And then you also need to unify the data across the places where this data resides, and the places are listed here. So, the creators, or sometimes our management company, the label, the publisher, the CMO, the distributor, and the streaming service, they all have data, and it turns out they all have slightly different data or a lot of different views, like we talked about earlier. So, unifying them is a massive benefit to each of these organizations. Because they can do their job, their part in the value chain better. We talked about more revenues faster, all that good jazz, more efficient, all that good stuff. Better consumer experience, if you have better data, if you’re Deezer. Those kinds of things can be enabled by having comprehensive rights data. That's the sort of ‘why’. The ‘how,’ depending on who you ask, they all have different solutions. Ours is a partial blockchain solution, not a full

one. So, here is what we do, though this is a very shrink-wrapped version of the very complicated technology stack (image from blog).

VERIFI'S SEARCHABLE PUBLIC DATABASE

Verifi makes a subset of the music and participant data available in our public data base.

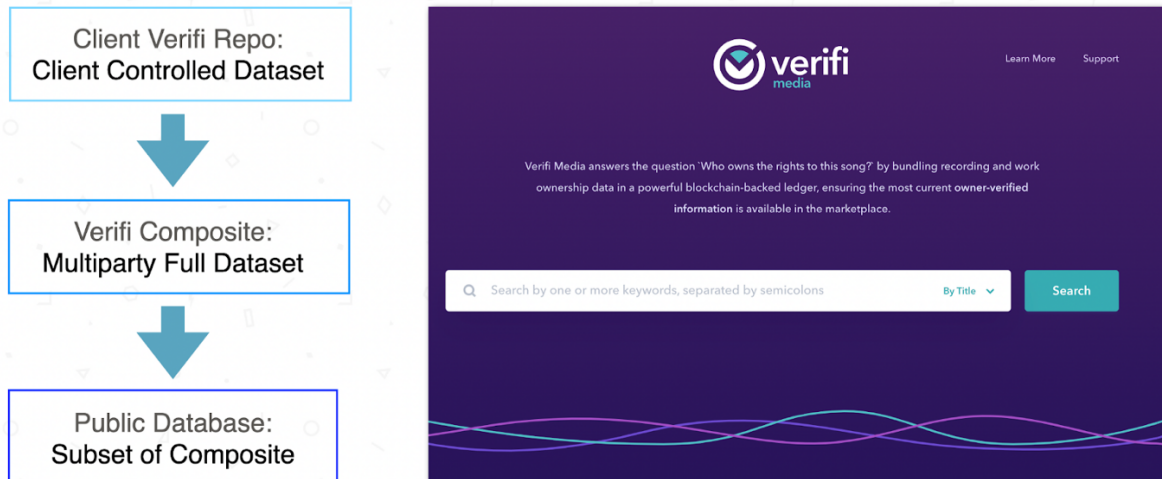


Figure 2 Verifi Media's database. <https://medium.com/verifimedia/verifi-rights-data-alliance-explained-7a024a8c4675>

But we have to do it in order for people to share data, we got to get him normalized so that sharing can happen within the technology. So, that's the first thing, we actually take a copy of every client data and we normalize it into our verified data schema. The point is then to share it with others and create a better truth. So, there's this idea of a Verifi composite, which is multiple parties contributing their data, us normalizing it, and kind of saying 'hi we think this is the best-known truth'. Warner and Warner Chappell and Deezer have all contributed their piece of the data, just as an example, and therefore we have a better truth. So that's part of it. Then the last part is 'oh I sold my rights to you, you should put that somewhere so that everybody knows that they should pay you now, or work with you now around these rights not me'. So, change management is built into the ability for these organizations to work with each other. So, they're notified if something happens that is relevant to their asset. That's not on this chart. The pieces that the blockchain helps us with for Verifi, are two things; one is we take the composite data set, and we hash it onto the chain. That way there's sort of an insurance policy. If I go away, someone's going to be able to take a look with the right set of keys at the actual data so that at some point in time this was the truth that we knew. That's one thing. The second thing it does is, it enables us to track changes, because tomorrow there'll be a different set of data. So, change management and

deployment of change, we do that within our service, but it's also a great place to keep track of changes. Over time, possibly even propagate those changes out through the chain to whoever is doing it. So, we are not a node-based cooperative, we are a data alliance as we call it, and it's called 'Verifi Rights Data Alliance' (VRDA). We're focused on the data; it just happens to be that our solution has a small component of blockchain in it".

How can blockchain work for the consumer?

Ken Umezaki: *"We as a company are not involved in consumer facing stuff. We're very focused on the B2B part. Over time, maybe. Other companies that are working on or have worked on things like blockchain back streaming services, as one's called Audius. That's out there. So, those are much more consumer facing things away from us. The problem that I feel they all have is the general music consumption problem. Isn't it funny how everyone listens to what everyone else listens to? I use that kind of as a joke all the time. That's true, right? We have a tremendously skewed consumption environment despite the fact that streaming is leveled it out, leveled the playing field a bit. It's still the case that the number one stream song versus the 100th stream song has somewhere between 10 and 50 times as many spins. That's in the top 100. We're talking about 80 million songs available on major streaming services (and growing), it's a huge tail. So, everyone listens to what everyone else listens to. That means to me that if you don't have that music on your consumer platform the chances of you scaling as a platform are smaller, not zero, but maybe significantly smaller. So, who owns most of the rights of the stuff that everyone else listens to? It's the large music companies, and in fact, a whole bunch of them have to be involved in letting you use it. So, my view on most of these sorts of technology driven improvements to consumer experience suffer from a content problem. They have to get this great content in. The only way you can get it is by getting licenses from the large music organizations that are relevant for that part of the content. They demand a lot to get access to this content. They know and whether that's lots of licensing fees upfront, which is what happens in traditional streaming services, or it can take two years to even get a deal done. So, if you're a startup, you can't really get there. It's a hard cycle to break. I don't think it comes purely from a technology innovation on the consumer side that's blockchain-based. In fact, the blockchain is very heavy. Ultimately, it's expensive. Back to what I said before, when you're talking about, you know, less than a penny per*

stream as the revenue model, it's hard to put that stuff on the chain. If you don't have good content and you need to build a technology that actually works. I don't believe other than the metaverse, which is to me a new market, and maybe some stuff happening in the gaming world, basically they're both virtual worlds. I think, other than there, where you can actually see things like token-based incentives happening in the gaming world. So, I actually think that in traditional 'audio only' or 'audio and visual music consumption' space, blockchain is not a great fit for it". At least for the foreseeable future.

How can blockchain affect the way music is monetized?

Ken Umezaki: *"Again, our thesis or our hypothesis is if we answer the question 'who' owns the rights to the song well in a systematic way and make that available to the clients and the broad music industry constituents. I guess we can help with the monetization piece. Again, it's not a blockchain thing, it actually is more about whether the data is comprehensive enough and that you cover enough geography. The other aspect of monetization, and I think this is where blockchain might work (still a might), is actually having a machine literate licensing protocol for music that is a broad licensing mechanic. So, if you think about it, the way you make money off of a music, at least in the commercial world historically anyways, you own it and then you license it or you sell it. It's less selling now, except NFTs. It's more licensing now because of streaming. The combination or the alchemy of those two things could or should enable a much more robust and accurate monetization regime for music. I do believe, even for us, the next real big thing is to focus on licensing. Now licensing is all about me letting you use the music for some period of time, for some set of uses, in some region. It's like, I've agreed to let you use my music in return for some money; it's a "trade". Some point in time it stops being licensed to you, let's say a year from now, and you can only use it and let's say Brazil. So, I now have permissioned you to use music that I own for some period of time. That's very mechanizable as opposed to putting it in a paper contract only. A lot of these economic terms can actually be put into a computer or onto a network. And blockchain is really good at this, or could be really good at this, except it's really expensive to put individual transactions onto the chain. The economy of scale isn't there yet, but it's coming. So, I do believe that on the transaction related use cases associated with music monetization, the chain or similar technology tools could be, down the road, extremely valuable in streamlining this.*

The other example I use, which is a little bit of a weird one, but let's say that you're in a game. And it's a 'shoot'em up game' and you're in a dark room, and there's a door and on the other side of the door is something you don't know. At that point in time, you want kind of spooky, quiet music as a gamer. You don't know how long you're going to be in that room because it's interactive. But you only need that music for that little period of time. Once you open the door and you go in, it turns out there's a gigantic dragon and there's 15 people trying to slay it. You've got or want some rock and roll anthem. So, this idea of an 'experiential-based' licensing, and it's things that people are actually working on now. The best way to do that for the gamer or the gaming company is - they don't want or need to license the entire 'Highway to hell' song, they just need it for that little period of time, might just be the chorus or just the guitar solo section - I call it 'micro licensing' or a 'use case specific licensing'. So, the granularity under which we're going to be essentially granting permission and getting paid for music using that example is a pretty obvious thing that's happening already. Today, a constraint is that you have to license all the music (most of the time), the entirety of it. But what if we could only license 15 seconds of it? Well, the more granular it gets, the better data you need on the underlying music. You need to have better data on who owns it, and you have to be able to manage the licenses in a completely different way than we do today in the music industry. That's where I think the chain, as an example, can be extremely useful assuming we can find an efficient chain".

Does blockchain have to be all-encompassing or can it work side by side with traditional handling of licensing, meta-data handling and reports in the music industry? Is it a stand-alone solution or can it support existing structures?

Ken Umezaki: *"I think it has to be part of the stack. Like, it's not a ubiquitous solution. The second thing is, I don't know what the right answer is longer term to be honest as to what the industry will adapt. I think it's coming; I hope it's us or some version of us. The other thing that needs to happen for any kind of technology to be deployed properly is obvious; it's large-scale adoption. You can build the most amazing thing, but if no one is using it that matters, it doesn't really matter. We're unusual I think at Verifi, relative to other modern technology solutions for music data, because we do have large music industry companies as clients and partners. We have access to substantially all of their catalog, they're paying us, they've agreed to share*

data with other people, which is kind of new in the industry, because you get better data back. That's actually more than half the problem. I can go through a hackathon and come up with the perfect music licensing module in a weekend that's blockchain-based. But is anyone going to use it? Don't you need to get enough people to use it so that you get credibility around it being something that's useful? Those are actually to me the real business dilemma ultimately. That's what leads to getting something to work”.

And what do you think is the obstacles for adaptation in the music industry? Is it politics, is it controversy?

Ken Umezaki: *“Well, I think I touched on some of them that I think are active ones. Let's not forget that digital is new to the music business in terms of really being the dominant monetization mechanism for the recorded music business. It's like five years, seven years, that's not that long. It's also hitting some of the industry segments, like publishing in particular, much harder because they weren't as well prepared for this rapid shift. So, there's a little bit of just catch-up time almost and sort of mindset shift that needs to happen. I also feel like, we've touched on the technology solutions being relatively nascent; Verifi is six years old, and still unproven at scale you could argue. I think even the new solutions have to be ‘marinated’ and mature over time. I think there's a little bit of that. The last piece, back to my data literacy, I think organizations need to be better aligned with having data literate people in decision making positions within organizations, and in larger organizations in particular. The reason why we focused on the “big boys and girls”, as I call it, is getting them to actually say yes to our value proposition is what's going to drive our ability to keep growing as a company with medium sized organizations etc. It's a very top-heavy industry, you know. Top three labels control around 60% of the content still, and they're very good at it, and they're very important, and they will be that way for a long time despite what other people might say. So, they're not going away. But without them it's harder to get at the indie organizations and there's many of those. There are over 10,000 labels in the world that are big and small, there's only three big ones that take 60%. So, it's got the same kind of curve like ‘long tail’. Anyone can start a publishing company, and same deal with the long tail in publishing. Collection societies, one per country, roughly if you look at the map. Everyone has a distinct set of data orientation, and I would argue they have a lot of work to do to catch up as well”.*

Additionally, Ken sent an email with similar and/or competitive technologies to blockchain that also might be useful in the context of the music industry:

There are alternatives to blockchain technology that are very similar which are also possibly useful tools for music data.

We use, in a limited capacity, QLDB from AWS.

<https://101blockchains.com/qldb-vs-hyperledger/#prettyPhoto>

There is also another emerging tech called DAG.

<https://alephzero.org/blog/dag-vs-blockchain-they-are-not-as-different-as-you-think/>

As alternative tools for addressing large datasets, these 2 approaches stand out to us.