

The Truth About Blockchains in the Music Industry

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Introduction

Widespread adoption of some kind of blockchain technology is inevitable for all undertakings that touch or concern money, rights and transactions. The music industry is no exception. History has shown that efforts to resist technological change do not turn out well. In the long run everyone is a stakeholder. Blockchains will affect not only the parties who have a financial interest in the distribution of music; e.g. artists, composers, producers, labels, rights managers, digital service providers (DSPs) and performing rights organizations (PROs). Blockchains will affect listeners and fans, in how they experience and interact with the music. Blockchains will affect our culture, as music takes its place among the Internet of things (IoT).

The truth about blockchains in the music industry is not easy. It involves digging into the details of what blockchains are about. It involves going down rabbit holes in search of answers. We can all benefit from imagining how it will go. Once core blockchain concepts are understood, then we can have a meaningful dialogue about the way forward without hype.

The Music Data Technology Arms Race

Currently there is an arms race in music data technology. Every month it seems there is a new major announcement. Peer Music is developing a blockchain. BitTunes has one. There is Revelator, Resonate, RightsShare, Consensys (Ujo), Alexandrian, MediaChain and the Tao Network. There are different groups creating different apps and platforms that are natural competitors with one another. Patent applications are being filed and marshalled in readiness to claim digital turf and exclude competitors.¹ Many sides already are fighting it out in a battle that is still largely misunderstood.

Our appreciation of the potential benefits and limitations of blockchains and blockchain-enabled solutions is floating in the fog of this war. This is reminiscent of the videotape format wars of the 1970s and 1980s where Betamax (Beta) was pitted against Video Home System (VHS). It is typical of how new technologies evolve, and how winning formats emerge, but it is counterproductive for the music industry which has a recent history of letting its value diminish through a failure to cooperate with consumers and through misguided efforts at digital rights management.

Problems Worth Fixing

¹ <http://www.coindesk.com/looming-war-blockchain-patents/> (accessed January 20, 2017).

For a blockchain solution to work effectively in the music ecosystem, everyone should be on it. Similar to social networks like Facebook, Twitter, Snapchat, etc. the more users that are on the network, the more powerful the network becomes. If the music industry is moving in the direction of solving problems, then consolidation or interoperability between data networks is crucial, not fragmentation. The industry must come together to agree upon and adopt data standards for identifying rights. There is no reason why legacy systems cannot co-exist during the transition period. After all, the transition likely will take a very long time.

Most successful projects start with identifying a problem and the requirements to fix it, not some cool piece of technology. However, occasionally, a piece of technology is so powerful that it can cut a swath through everything standing before it. Potentially, blockchains are that kind of technology; and the music industry has lots of problems. Problems that face the music industry that need to be fixed include data overload due to streaming; inefficiency of making micropayments; data in silos; delay in payment; delay in licensing permission; failure to track monetization; inefficiency of granting micro-licenses; need to move away from advertising-based revenue models for digital; black boxes for payment; etc. In the years to come we will see back end blockchain-based solutions emerge that increase efficiency and reduce frictions and transaction costs. There will be some collateral damage of course, as parties who benefit from opaque business practices, and unnecessary middlepersons, are eliminated. Waste will be reduced. This is a good thing, really. This seems likely to happen regardless of whether the change is caused by blockchains, or from consolidation due to marginal players becoming economically inefficient, or from information becoming more readily available. If legacy systems can co-exist with these new blockchains during the transition period, then from a macroeconomic point of view there is no reason to fear blockchains, or even to resist.

The outlier to all this, however, is that blockchains can put tools into the hands of people who can use them in a manner that is disruptive, without having much of a plan beyond their immediate goal. There is not much that can be done to stop it. Indeed, based on past experience trying to shut down file sharing, it is probably a bad idea to try to stop it. Better to get ahead of the curve and head it off. Thus it is important to keep a watch on what is happening in the open source blockchain community, to figure out what the needs are, that are being filled. In turn, these needs will become the problems that the music industry can rally around, to fix, rather than to prohibit.

Data Standards – First Things First

In order to use blockchain technology effectively – regardless of the type of blockchain – the music industry will have to come together to adopt data standards for identifying rights. This means, to clean up, standardize and enforce the use of standardizations in music rights management. The enforcement part is simple. If your data is incomplete or corrupted it will be frozen out of the system. With standardization comes interoperability.

The 2014 failure of PRS's ambitious Global Repertoire Database² left many people wondering how this would happen but it seems that the next rallying point for such a cause already is blockchains which need standardization to operate. Like any computer program or script, a blockchain will not function properly if ambiguity is allowed in.

Leading this charge is the Open Music Initiative (OMI), organized by the Berklee College of Music, Institute for Creative Entrepreneurship. One of the key members of OMI is Dot Blockchain Music (dotBC). OMI describes itself as a non-profit initiative of leading academic institutions, music and media industry organizations, creators, technologists and entrepreneurs, creating an open source protocol for the uniform identification of music rights holders and creators. OMI stresses that it is not about building a database or a specific product. The outcome is intended to be the establishment of application program interface (API) specifications to enable industry platform interoperability.³ It is about building API tools to build a global music rights database. The for-profit company Monegraph⁴ is serving as dotBC's initial API plugin bridge – to the bitcoin blockchain. That is, Monegraph is intended to be the user interface for rights holders to access revenues from exploitation. The idea is that rights holders would set their own prices and would be able to select from a menu of sale, licensing, resale and remixing rights. Users would be able to purchase directly, without the need for middlepeople or brokers.

Thus in its own words, dotBC's project goal is “to design and develop an open framework for decentralized interoperability for the music ecosystem”.⁵ This is to be achieved by building a suite of open source software that puts a basic amount of information about a music track (essentially, the composer, artist, producer, publisher and label) - which dotBC calls minimum viable data - into a ledger file that is designed to be “pluggable” in that it can be plugged into a blockchain. The reverse also would be possible, insofar as if the music was unplugged from the blockchain it could be rendered unplayable. However, while setting universal data standards is of course a great idea, the implementation of gatekeeping functions – as a corollary to data standards – should be approached with caution. We should recall that history tends to repeat itself. If a music delivery system – any system – locks up when it is not being used according to how it was designed, it will not take long for music consumers to find a workaround or another system that likely involves free fire sharing. That is, music consumers can easily go back to torrenting the works if they are locked out of a blockchain. The solution is to make legal, financially sustainable usage of copyright ridiculously easy and ubiquitous so that the incentive to infringe the works is eliminated, rather than focussing on how to lock out consumers.

Blockchains – Core Concepts Worth Knowing

² <http://musically.com/2014/07/11/prs-disappointed-at-global-repertoire-database-collapse/> (accessed January 20, 2017).

³ <http://open-music.org/#open-music-initiative-1> (accessed January 20, 2017).

⁴ <https://monegraph.com> (accessed January 20, 2017).

⁵ <http://dotblockchainmusic.com> (accessed January 20, 2017).

Let us go back to basics in this discussion – the beginning – to understand the problem that blockchain technology was intended to remedy. It is worth the trip.

The history of blockchains is surprisingly brief. It dates back to 2008 when a disarmingly thin research paper was first published on a newly-created Internet domain. The domain was called bitcoin.org. The paper was entitled “Bitcoin: A Peer-to-Peer Electronic Cash System”. It was credited to a mysterious developer using the name Satoshi Nakamoto (or more likely, a group of people - the word “we” was used in the paper). Satoshi Nakamoto’s paper built on prior theories in the areas of encryption and peer-to-peer networking.

The genius of the paper is that it solves the so-called double-spending⁶ problem for digital currencies by using a peer-to-peer network - i.e. where financial transactions using digital currencies can be verified without the use of a trusted authority (e.g. a conventional bank or a clearing house) or a central server (i.e. a central computer hub that is able to keep track of everything). The paper’s abstract states:

A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

Thus, blockchains were first conceived as the basis for a digital currency (bitcoins) that is not a fiat currency based on or tied to a standard such as gold, or guaranteed by any person, government or institution. In a sense, the digital currency is anarchistic because it is self-created and self-guaranteed. The authenticity of the currency is guaranteed by blocks that are “mined” by bitcoin miners who – for a reward in the form of receiving bitcoins – solve encryption puzzles about the blocks – proving them – using massive amounts of computing power, essentially creating an immutable chain-of-title. All of this happens in a frictionless, distributed, always-there-and-never-turned-off, peer-to-peer manner. There are no intermediaries. Transaction costs essentially are zero (i.e. aside from the cost of running a computer attached to the Internet and currency conversion fees if a payment is to be transferred from a digital currency to a fiat currency like dollars). There are no gatekeepers, referees, or oracles. There are no fact checkers. There are no auditors. There is no tech support. There is no recourse within the system if things go wrong. The system moves forward as an autonomous, digital entity, so to speak, by rewarding its miners – the ones who keep the system intact by verifying the

⁶ The double-spending problem is that digital files easily can be duplicated; thus digital coins potentially have an inherent flaw where they can be spent multiple times.

authenticity of newly-created blocks of transactions. The authenticity of a block simply is that all of the peer-to-peer transactions within it have occurred.

Now We Have a Self-Guaranteed, Immutable, Distributed Leger – So What?

In not-much time, the blockchain concept has become the basis for an explosion of new ideas, because essentially it runs a ledger, and a ledger can keep track of anything - from diamonds to real estate, to electricity to music. Moreover, since 2008 the original bitcoin blockchain has spawned newer types of blockchains, using the same concept of an immutable, distributed ledger, but written in different and more powerful code that often is Turing complete (i.e. computationally universal) in that given enough time anything can be computed using any computing language. In turn, this means that in addition to keeping track of transactions, the blockchain ledger items themselves can be autonomous self-executing algorithms that can produce varying results based on varying inputs (sometimes called “smart contracts” because of their ability to negotiate in real time with other smart contract entities). Despite the name, smart contracts currently at least – are not that smart. They automatically execute commands. That’s about it. They are hopeless when it comes to combining logic, cognition, emotion or empathy, which are the hallmarks of (artificial) intelligence.

Hype and False Promises

As more and more people have started realizing that the underlying principles of blockchains potentially are transformational, this of course has led to hype. Promises of new technologies tend to be overblown. For example, we are still years away from being able to roll-out blockchain solutions for the music industry’s DSPs because of inherent latency issues, where currently, blockchains are only able to process transactions at a fraction of the rate achieved by credit cards. To put things in perspective, if suddenly a current-generation blockchain such as bitcoin or ether were to replace current systems for tracking music streaming, the blockchain would choke and die, immediately.⁷

It is natural for people to get excited about what new technologies can offer. People tend to exaggerate. They tend either to be overly optimistic, or overly pessimistic. Either way, this leads to disenchantment as results are not delivered fast enough or well enough. All of this is normal. The exuberance of discovery naturally gives way to disenchantment as reality sets in; for example, incumbents who might be threatened will

⁷ Currently the bitcoin blockchain can only process a few thousand transactions per second (<https://blockchain.info/charts/transactions-per-second>). Even if future blockchain generations could process substantially more transactions per second, it would be difficult for them to keep up with each micro-transaction worldwide as listeners accessed streaming music services and the blockchain(s) on them were required to keep track of each transaction for payment purposes. Either this would cause a delay in receiving the file for the listener, or an unacceptable delay in processing time on the back end meaning that a double-payment risk would be created (i.e. the song could be listened-to multiple times before the blockchain-enabled streaming service was able to track the usage). Newer, permissioned blockchains are said to be achieving significantly higher rates, but still, they are in development and remain untested in any large, music-based rollout.

try to set up barriers to entry for new players. Depending on how far down the rabbit hole you have ventured, we are currently either in a period of hype, or a period of disenchantment caused by hype.

The hype around blockchains involves a question of perspective. The question essentially is existential. It asks why and how blockchains ought to have value or meaning. This is the same kind of question asked when considering the value of all new technologies: whether it is more valid to identify a problem that need to be fixed so as to build technology around the problem, or better to build a solution then go out to find a problem for it.

In other words, the blockchain hype involves saying, “we have a great new solution called blockchains, let’s go find some problems for it”, rather than saying, “we have all these problems, how can this blockchain-thing help us?” Thus, once the blockchain analysis is centered on identifying essential problems facing the music industry, then we can usefully look to blockchains to see what they can offer to fix those problems.

What is at Stake

There is a lot at stake. Putting all of the music industry’s eggs in one blockchain-basket is potentially frightening. It would be an epic disaster if the music industry rushed to embrace blockchains, then got hacked in some as-yet-foreseen manner. According to statements from INTERPOL and from researchers with the cyber security firm Kaspersky Labs,⁸ uploading malware to a blockchain could make it extremely hard to get rid of. As new batches of transactions are verified, they are uploaded to the blockchain. Because the blockchain is decentralized, that data is also downloaded to the computers of everyone running the software. The problem is that all kinds of files, not just bitcoin (or other digital currencies running on other blockchains), can be uploaded to the blockchain, including malware. Proposed solutions have involved filtering pure data uploads from those containing transactional information. However, censoring what enters the blockchain is likely to raise the ire of the more libertarian-leaning supporters of blockchains. Security issues are key questions going forward.

The nightmare scenario is that somehow blockchain data could become corrupted or scrambled so that, for example, digital cue sheets or tracking statements were no longer reliable and nobody could figure out who to pay or how much. These types of concern are shared well beyond the music industry. They are the types of concern that the fintech industry is rushing to meet in most sectors of the economy as blockchain-led promises of cheap and virtually-frictionless digital transactions are exposed as veiled threats. If we cannot trust that our digital currencies and our transactional data are rock-solid, then we cannot trust the system. Trust is said to be an institutional feature of any financial system.

⁸ <http://motherboard.vice.com/read/the-bitcoin-blockchain-could-be-used-to-spread-malware-interpol-says> (accessed 16Jan17).

Thus as we move forward to assess how blockchains can fix problems in the music industry we quickly reach a fork in the road. That fork is caused by the question of trust, which means identity and accountability. For some aspects of the music industry, identity is not necessary or even desired. For example, not all fans will want to divulge their identity in order to listen to a song (yet an artist and label would love to know as much as possible about the fan, for marketing reasons, tour planning, etc.). Most fans simply want permission to access the music⁹, and perhaps get the lyrics, photos, production credits, songwriting credits, and maybe earn a little bit of digital cash in the process to spend on the artist's swag or to get preferred access to the artist at meet-and-greets, etc. Conversely, licensors such as record labels and PROs will want to have a full audit trail from licensees such as DSPs – with as many metrics thrown in as possible. Yet, one of the underlying features of blockchains – at least the bitcoin version – is that they are anonymous and nobody is accountable because they are fully decentralized. By design, the only parties to the transaction are the two transactional entities – the ones at each end. There is no middleperson. This feature was notorious in the early days of bitcoins, as digital currencies became synonymous with the Dark Web and illegal transactions.

The Truth About Blockchains

The truth about blockchains is that two, very different types of distributed ledgers are bound to gain traction in the music industry:

1. The first are blockchains that have the capability to allow for central oversight (i.e. they can be regulated). These are what we could call the fintech blockchains. They are the types of blockchains that are being developed for the financial sectors – e.g. the banking and securities industries; and for supply chain management. They are identity-based (permissioned) blockchains that do not need miners. The parties who access the network already know each other. This is where the majority of financial technology investment is occurring.¹⁰ These permission-based blockchains can run significantly faster than anonymous (permissionless) blockchains because they do not need to be bogged-down with mining activities needed to verify the authenticity of blocks.
2. The second are blockchains that cannot be controlled (i.e. in the sense of being regulated). They can be “forked”, in that going forward they can be given new rules (commands) for how they operate, but this will not affect anything that occurred previously on their blockchain – the previous blocks will remain immutable and anonymous. Their development is occurring largely in the open source coding community. Validation of transactions is achieved through

⁹ The music itself will not be on blockchains any time soon, because current generations of blockchains are not robust enough to handle that much data. That said, it is foreseeable that blockchain-based music distribution could follow the path of peer-to-peer distribution where bits and pieces of each song or video are stored on the hard drives of all (or most) users and are hunted-for in real time much like how BitTorrent and other file sharing apps currently function.

¹⁰ For example, the blockchain consortium, R3. <https://www.ft.com/content/aeb63b96-d64b-11e6-944b-e7eb37a6aa8e> (accessed January 20, 2017)

blockchain mining, not through external form of trust. The possibilities for growing an instant, direct, artist-fan connection are limitless. Expect the unexpected; e.g. plugging music into the IoT and getting masses of devices to become artists; disengaging the creation of music then reassembling it in virtual reality. This is where the cool kids will gather.

Thus, the truth is both mundane, and exciting. The identity-based blockchains being developed by fintech solution providers have most of the money behind them. They are “back-end” solutions in the sense that they are intended to stay behind the scenes. They will not have much effect on user experience. They are the new plumbing pipes through which data can flow, or the new rails that can carry the data, at a fraction of current transaction costs. However, this is not where the cool kids will gather, who are into writing and sharing new code that addresses their own wants and needs for new forms of cultural, music-oriented connection.

Final Thoughts

Blockchains, and any smart contracts residing on them, are not actually smart because they do not possess cognitive empathy. They do not understand nuance and have no ability to judge. Therefore presently, and well into the immediate future, anything involving nuance or interpretation will have to be done elsewhere – offline and/ or through person-to-person interaction.¹¹ The result is that, to the extent trusted arbiters such as PROs and other entities that administer copyrights are needed in the music industry to develop and maintain relationships or to sort out problems between stakeholders, those trusted arbiters will continue to be needed. It is unlikely that such entities will be replaced by blockchain technologies any time soon. Rather those entities likely will co-opt blockchains, using them as a cost-savings tool to weed-out inefficiencies. Thus identity based (permissioned) blockchains do not pose any real threat to an efficient music industry status quo, whatever that may be defined as currently. However, they should not be confused with anonymous (permissionless) blockchains that need miners, which are the true drivers of innovation and, depending on your perspective of whether there are problems that can be fixed by blockchains, are the true potential disruptors and anarchists’ tools. Using open source tools, blockchain enthusiasts will continue to find new, joyful and enriching ways to connect with artists, the music, and each other, one-on-one, exuberantly beyond the reach of buzz-killing music intermediaries.

¹¹ That said, as artificial intelligence develops one day this may change, but we are nowhere near there yet.