

Musicoin: Free Music With Blockchain

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Abstract. This paper describes Musicoin, a special solution for musicians and music listeners, running as a purely decentralized transaction system to enable creators to define their own licensing policy with ease-of-use tools together with coded contracts onto a blockchain, share their music universally and earn fairly and transparently. For music listeners, the system can give them freedom to access global music with digital currency forever, without worrying about the pay-wall or license borders. Since everything from creation to listening becomes transparent, the whole music economy can be more trustworthy with equal tradings and dramatically amplified with open innovations.

There is a song in all of us. It's there, waiting, until one day it's playing for all the world to hear. And you know it, and it knows you.

The music industry has withered and become corrupt within the last 15 years [a list of like 10 citations here would be really helpful]. There is a growing awareness that the music industry is crippling creativity: suppressing the new in favor of the formulaic, the controversial in favor the safe; opting to satisfy most people with something which is, simply put, only satisfactory. Rather than daring to lead, it has decided to follow. Rather than asking the artists to speak, it forces them to listen.

There's a dream to unlock the potential that has been hidden. Millions of artists from all over the world are waiting. They are waiting for the world to hear them. They are waiting for fairness. They are waiting for all of us to come and find them. Similarly, millions of listeners are searching. They are searching for inspiration. They are searching for the *new*. Musicoin is here to connect them – directly -- in a whole new way.

Problems

For an average person music comes from a sort of black box, from nowhere. User sees distributor only, has no contact with actual creator. This black box comprises of few top brands that are maybe known to user and lots of smaller ones that users never heard of. These brands “represent” creators (or even manufacture them). The problem here is that creators have

actually no choice whether they want be represented or not - they must comply to enter the market.

Big labels hold licenses, therefore being an actual monopoly, they are the main reason of corruption of this industry and cause of an ultimate future fall of the current scheme. To add insult to injury due to resources held by this monopoly there is no chance for smaller labels to effectively undermine this copyright holding scheme¹.

However, those who watch carefully can already spot cracks that started to appear on the monolithic face of big labels. Despite reported growths in streaming and adjacent areas (electronic distribution), if calculated against current operational costs, numbers diminish from year to year². This causes increasing anxiety and panic moves in industry that has apparently no idea what to do with this problem. So, instead of changing schemes they harden their politics with respect to advance payments and licensing fees³. This would probably hold for next few years before the climax.

Holding licenses like hostages isn't the only issue here. As in general the only creative move of decision makers in big labels was choosing between managerial studies on Harvard and Yale they have little to no understanding what creativity actually is. Thus they hamper interesting and innovative artists via "Chilling or Catalyzing" effect. To put it in clear text - write off everything that does not conform, censor yourself or die.

Suppression of innovation isn't the only sin to be attributed to monopolistic labels. What is more sad, due to restrictive license agreements, artists are reduced to poorly and not timely paid forced labor⁴. Cash flow from user to artist is never transparent nor explainable in real efforts. It's arbitrary and obscure. Artist must just produce acceptable, neutral music and conform to payment habits of the label. Which is why a need of fair trade is mentioned above.

With present scheme there are also issues independent from big labels. In last year streaming became one of leading distribution channels of music due to popularization of mobile devices and data exchange in IoT. However data transfer isn't free, due to ancient architecture of Internet and protocols serving it it's actually very expensive. So expensive that music suppliers serve it in quality lower than in pre-Internet era. As many people cannot remember so distant past they hear no difference. But the fact remains - they pay for low quality product without even being properly informed about it. More, this practise hampers perception of music in a way that causes most of productions sound almost the same.

¹ Pitt, Ivan L. "Direct Licensing and the Music Industry.", p. 180.

² "IFPI Global Music Report 2016", <http://www.ifpi.org/news/IFPI-GLOBAL-MUSIC-REPORT-2016>.

³ "The Innovation Paradox: How Licensing and Copyright Affect Digital Music Startups", <https://musicbiz.org/insight/the-innovation-paradox-how-licensing-and-copyright-affect-digital-music-startups/>.

⁴ "DISSECTING THE DIGITAL DOLLAR", <https://themmf.net/digitaldollar/>.

We need better music - it's actually just around the corner. The only thing it needs to appear in full lights is access to wide public and fair incentivization.

We need to fix the industry, or rather offer a replacement of this current, obsolete scheme. Replacement that will take care about long forgotten grassroots of this area of human activity. That will return full power over creations to creators and introduce fair trade rules.

New Model

The most prominent pathology of the current system is its unfair nature stemming directly from monopoly of big labels. Thus, while opening a blockchain based label would seem a no brainer, as it's usual with no brainers, it would not yield any innovation. More, if successful it would probably corrupt very quickly.

To return actual powers over creations to creators and make a system where all participants can benefit according to their actual efforts, a brand new model must be worked out and applied. Model that would ensure that no participant has a privileged position just because of waving a paper with "license" word written on.

This does not mean that licenses should be excluded from the new model - on the contrary, licensing system is its crucial component. What differs is no support for parasitic entities as access to public and funds is direct. More, the model is open and free to enter, thus no self proclaimed bouncers can exist.

The most essential element of the new model is a ledger that will keep track of every event in music piece's lifetime - from first publication, through sharing, sublicensing, remaking up to it's expiry if set. If not, the ledger will record changes indefinitely.

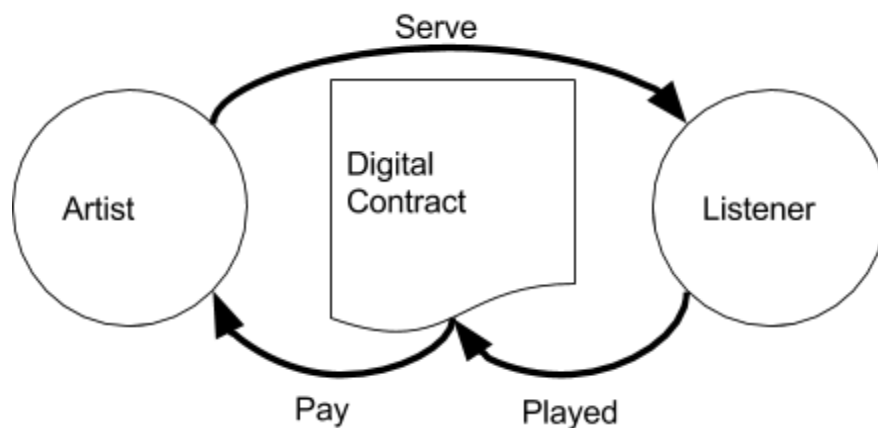
The above would sound crazy even few years ago, but with advent of blockchain and its successful verification as a reliable medium it's now absolutely possible. Blockchain has also multiple qualities that would further benefit the new model.

- It's borderless, or rather borders independent, thus enabling worldwide spread of this idea;
- It has no central authority, thus there is no entity that could authoritatively alter its functions;
- It's privacy-proof. In the new model privacy should be enforced to let both users and creators decide to which extent they share their life with others;
- It's most tamper-proof of human creations - there is no actual way to change the ledger even a bit without conscious consent of 51% of users. Which is extremely hard to accomplish as Ethereum's case showed most prominently. This ensures that entries into the ledger will be genuine and independent from will of even big players.

- It's transparent if designed so - all transactions and interactions can be clearly visible in the ledger. The new model would encompass this transparency to ensure as full as possible information about internal chain's transactions - in such an environment no monopoly has a chance to survive as they base their existence on information control and rationing.
- Blockchain is able to handle the complexity of this industry. In this particular case of music related issues it can not only handle but also augment it by making a link between human relations modeled by contracts and technical layer of actual content serving.
- It is also important that smart contracts in blockchain can be used to add new functionality without affecting the core system.

Pay Per Play(PPP)

We propose an atomic digital operation as the center of the new model. Pay Per Play (PPP) is to assure every execution of a music, which is played in listeners consensus, can be accounted and paid. The minimum operation can be articulated like this:



Many conventional ways can't really ensure PPP can be executed, however with blockchain, this concern can be addressed. Since it's a micro-operation putting to every nodes, it can become both technical and social norm.

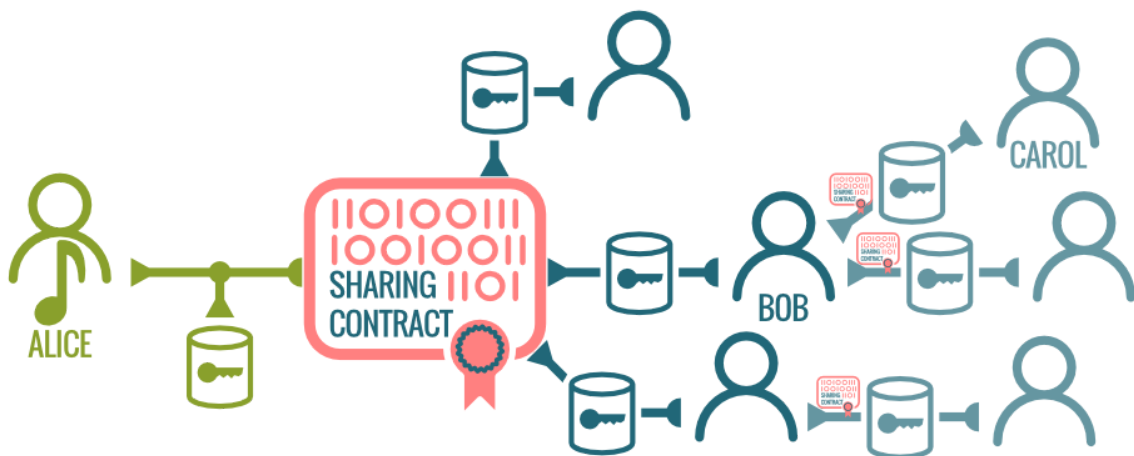
Contracts

Eventually, an immutable blockchain will carry all PPP records and form a huge ledger to assure the execution of this atomic operations everywhere. Based on this assumption, the new model will be possible to build up with four essential and one optional layers built into the blockchain in form of contract and/or protocol, in general they are as follows:

- **Sharing Contract** referred hereinafter as **SC** is responsible for content flow and exchange and is basis for further layers;
- **Transfer Protocol** (optional) referred hereinafter as **TP** - bounds music pieces data bilaterally with blockchain records and manages data availability to ensure fast and reliable data exchange;
- **License Contract** referred hereinafter as **LC** - this layer follows created music pieces and interact with other contract to ensure that music creator's intent is terms of license conditions is followed;
- **Catalog Contract** referred hereinafter as **CC**
- **Playlist Contract** referred hereinafter as **PC**

Sharing Contract

To assure this, we design a contract (we call it “Sharing” contract), to encourage the high availability of content:



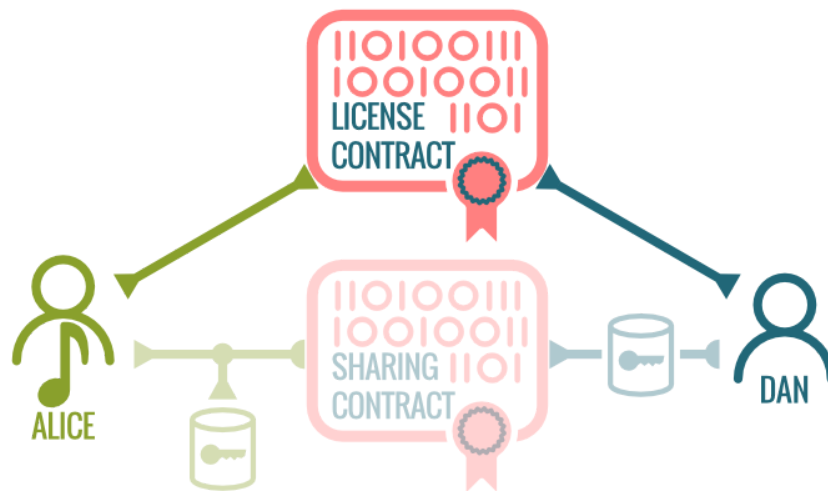
1. Alice publishes a digital asset with a “sharing contract”
2. Alice also serves the first encrypted copy of the media content, linking her wallet address (?) to the contract
3. Bob executes the contract and gets a copy of the content from Alice via a P2P network, and paid her, the content will be unlocked by private key
4. Bob can choose to serve an encrypted copy of content as well, by linking to the contract
5. Carol executes the contract to request copy of the content from either Alice, or Bob, and paid the one served her, she can use private key to unlock the content

This design will bail out the long time demonized p2p music sharing as an infringement of music copyrights. Because p2p network ensured highly availability in technical design, even under heavy scrutiny under legal policing. With this contract, every can become a legal sharer to serve

as content node, and fairly paid because they help maintain a solid resource. In theory, the contract has enabled a very raw network for resource sharing, which is legal in many jurisdictions for whatever they share just because they are sharing unlisted content(not like Pirate Bay).

License Contract

It's not enough, nevertheless. We propose contract 1 ("License" contract) here to amend the legitimacy of "Sharing" contract.

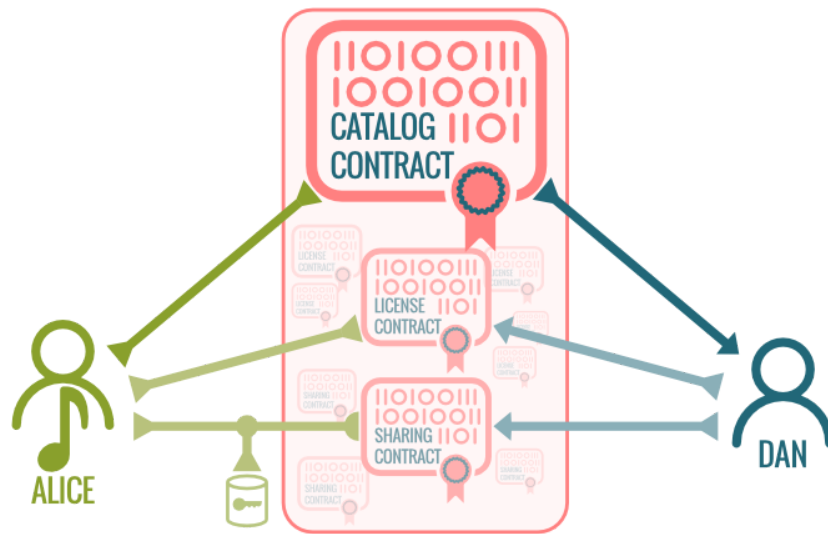


1. Alice add new contract above "Sharing" contract, called "License"
2. She regulated her content can only be accessed via the "License" contract
3. Dan executed the contract code and collaterally executed "Sharing" contract for the content
4. Dan got the content copy from Bob, and verified
5. Dan paid Bob for the "Sharing" and paid Alice for the "License".
6. Based on the contract 0, Dan can become a contributor to "Sharing" contract as well

This contract is the core model of the whole Musicoin, most of the future transactions will be based on this model. Based on this hypothesis, the implementation of this part should be very considerate to fit the data needs of music creation process. The policies in this part of code, should be defined as a template to be easily reused by creators.

Catalog Contract

Above “License” contract, we defined the 3rd contract type, called “Catalog” contract. It’s a stock contract that every copyright holders would love to connect, since it’s the open interface to public to look for any licensed content with validated ownership.



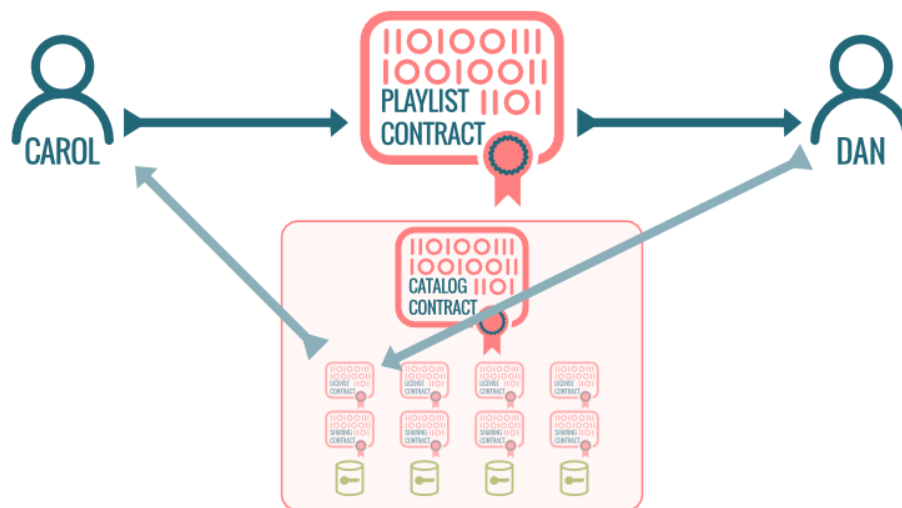
1. Alice posts her own content using “License” contract, also linking to “Sharing” contract to ensure content sharing. She is now accessing another contract called “Catalog” with a little payment
2. The payment will be used as validation of ownership via an online/offline process. Once it’s validated, laymen users will be able to view them, e.g. Eric found it
3. Eric decided to consume Alice’s new music, he will go through Contract 2 and 1 to make sure he can really get the content correctly, and he will pay for that

The catalog contract will enable a “social consensus” on the ownership of content, which Alice claimed via the contract, but need some crowd sourcing to verify that. This process may go offline and take some man powers to finish it. The finalization of the verification will be accessible as easy as Wikipedia, to developers, it should be as crystal clear as Github. With open catalog, we can see through the whole music world, to understand each license terms, to know the price and market trend.

Similarly, other re-creation and/or remixing of the original contract will be linking back to the original creator’s contract, the value chain like Sharism described, will be traceable like RT chain in social media.

Playlist Contract

As playlist is becoming the de facto standard in Internet age, user experience is strongly relying on this method rather than traditional albums. The last contract template in Musicoin is “Playlist”. For any curators, either musician, publishers, labels, a popular DJ, consumers, or even machine algorithm, they can all curate a playlist and put as a contract resembling the “Playlist” template.



1. Based on the open catalog, Frank compiled a playlist, and posted with “Playlist” contract
2. Grace trust Frank’s playlist can bring her more joys, she sign on the playlist contract
3. For every content Grace consumed, it will go through the “license” contract and “sharing” contract to be accessed and paid

Privacy and copyright enforcement

Same as to public media, payment to music today is becoming a threat to users’ privacy. As same call, we believe music consumption should return to the track of anonymous consumption⁵. In Musicoin, the privacy model is already being embedded in blockchain⁶, so it’s basically assured in one layer. However, there maybe an argument on creator's’ identity, since eventually

⁵ R. Stallman. “Publishers must let online readers pay for news anonymously”
<https://www.theguardian.com/technology/2016/sep/01/online-publishers-readers-ad-block-surveillance-donate-anonymously>.

⁶ Nakamoto, Satoshi. “Bitcoin: A peer-to-peer electronic cash system.” (2008).

their public key will be exposed to open catalog which being identified as “who is who”. However, this model has assured the utmost privacy of most consumers, which is more sensitive to modern world.

On the copyright enforcement part. Since blockchain would eventually become the most trustworthy open place to view any licenses about any music. The usage of the music should all(of course more accurately, mostly) flow into blockchain to be quantified and measured. For this solution, we won't talk about the copyright enforcement part, but more on the incentives that enable users to realized it voluntarily.

For music services in the future, Musicoin blockchain would be much easier to interact with copyright owners(and most probably they are musicians themselves in the future). E.g. a music video service can easily put a link on their page to let users know their viewing times will be directly link to a musician's contract with just a click away.

Network and incentives

To make the model really work, we need a network to sustain it. To set a genesis to a blockchain is easy, however, how to recruit more nodes to join with the protocol-level of consensus is far more relevant. The consensus should include all stakeholders and eventually make everyone beneficiary of the whole network.

Musicoin blockchain will be built up with early adopters(avant garde musician and avid listeners) and extends itself organically. With more publications in coded contracts posted to the blockchain, more users can access them and listen them then post back as a transaction. Since early adopters would be foreseeing the future of the whole chain, their activities would be much forward-looking and enthusiastic to assure its health.

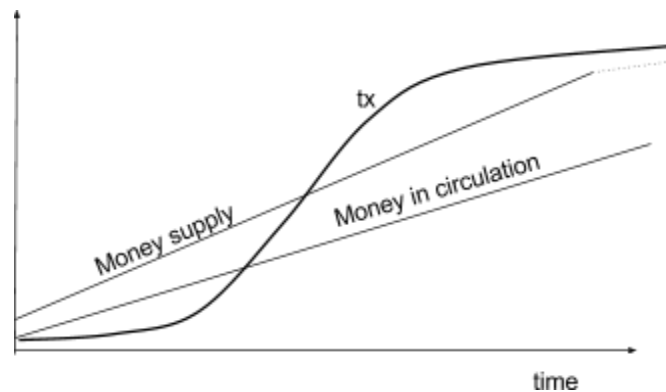
The blockchain itself can issue digital currency based on the growth of the chain, and the “proof of works” from computing and storage. In this way, the issuance of the digital currency from the system itself can sustain the growth of the system and make it valuable with relevant data accumulation and trustable consensus in the network. Eventually everyone, including creators, miners and sharers, can benefit from early issuance of the currency. It's also a great opportunity to p2p sharing community, to convert their spirit into decent interest. There's no need to be tagged “piracy” anymore, because there's no further incentives as eventually all music can be found on blockchain-based system.

Early Apps should be usable,or highly centered by user experiences(UX), to reduce the learning curve to boost the network scale.

Economy

Since the adoption of Musicoin will inexorably follow a Sigmoid curve, no matter how far it may reach, there should be a strategy on money supply accordingly based on this nature.

Will there be a limited supply of Musicoin similar to Bitcoin? We argue this because we are optimistic on the future music consumption. We see Bitcoin didn't get enough applications because of the disconnection between Bitcoin and real world economy. Instead, we should have a easing strategy to money supply once there are more demands to consume more music with relatively stable price. E.g. if we define one coin to consume a song play as a reference, the money supply strategy should strive to keep this as a principle.



In this way, we won't see the ever increase of Musicoin vs. fiat currency like Bitcoin because we don't want the unit music consumption going to unbearable to consumers, thus leaves the currency useless but for speculating. Instead, the deflating-proof method will give creators, miners and all users may benefit from new issuance of coins.

Conclusion

By creating a blockchain-based new music transaction system, it's possible to solve the chronicle diseases of current music industry. The coded contract will ensure every transaction not only be recorded, but also make sure them reflecting the creator's will. The elimination of many unnecessary layers on profit sucking will assure a more healthy industry. The same time, the security mechanism attaching with such an open system can assure privacy of consumers as well, which is the most important measure for future society.