An Exploration of Blockchain Technology

As a Solution for Digital Rights Management

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Abstract

With the advent of streaming and growth of the market for independent artists, labels and publishers, the music industry struggles to keep up with data management for streamlined and accurate rights ownership documentation, payment settlements, and licensing needs that have arisen in an overly saturated global and digital landscape. This leaves the indie community wondering where efforts have been made toward a universally adopted solution for them to build sustainable careers without having to lean on the resources of major labels and publishers.

This thesis explores blockchain technology as a potential solution for career challenges faced primarily by independent artists as it pertains to digital rights management (DRM). Research was a mixed blend of both qualitative and quantitative data. Data collection came in the form of industry expert insight via interviews and more diverse but relevant audience survey results as well as various supportive articles and books written by well-respected authors in the areas of blockchain and music.

A few pilot programs using blockchain technology have shown its capabilities in enabling users to more easily and accurately consolidate, track, manage and exploit their songs' data rather than relying on the dated, sluggish traditional approaches to digital rights management and licensing. However, the research also shows the music industry has a long way to go for wider scale adoption in its current state of standardization, digitization and adaptation to ensure market fit and longevity for blockchain application. Still, the progress being made leaves many artists hopeful that they might someday be able to make a living doing what they love.

Industry Problem

There has been a rise in independent labels, not belonging to or affiliated with major film or record companies, in the past few years. In a 2018 WINTEL report, indie record labels accounted for 39.9% of the global recorded music market in 2017 and have experienced an 11.3% year-on-year growth,

which is more than 10.2% growth for the rest of the music market (i.e. the majors) in that same year (Worldwide Independent Network, 2018).

Some reasons why artists prefer to remain independent are the following:

1) Per an August 2018 Citigroup report, musicians received just 12 percent of the $43 billion in sales generated from their work in the U.S. in 2017 (Sanchez, 2018). Tech companies, radio stations and major labels get the largest share, and some independent artists feel this is not equitable.

2) New digital channels for marketing and fundraising (e.g. Spotify, Instagram, and Kickstarter) have provided means for artists to become more involved and communicate directly with their fans. As a result, there seems to be less reliance and dependencies on third-parties, thus allowing artists to have more control over their careers.

But many independent artists are not currently able, nor believe they will be able in the near future, to make a living solely from music -- a discouraging note. It has been reported that only the top 1% of megastars are making 75% of all industry income (Resnikoff, 2014) — and in 2017, that share of the pie was only 12% of all revenue generated by the music industry (Lynch, 2018).

Pew defines the middle class as those whose annual household income is two-thirds to double the national median. Per the Census Bureau, the 2017 nominal median income per capita was $31,786 and real median household income was $61,372 (Martin, 2018). In 2018, nominal median income per capita rose to $33,706 and real median household income was $78,646 (Amadeo, 2020). The author sought to dive deeper than the broad Bureau of Labor Statistics numbers, which seemed to lump other artist job categories in with musicians (2018). Per Music Industry Research Association in collaboration with MusiCares and Princeton University Survey Research Center, who sampled both professional and amateur musicians, the median musician made around $35,000 in 2017, but only $21,300 of that total comes from music. The 2018 updated MIRA survey for musicians noted "the median musician in the U.S.

earns between $20,000 and $25,000 a year. Sixty-one percent of musicians said that their music-related income is not sufficient to meet their living expenses" (MIRA, 2018; Montgomery, 2018).

Almost 4 out of every 10 dollars spent on music goes to the independent sector. Artist direct revenues are $101M in 2017, up from $94M in 2016 (AWAL, 2017). If musicians are independent and majors aren't taking a significant cut, it raises the question if numbers account for *true* earnings or if there are other variables at work.

An estimated $1.5 billion in unclaimed music royalties was reported in 2017, according to NOI filings (Brady, 2019). After three years, SoundExchange releases unclaimed royalties, which then get scooped up by major labels and top-selling artists (CD Baby, 2019), which means many artists aren't receiving their full income earned from music. Transparency into current industry processes such as filings with performance rights organizations (PROs) have shown inefficiencies and inaccuracies due to manual input and outdated methods that have contributed to the problem.

Some have speculated that blockchain technology is the solution for tracking rights ownership and royalty payout as well as streamlining licensing opportunities for both major and independent artists. However, the proposed strategies for implementation are not without their own complications and the implications impact a large scope of individuals in the music industry, so it warrants careful review.

Research Goal and Questions

The goal of this research is to support independent artists and music industry professionals seeking a scalable, cost-saving, efficient, accurate, and transparent digital rights, royalties, and licensing management solution. By successfully and widely adopting a blockchain technology solution, many could shift alliances when other sources more equitably distribute funds, lower barriers to entry, increase musical variety, and bring about greater artist career longevity and sustainability.

The four core questions the author is looking to answer are the following:

1) What are the challenges with implementing and adopting blockchain technology in the specific use case of digital rights and royalties management?

2) Who are the key players in the space, and how do they feel about its potential impact on them personally and the industry as a whole?

3) For those who are against or believe blockchain will not have substantial positive impact, what other alternative solutions would they suggest?

4) Are there any successful case studies that can be references to build confidence in continued investment?

Big players in the music industry are currently looking into better database solutions (Dredge, 2019; ConsenSys, 2018; Stassen, 2019), so the timing seems right to assess blockchain technology and its alternatives while it's still fairly new to the industry. This way, platform providers and potential users can plan ahead and avoid pitfalls such as those which befell the Global Repertoire Database (GRD) (Milosic, 2015). Therefore, the research project will serve as a reference point and guide for next steps in either moving forward with blockchain technology or evaluating other digital rights and payment management solutions for independent artists.

Literature Review

Key Themes

The literature consistently notes there has been an explosion of interest in the potential impact of blockchain technology in the music industry (Gheorghe et al., 2017; Fabian, 2017; Arcos, 2018; Sitonio & Nucciarelli, 2018). It seems easier to apply to royalty payout for recordings than it is for compositions -- in part due to more use cases and parties involved with the latter. As Rosenblatt notes, "There is no single, authoritative source for mapping recordings to their underlying compositions. This is the source of many problems with rights and royalties in music today" (2017, p. 9). Casey Rae, Director of Music

Licensing at SiriusXM, mimics the sentiment that the problem is less with sound copyright than on the publisher and composition side (personal communication, November 15, 2019).

The literature such as by authors Howard (2017) and Smith (2018) as well as in the piece Blockchain: Potential to Help (Open Access Government, 2018) outlines how developing a networked database for music copyright information would facilitate fast, frictionless royalty payments, offer transparency through the value chain, and provide access to alternative sources of capital. It also addresses concerns industry players have in regard to artists' increased control over pricing and terms of use which would create a "fair trade" music ecosystem and lead to the demise of record labels and performing rights organizations (O'Dair, 2016).

With digital rights management being the more prominently mentioned topic within the literature, the author chose additional resources to support whom this application would be of value to -- providing stats as presented earlier in this paper on the growing independent music community and their struggle to make a living with music as a career. The author's goal with supplementary survey results to follow later in this paper would be to further solidify the tie-in between a growing need and belief from the sample audience that blockchain could be a solution for that problem.

Barriers to Adoption

The literature notes significant barriers to adoption such as issues with cryptocurrencies, funding of non-profit developments, impact of governance and regulation on the integrity of the data as well as a common standard protocol, and the difficulty of meeting critical mass especially without major label backing (O'Dair, 2016). Experts attempt to unravel how the industry might change in the course of trying to adopt this technology, but there's still many questions to be answered (O'Dair & Beaven, 2017; Howard, 2018, 2019; Lee, 2018; Daley, 2019). Not all industry professionals agree on the extent to which each holds up adoption, which makes it hard to pinpoint which challenge to focus on first as well as what specific policies or discussions are being shaped to address each issue mentioned.

In some literature pieces, the authors seek to reproduce the music industry panorama and the effects the new technologies and modalities of consuming digital content can be represented in a complex vector to include economic trends and marketing implications in the music industry. For instance, historically major labels have been somewhat averse to change and their infrastructures may involve a lot of back office updates to even be ready to implement blockchain -- whether they were on board with the idea or not. As supported in Bielas' senior thesis in 2013, "All record labels have been doing for recent years is to fight and resist the changes that have occurred" (p. 59). This helps set the stage for how various major players are impacted and how adaptable they might be to both the problems that have arisen in the digital age for which blockchain technology is meant to fix and for the application of blockchain in and of itself.

Key Players

Across both topics of application and adoption, literature covers key players within the music industry such as organizations like the Open Music Initiative and blockchain platform developers such as RChain and its associated RSong (Woodford, 2018; Edwards, 2019; Ojimadu, 2019; Whitescarver, 2019), Emanate (Emanate, 2019a-b; Case Study: Radically Rethinking, 2019), Ethereum (ConsenSys, 2016; Williams-Grut, 2018; Cherkasov, 2019), Mycelia (Dredge, 2017; Armstrong, 2018; Harle and Burchardi, 2018; Blockchain Music Platform Mycelia, 2019), Verifi Media (formerly dotBlockchain), VEZT, Resonate, and Revelator as well as what roles they play in analysis and testing of blockchain technology with artists (JungleOnion, 2019).

Gaps in the Literature

The "successful" case studies that have been published are minimal. There's some ambiguity about how far along in the development, application and adoption process each player is with respect to their peers and competitors as well as what arguments seem to resonate more with some of the major players who may need to get on board to push adoption.

As mentioned, the literature is primarily focused on use cases involving rights management and how that impacts royalty payments. Though there could be numerous applications of the technology even beyond the area of recorded music, researchers and authors have chosen to focus in on fixing a specific, "major" industry problem rather than cover how the technology might be used to enhance areas that aren't necessarily broken but could expand beyond their current processes, models & scopes in a more innovative mindset. If blockchain is proven to be successful in the area for which the author of this paper is focused, the projection is more discussion and research will be done in other areas where it could be applied.

Also, the literature seems to be lacking in providing a viable plan or timeline to overcome the aforementioned challenges of (or concerns with) adoption backed by knowledge of what successes and failures have been experienced with developing platforms, approaches and models. There's some reference to attempts to create a universal networked database such as the Global Repertoire Database and Virtual Recordings Database (VRDB) project run by SCAPR, an umbrella organization for the world's CMOs representing performers (Scapr, n.d.) -- but there doesn't seem to be a clear tie-in between where pivots are made based on any failed attempts to come up with a solid model that has proven to have market or product fit.

To sum it up, the initial literature covers the who, what and why, but doesn't cover the how and when aspects of evaluating blockchain technology as a potential solution. When researching alternatives to blockchain, the literature seems sparse. Thus, many parties are still only seeing a part of the picture. The goal of the author's research would be to help paint a more complete picture.

Methodology

The Methods

Research was a mixed blend of both qualitative and quantitative data. Data collection came in the form of industry expert insight via interviews and Qualtrics survey results as well as various supportive articles and books written by well-respected authors in the blockchain and music fields.

Although interviewed sources are chosen based on accessibility and known credibility in a given area, surveys were more widely distributed through various individuals' social media and email lists to, hopefully, get a more random data set in an attempt to limit any biases or groupthink that might be present.

The survey was dynamic as not to lead the participant down a path that is either irrelevant or makes them second guess previous responses. Unless given approval first, the survey was anonymous so that more honest input would be provided.

The author sought to widen the audience the survey would be served up to, so that it would not be apparent that it's meant to serve any particular party. With adapting for any outliers of skews in percentage of respondent type, the goal would be to obtain a relatively equal percentage of submissions and input from the following parties:

- Policy makers or lawyers

- Music platform or app blockchain providers

- Indie artists

- Music business professionals

- Brands that work with musicians

- Individuals who work at performance rights organizations (PROs)

Interviews offer the context the survey may lack. The survey was formatted based on presumptions from the researcher's literature review such as digital rights management being a priority for application of blockchain within the music industry and that many artists would feel they were unable

to make a living from music. Being aware that through the interviews, there may arise a discovery of

problems and insights that the researcher was not aware of, the researcher led more semi-structured

interviews that allow for the conversation to adapt if discussions in a new direction should seem valuable

to continue.

Here are the following interviews that took place:

- Benji Rogers was the founder of PledgeMusic, dotBlockchain Media, a former Board of

    Directors Member for the Future of Music Coalition, and a Berklee Online Instructor.

    Due to his varying roles within the music industry, he offers a unique perspective of the

    impact this new technology might have on various key players.

- Casey Rae is the Director of Music Licensing at Sirius XM and current faculty member at

    both Berklee Online and Georgetown University, Advisory Board Member for BWG

    Strategy, Board President for the National Alliance for Media Arts and Culture, and

    former CEO of the Future of Music Coalition. He would be able to offer a unique

    contribution from the policy makers' perspective.

- Steve Stewart is the CEO and Co-Founder of VEZT, Inc., a blockchain solution for the

    music industry. He's also the Owner of Steve Stewart Management, the management

    company for the band Stone Temple Pilots. His perspective as an artist manager and

    blockchain solution provider offers more to the mix of perspectives already gleaned from

    the first two interviews.

- Bruno Guez has been a radio host, and is the President of Quango Music Group, Founder

    of Revelator's Original Works which is a blockchain solution for the music industry, and

    a Board Member of Merlin. He was recommended by the researcher's academic advisor,

    George Howard, as a blockchain solution provider who actually had moved past

developmental phases to execute with success for various music industry parties, so this

offered a way to gather a more concrete case study.

Although the author was unable to obtain additional interviews, the following are recommended

individuals to speak with for readers who wish to gain further insight on the topic beyond this paper:

- Imogen Heap, Founder of Mycelia

- Kenji Claudio, Blockchain Executive at Momentum Studios

- Rico (Federico) Soto, Director and Founder of Fire Entertainment and Director at Australasian

  Blockchain

- Sean Gardner, Founder at Emanate

- David Weba, working at Musicoin and Emanate, a leading provider in blockchain technology

- Fabian Alsultany, Director of Business Development at RChain Cooperative

While the researcher sometimes asked similar questions to gain the unique perspectives on

particular critical points, she also hoped to advance the knowledge gleaned with additional questions. This

way, the research was more extensive and the content delivered in the interviews would not become

redundant.

The Limitations

The limitations of this research lie in assessing the impact to a very specific audience. For

instance, the research provides a limited view on the impact the proposed solution will have for major

labels or for established, signed artists -- primarily because these individuals were not as accessible to the

author as other parties. Additionally, a lot of previous research has been more focused on other industries

such as banking with cryptocurrency. Less cases, in comparison, have been deployed for the music

industry specifically. But with limited cases, the research has more value being current -- and the knowledge pool has expanded since the beginning of research and writing this paper.

The aim of this project was not to definitively claim blockchain is the best option for everyone or that it can be implemented seamlessly without any roadblocks in all use cases. For blockchain technology implementation to be successful for independent artists, many parties in relation have to agree and adopt the solution, none of which can be guaranteed through this research. Thus, the aim of this project was to assess whether blockchain technology could be a potential solution rather than *the* solution.

Additionally, there are many applications of blockchain within the music industry. This specific research focused on an immediate need to handle issues with digital rights management, which ultimately impact proper rights association as well as the speedy and accurate payout of royalties to artists. As such, the researcher is aware that certain parties could feel more impacted either positively (e.g. blockchain providers) or negatively (e.g. PRO employees) as a result of the furthering of blockchain implementation and adoption, thus the sentiment may reflect in the survey answers received. As such, it was important to offer both closed and open ended questions to detect that sentiment and context around particular survey responses.

Further research will need to be carried out to avoid overgeneralizing and subjective findings by weighing positive and negative implications for multiple parties based on several normative ethical theories to offer a comparison for the scope of impact across the board. Additionally, research will have to be carried out on the various strategies and options for deployment in various stages of an artist's career and for various genres to weigh which would be the best approach for universal (or near universal) adoption of blockchain technology across the music industry as a whole.

Results & Discussion

Through the author's original research, she was able to both confirm many points within the initial literature review as well as provide supplementary information on what was lacking in the area of adoption challenges and alternative solutions.

Survey Participants

The confidential Qualtrics survey has 104 respondents from whom the following results were pulled (67 from a first survey and 37 from a second survey with slight variations). The first few questions in the survey helped gauge who the participants were, their knowledge of blockchain technology and its perceived impact on their lives and/or careers along with any positive or negative sentiments.

Table 1

Survey 1 Takers Current Role or Position

I am a student in some field of music, music technology and/or music business.	9.68%
I am a company or brand considering working with those in the music industry.	3.23%
I have a company or brand that works with individuals in the music business, and am a signed major label musician/artist.	0%
I have a company or brand that works with individuals in the music business, and am a signed indie label musician/artist.	0%
I have a company or brand that works with individuals in the music business, and am an unsigned indie musician/artist.	9.68%
I have a company or brand that works with individuals in the music business, but not a(n) musician/artist.	11.29%
I am a music business professional and a signed major label musician/artist.	3.23%
I am a music business professional and a signed indie label musician/artist.	0%
I am a music business professional and a(n) unsigned indie label musician/artist.	20.97%
I am a music business professional, but not a(n) musician/artist.	33.87%
I am a music lover, but not a(n) musician/artist or music business professional.	3.23%
I am a signed major label musician/artist.	0%
I am a signed indie label musician/artist.	0%
I am an unsigned indie musician/artist.	4.84%

Table 2

Survey 2 Takers Current Role or Position

|	
I am an unsigned indie musician/artist.	10%
I am a signed indie musician/artist.	2%
I am a signed major label musician/artist	4%
I am a music lover.	8%
I am a music business professional (other than a musician/artist).	32%
I have a company or brand that works with musicians or professionals in the music business	24%
I have a company or brand considering working with those in the music industry.	6%
I am a student in some field of music, music technology, or music business.	14%

In the first survey, out of the 62 responses, 33.87% noted their current position or role was as a music business professional but not a musician/artist; 20.97% noted their current position or role was both as a music business professional and unsigned musician/artist; and 11.29% noted they have a company or brand that works with individuals in the music business other than musicians/artists (Table 1).

In the second survey, the author made two of the options conditional to show only relevant breakdowns or additional options for roles when necessary. She also made the survey multiple choice so that there weren't so many answers to read, but one could combine how he or she saw their role or position to be. In this case, there were 50 responses with 32% noting they were a music business professional (other than a musician/artist), and 24% of those noting they have a company or brand that works with musicians or professionals in the music industry (Table 2).

It's important to note that with these results, some bias might lie in balancing support for artists vs making money for one's business -- being that most respondents noted they had a business. The weight of that bias would largely depend on the type of business one is running. But the results primarily lean toward those who have more than just a casual interest in music and could lead to more critical thought before answering certain questions throughout the survey.

Figure 1

Survey Takers Length of Time Aware of Blockchain Technology
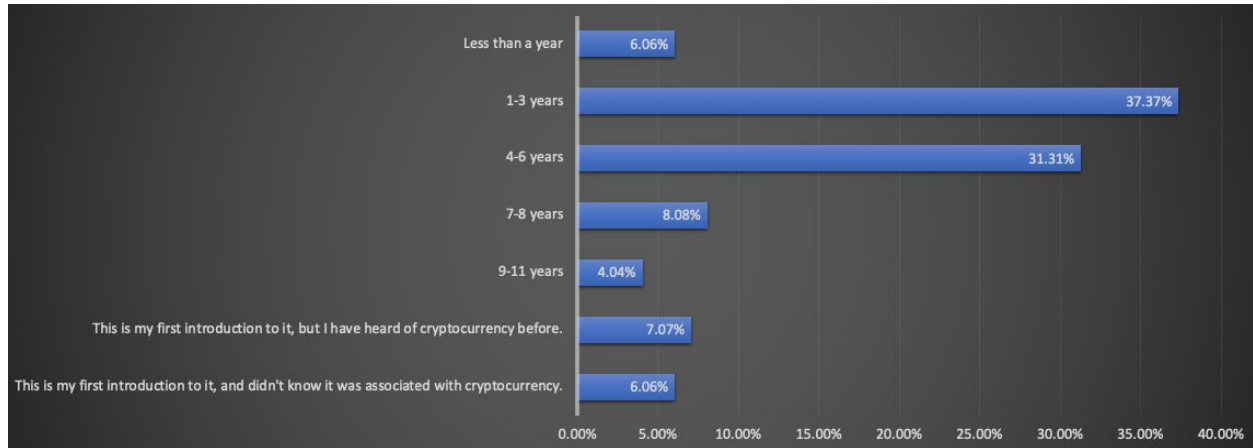
Out of the 99 responses (a total across both surveys), 37.37% noted they've known about

blockchain for 1-3 years and 31.31% noted they've known for 4-6 years (Figure 1). It's important to note

that years of awareness do not equate to years of knowledge, or the extent or variation of such knowledge.

At this point in the survey, the author would not be able to tell whether having less or more awareness

adds to any bias an individual might have in responses.

Table 3

Survey Takers Current Level of Experience with Blockchain Technology

I currently apply it for business other than as a(n) musician/artist.	9.68%
I've applied it in the past for business other than as a(n) musician/artist, but no longer do so.	1.61%
I currently apply it as an indie musician/artist.	1.61%
I currently apply it as a signed major label musician/artist.	0%
I've applied it as an indie musician/artist, but no longer do so.	1.61%
I've applied it as a signed major label musician/artist, but no longer do so.	0%
I currently apply it as an indie musician/artist and for other business.	8.06%

I currently apply it as a major label musician/artist and for other business.	0%
I've applied it as an indie musician/artist and for other business, but no longer do so.	0%
I've applied it as a major label musician/artist and for other business, but no longer do so.	3.23%
I have an interest in it and/or have studied up on the topic for business application other than a musician/artist.	20.97%
I have an interest in it and/or have studied up on the topic for application as an indie musician/artist.	9.68%
I have an interest in it and/or have studied up on the topic for application as a signed major label musician/artist.	0%
I have an interest in it and/or have studied up on the topic for application as an indie musician/artist and for other business.	3.23%
I have an interest in it and/or have studied up on the topic for application as a signed major label musician/artist and for other business.	1.61%
I am just beginning to hear of it and explore it more as an indie musician/artist.	4.84%
I am just beginning to hear of it and explore it more as a signed major label musician/artist.	0%
I am just beginning to hear of it and explore it more for business application other than as a musician/artist.	8.06%
I am just beginning to hear of it and explore it more as both an indie musician/artist and for other business.	3.23%
I am just beginning to hear of it and explore it more as both a signed major label musician/artist and for other business.	0%
I am not sure if I have an interest in it, but it sounded interesting enough.	22.58%

As noted in Table 3, when asked about current application or interests in blockchain, out of the 62 responses to the question, on the first survey:

- 22.58% noted they were unsure if they had an interest, but thought it sounded interesting enough to take the survey;

- 20.97% noted they had an interest in, studied up on previously, or were just now hearing of it -- but were looking at its application for business or other areas outside of being a musician.

There were barely any results from the second survey that dynamically separated out application or interest questions based on those relevant for the role selected previously. For instance, if someone had said they were not a musician, it would not make sense to ask a question about how they apply blockchain as a musician. The survey results overall skew more toward the interests of professionals or those who are

unsure if they even have an interest in blockchain. Again, without knowing specifically what those

professions are, the author had to be cognizant of certain biases that might exist moving forward.

Industry & Personal Impact

Figure 2

Survey Takers Thoughts on If Blockchain Will Benefit the Music Industry
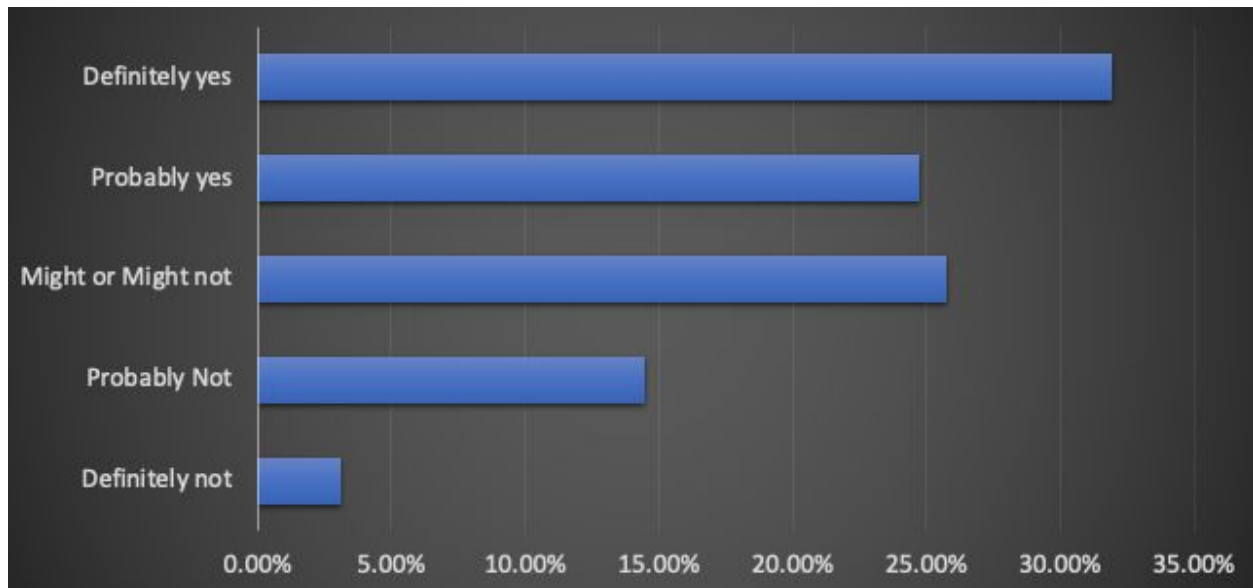
When respondents were asked if they thought blockchain technology would benefit the music

industry, out of the 97 responses across both surveys, 56.70% noted "probably yes" or "definitely yes"

while 25.77% were indifferent (Figure 2). Later in this paper, the author will cover the rationale behind

these responses according to further feedback provided by those taking the survey.

Figure 3

Survey Takers Thoughts on Impact Blockchain Will Have on Their Job/Career
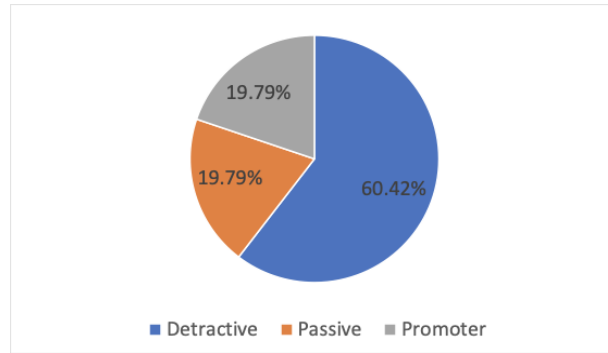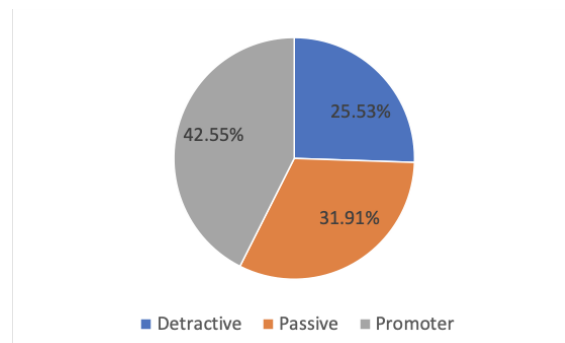
Figure 4

Survey Takers Thoughts on What Type of Impact Blockchain Will Have on Their Job/Career

On a scale of 0-10 (with 0 being least impactful), the respondents were asked to rate how much they thought blockchain technology application and adoption in the music industry would impact their job or career. Out of 96 responses, 60.42% thought it would have little to no impact, 19.79% thought it would have some impact, and 19.79% thought it would have high or critical impact (Figure 3). At this point, the author was curious as to why individuals thought it would have little to no impact. It's also important to note that since most individuals did not feel it would impact them greatly, their responses may not be representative of those who it does impact more so and perhaps should have more stake in decisions.

For those who thought it would have an impact, they were asked to rate on a scale of 0-10 whether that impact was negative or positive (with 0 leaning negative). 25.53% thought it would have a negative impact, 31.91% were teetering in the middle, and 42.55% thought it would have a positive

impact (Figure 4). Even though many thought it would not have an impact on them personally, for those who did, many teetered between whether it would be positive or negative. This substantiated the author's research in dispelling whether it truly would or wouldn't. It was interesting how the survey results leaned more negatively than what the initial literature review had provided -- perhaps in part that the individuals primarily writing about the benefits of blockchain would more than likely be individuals who are part of an audience that would benefit from it whereas the survey could have been more diverse in respondents.

Aside from personal impact, the majority felt it would have a positive impact on the music industry as a whole -- which justified the author looking deeper into blockchain technology as a solution for a(n) industry problem(s).

Problems To Address

The author's literature review pointed to the benefit of getting paid faster and more accurately with blockchain -- so the author set out to see if participants felt this was an issue that needed to be addressed.

Table 4

Survey 1 Takers Thoughts on How Much They Earn from Music

I earn enough to make a living from being a(n) musician/artist alone. I do not have any other job.	5.88%
I earn enough to make a living and then some from being a(n) musician/artist alone. I do not have any other job.	3.92%
I am a music lover and/or brand, but not a(n) musician/artist, so I earn from (an)other non-music industry related job(s).	17.65%
I don't earn as a(n) musician/artist. My primary income is as a music business professional. I would prefer to make a living as just a(n) musician/artist.	1.96%
I earn as a(n) musician/artist alone, but not enough to make a living. I supplement income as a music business professional, but I would prefer to make a living as just a(n) musician/artist.	0%
I earn as a(n) musician/artist alone, but not enough to make a living. I supplement income as a music business professional. Even if I made enough to make a living as a(n) musician/artist, I would still keep my music business professional job.	1.96%
I don't earn as a(n) musician/artist. My primary income is as a music business professional. Even if I made enough to make a living as a(n) musician/artist, I would still keep my music business professional job.	29.41%
I earn as a(n) musician/artist alone enough to make a living, but I also supplement income as a music business professional	3.92%

I earn as a(n) music/artist alone enough to make a living and then some, but I also supplement income as a music business professional.	15.69%
I do not earn as a(n) musician/artist. My primary income is from job(s) I am less passionate about.	9.80%
I earn as a(n) musician/artist, but not enough to make a living. I supplement my income with job(s) I am less passionate about.	3.92%
I earn enough to make a living from being a(n) musician/artist alone, but I also have income from (an)other non-music industry related job(s).	1.96%
I earn enough to make a living and then some from being a(n) musician/artist alone, but I also have income from (an)other non-music industry related job(s).	3.92%

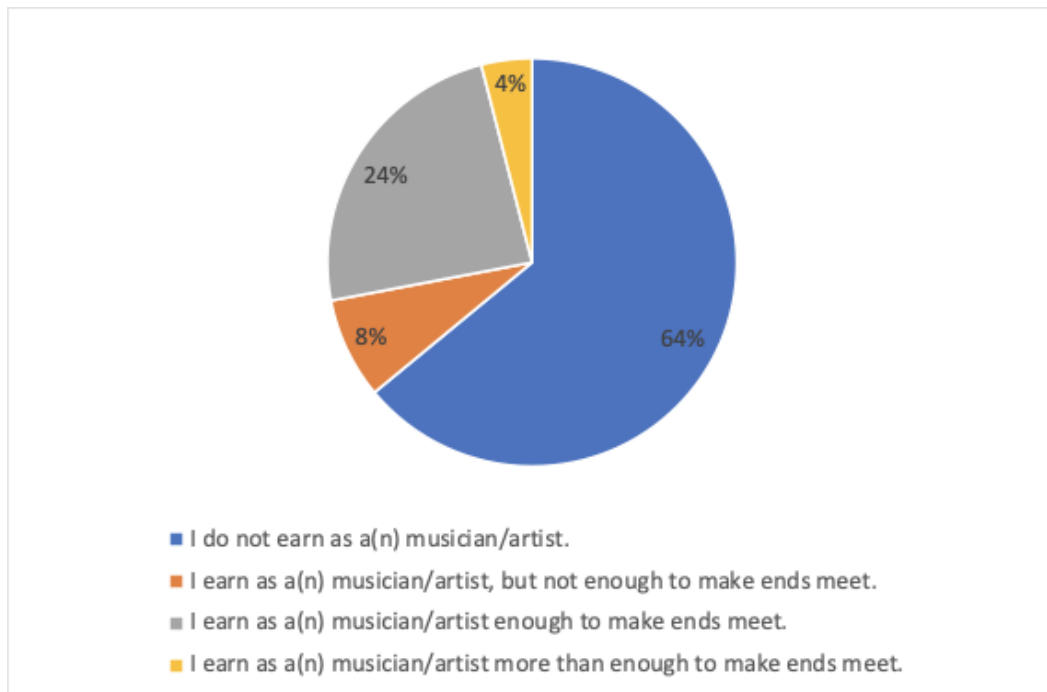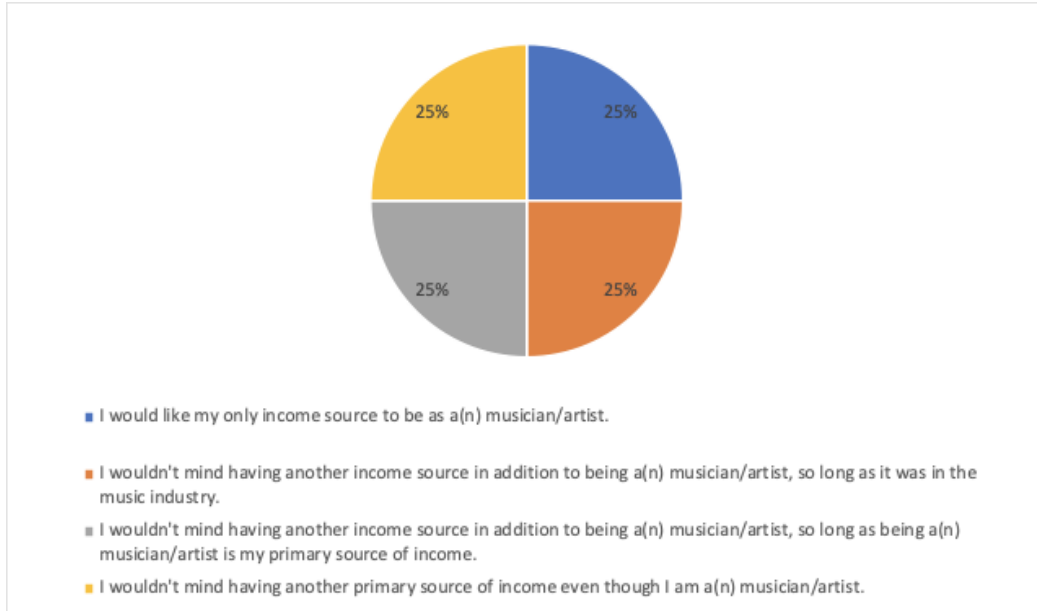**Figure 5**

Survey 2 Takers Thoughts on How Much They Earn from Music

Figure 6

Survey 2 Takers Thoughts on Whether They Want To Earn from Just Music

- I would like my only income source to be as a(n) musician/artist.

- I wouldn't mind having another income source in addition to being a(n) musician/artist, so long as it was in the music industry.

- I wouldn't mind having another income source in addition to being a(n) musician/artist, so long as being a(n) musician/artist is my primary source of income.

- I wouldn't mind having another primary source of income even though I am a(n) musician/artist.

She wanted to confirm earlier stats to see if artists were earning from their music and if they'd like to earn more. The first survey was too long in that it covered both answers for artists and non-artists. In the second survey, the author dynamically adapted it -- so the question about artist earnings was only asked to those who previously answered their role was that of a musician and/or artist.

In the first survey, out of 51 respondents, 29.41% noted that they don't earn as an artist, their primary job was as a music business professional. In addition, even if they earned as an artist, he or she would still keep their primary job. Following was 17.65% of respondents noted they are either a music lover or brand, but not an artist and earn from a position outside of the music industry (Table 4).

In the second survey, 64% do not earn as a(n) musician and/or artist, followed by 24% that make enough just to make ends meet (Figure 5). It was even in response as to whether or not they would like music to be their only source of income or not (Figure 6). But it does not diminish the fact that one does not earn (or earn enough) in music just because he or she wouldn't mind earning more money period.

Because most survey respondents were professionals, it was important to pinpoint the thoughts of those who earned as musicians, specifically, for which implementation and adoption of blockchain would probably impact positively the most in the particular focused pain point.

When asked if they felt they got paid royalties in a timely manner of those who noted they were independent artists, out of the 26 question respondents, here were the results:

Figure 7

*Survey Takers Thoughts on If They Felt They Earned Royalties in a Timely Manner*
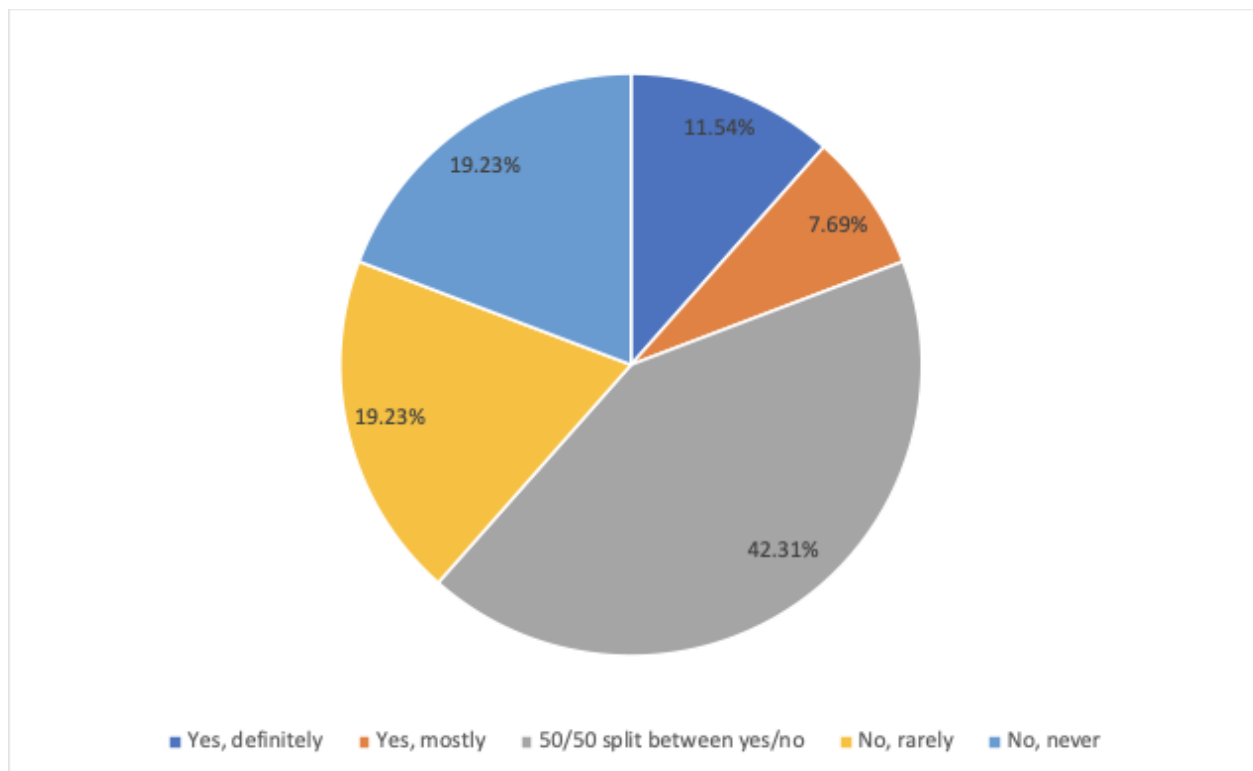
Many respondents were a bit iffy on whether they felt payments came in timely or not, but only 19.23% felt they got paid in a timely manner most or all of the time. The results still leaned toward rarely or never getting paid in a timely manner as the 38.46% of responses show (Figure 7).

They were then asked to assess accuracy of payment based on rights and ownership. Out of the 26 responses, here were the results:

Figure 8

Survey Takers Thoughts on If They Felt They Got All Royalty Payments Due
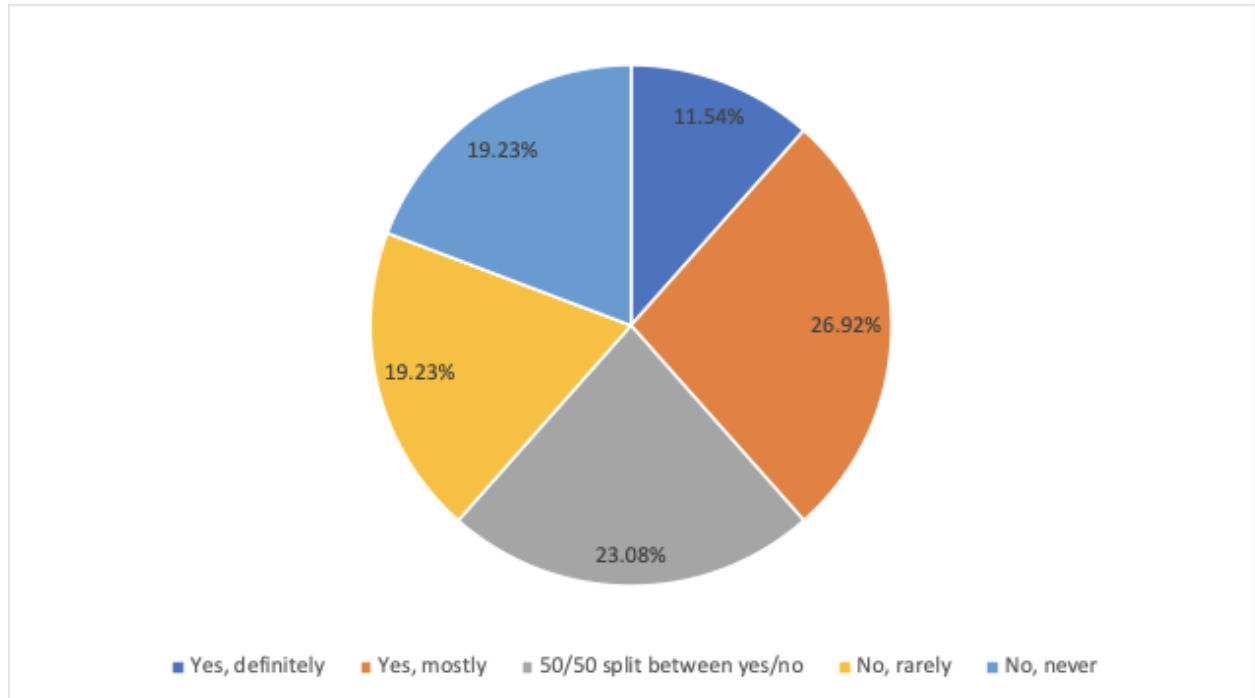
There's a more apparent problem with the timeliness than accuracy of payments as can be seen by comparing the pie chart above (Figure 8) with the previous one (Figure 7). It was more balanced for getting paid what was due than it was for timeliness of the payment. Still, the numbers seemed unsatisfying. In the author's interview with Steve Stewart, an artist manager, he confirms that both production and distribution seem more efficient these days, but the area of concern by many is monetization (personal communication, October 28, 2019).
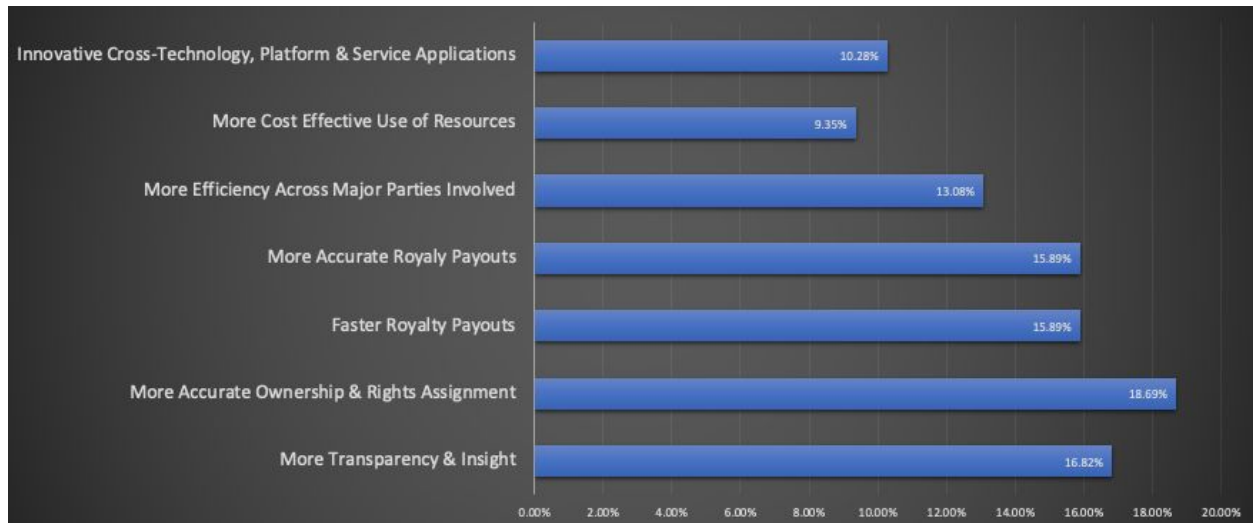
Blockchain Benefits

The next part of the survey helped pinpoint where the benefit(s) of blockchain, specifically, lie(s). For those that thought it would or has already benefited the music industry, they were asked to select from

a list of potential benefits they thought might be associated. Some chose more than one option due to the

increase in respondents (i.e. 172 answers for the question with 104 people who had taken the survey).

Figure 9

Survey Takers Thoughts on How Will Blockchain Technology Potentially Benefit the Industry

Based on the results, where blockchain has or would lead to the most benefit seemed to be in

transparency, more accurate ownership or rights assignment leading to more accurate and faster royalty

payments. This justifies the research focus into digital rights management, specifically, which is where

most of the author's literature review pointed anyways (Figure 9).

Steve Stewart, also a blockchain platform provider, believes by building a blockchain

marketplace to put up fractions of intellectual property for the public, the idea of exploitation through

licensing is made easier. His company, VEZT, provides a public ledger that reports transaction hashtag,

date, time, and location for accounting purposes, making it easier to track (personal communication,

October 28, 2019).

Blockchain Adoption Challenges

It's important to note why some individuals felt it would not benefit the music industry and see if the challenges or disbelief in blockchain could be overcome by counter arguments presented during the author's semi-structured interviews to make sure her own bias was being limited.

It Goes Against Big Player Interests

Many survey respondents thought if anything is going to be widely accepted then major labels and publishers will have to be on board with the idea. But if the majors are profiteering from the "black box" of unclaimed royalties they get to dip into, why would they have a reason to change? One survey respondent writes "people who make a living on artists' works do not let artists handle royalties payout processes (otherwise, they will lose their job)."

In the author's interview with Steve Stewart of VEZT, he confirms there's a "$10 billion float with PROs and CMOs." After approximately 18 months going unclaimed, it gets distributed in a way that currently serves those with larger market share or clout. PROs have tiered payments, so a top tier artist gets a "bonus" or incentive (personal communication, October 28, 2019).

Additionally, if there's any discrepancy, whether it's the artists fault of not, the PROs don't have to pay. And one can't audit them per their terms. Steve compares the process to lawn tickets being sold at an amphitheater. He says, "No one truly knows how many 'seats' are really out there, which means someone could be taking a skim off the top." In his opinion, the question has always been about who's holding the money and how long they're holding on to it where it benefits them the most (personal communication, October 28, 2019).

Historically, majors have been averse or unprepared for changes such as when Napster and piracy were running rampid, and the acceptance of the MP3 was long overdue. Another survey taker notes, "blockchain technology is at a similar point as the Internet was in 1994. In those days, most people in the record/music industry thought: 'Internet? What do I need that for?' It took many years for bandwidth to increase and applications for music distribution to be built and distributed."

Steve Stewart points out in the interview with the author that ASCAP and other majors are considering blockchain, so the idea is not as new to them as one might think. But there are larger issues at stake like the fact several CMOs, PROs or other rights organizations across the globe have their own databases, and attempts to universalize have been problematic because the question comes down to: who owns the data? Everyone wants to be the owner of the data (personal communication, October 28, 2019).

With a public blockchain solution developed by an objective third-party, this enables data to essentially be owned by everyone. As Steve Stewart mentions, "an artist, publisher or labels may not know who attends live shows, but Ticketmaster does. An artist can't properly market to that audience. Similarly, he or she can't market to an audience base on Spotify, because he or she does not have access to the full scope of data Spotify has. Thus, power is shifting to the data keepers" (personal communication, October 28, 2019).

How does blockchain technology application come into play? Benji Rogers (formerly of dotBlockChain, explains to the author: Labels are more reliant on data and licensing, but they don't have digital control over their own assets. It goes to a third party. If you are Warner and license for a movie, you have to pay to figure out the songwriters. Furthermore, there are costs associated with a Sony lawyer perhaps taking six months to clear a song, because there's no ledger between the lawyer and the publisher. So while you may earn a lot from the black box, you probably lose more than you would gain at the end of the day from being more transparent (personal communication, October 31, 2019).

While that seems like an easy solution, transparency is a scary idea for those who have made a buck on the lack of it. Unfortunately, artists are locked into contracts where they're potentially not allowed to share their earnings reports. If they were more transparent, it could lead to the majors being seen as less desirable. The artist that one thought was making millions is waiting two years for a paycheck. Then, as Steve Stewart mentions, "PROs with large overhead and admin costs may seem like a

nonprofit, but definitely don't function like charities -- so there's a cost not going directly to the artists

when passed through a PRO" (personal communication, October 28, 2019).

Having some ability to see patterns in the development of new technology in the music industry,

major labels and rights management companies would need to embrace blockchain technology and help

to build the data infrastructure to make it work. One survey respondent believes this will take 7-10 years,

similar to how long it took the World Wide Web to be embraced by the industry. Steve believes that if big

players want to be part of the ecosystem, they're going to almost be forced into accepting transparency

(personal communication, October 28, 2019). As Bruno Guez puts it in his interview with the author, to

limit fractionalization, "walled companies will be compiled, and we're going to be moving toward a more

open Internet" (personal communication, November, 12, 2019). Steve adds, "we already see movie box

office earnings publicly, so why should music be different" (personal communication, October 28, 2019)?

In and interview with Benji Rogers, founder of PledgeMusic who was heavily involved in the

early stages of Verifi Media (formerly dotBlockchain), he notes that the independent players are more

numerous than major players, so there's a Network Effect that creates a form of trustworthiness in a

blockchain solution from adoption in general. Eventually, the majors would see a competitive advantage

for jumping on board the bandwagon. Think of it like if someone uploads and tags an image of an

individual on Facebook. It exists, image recognition algorithms pick it up, and ads are served up to friends

of the tagged person, whether one has an account or not. One doesn't want to be the smuck at Sony who

gets notifications a user is changing a record of splits on a song in the Sony catalog and then not jump on

the platform to confirm or deny it. With so many songs uploaded a day, this could be a catastrophe

(personal communication, October 31, 2019).

In regard to job displacement, although some may be negatively impacted, the jobs would simply

shift rather than be eliminated. Someone will still have to make sure the standards for input initially are

met either way. As tech develops and jobs become obsolete, new job opportunities become available -- so

it just comes down to proper training as individuals make that transition. However, knowing there will be

some impact on an area for which some individuals are more heavily involved is enough for them to push

against adoption.

Lack of a Proof of Concept and Better Alternatives

Some say a regular database could just as easily handle the main DRM issues. One survey taker

goes on to say, "there's very little difference between blockchain concepts and the old school DRM server

concepts used by Adobe, iTunes, and Microsoft DRM SDK". Another survey respondent claims

blockchain is "at a level of lead acid batteries to electronics in 1919. To be useful, it needs to evolve to

late 20th century processor level. That's happening at an accelerated rate, but not there yet. Let other

fields grow the tech and then the music industry can build on that." One issue with the latter is that what

works for other industries may not for the music industry, so some degree of prototyping and testing

would presumably still have to take place.

It's important to note that although limited, the author was able to come across a "successful"

case study of utilizing blockchain within the music industry. In a Summer 2019 pilot, Bruno Guez,

founder of Revelator and Original Works, queried BMAT for radio plays of three works on Finnish radio

channels several times a day. Teosto provided the metadata, splits and user information for 19 rights

holders. When a new play was reported, Teosto used the Original Works Network to transfer the royalty

payments and the smart contracts immediately distributed the payments into the digital wallers of those

holders in the form of tokens that could be converted to fiat currencies of their choice (Faster Payments

for Music Rights Holders, 2019; Bruno Guez, personal communication, November, 12, 2019).

Even with a beacon of hope, this third survey respondent notes, "wide adoption of a new software

can take 2-3 years even once decided, and most major companies are still in a phase of testing the waters

with new technologies. Also, there is not yet a solution that has completely solved all the complex

technicalities of storing large amounts of data on a cross-vertical ledger, although some are getting much

closer."

A fourth survey respondent writes, "the entire industry is already fragmented. It's very difficult to

get widespread adoption of any kind of standards, especially data standards, and new technology that

requires a highly specialized set of developers to build it and implement it properly." Another survey

respondent writes, "The blockchain community needs to settle on one platform and currency for

blockchain. The split between the Bitcoin blockchain and Ethereum is very reminiscent of VHS and Beta

(in the home video business in the 80s)."

Majors are still digitizing old catalogs and PROs are still handling many tasks manually in paper

form, so they are nowhere near ready to implement. So the question becomes is blockchain a bad idea

period or just a bad idea now?

Privacy and Security Concerns with New Tech

A record on a blockchain is visible to all, even if individual elements of a transaction are

encrypted and not publicly visible. For instance, a passport may be used as a proof of validation without

revealing the underlying private data. But where this could be a larger problem is that certain financial

institutions are required by law to permanently remove data when required by a court via "right to be

forgotten" laws. Blockchain technology doesn't allow data to be deleted, just updated in subsequent

blocks (Gilmore, 2017). Whether blockchain technology platforms are exempt would need to be outlined

in policy.

Another argument was who would want to make their data and ledgers public to their

competitors? To counter, one could set permissions on what data is visible to whom even if all on the

same public database. But a counter to the counter argument is that it's not so much security once in the

platform that's a concern so much as security through the various touch points synced and connected into

a platform built on the technology. An anonymous survey taker writes, "the concept of 'decentralized' is a

bit of a deception since each blockchain offering clearly has an owner company with certain controls."

Another survey taker goes on to write, "if one sets permissions, that's fundamentally

anti-copyright by creating barriers to wide dissemination and public access. The constitutional purpose of

copyright is not to give copyright holders any control over their works beyond what's necessary to

advance the progress of science and art. Baked into the Copyright Act are principles such as freedom to

alienate lawfully made copies of works. There's too great a risk that blockchain tech would be marshaled

to secure greater control by limiting lawful access."

Poor Market Fit and High Costs of a Cumbersome Roll Out

Some say the benefits of truly open blockchain distributed databases in a fairly centralized

industry are unclear. Even though the indie community is growing in supply, as Steve Stewart noted in his

interview, signed artists have previously earned more and had more fans than many indies combined -- so

a major would probably need to be shown how it impacts revenue of signed big name artists as well

(personal communication, October 28, 2019).

The inherent chain of rights within the music industry will be difficult to replace. The music

industry cares about selling music. If blockchains can't sell more music, they aren't worth it, even if they

reduce expenses. The expense reduction hasn't yet been able to justify the expense of implementation.

There also is no major corporate mentality in any of the existing major manufacturing chains,

which would support this trend. A survey taker writes, "I believe that it is inevitable that the

government(s) will ultimately regulate these channels of commerce, and we see current legislation already

indicating that. The current system, in my opinion, is much less vulnerable to government intervention

than any other form of payment."

There are reliability issues because it's resource intensive and cumbersome. And those drawing

up contracts would still need manual input of the metadata or programming of the contracts. There are too

many players and use cases that it will take a long time to cover. And some cases require context that only a human can properly navigate through, so only simple use cases can be automated.

A counter argument is that any investment will cost, but it's costing more artists properly earned royalty monies the longer we put off the investment. No technology will ever be perfect -- but if those in the industry don't start now, the mass music population will fall further behind. Even if some tasks remain manual, any automation where it makes sense will improve efficiency overall.

A counter to the counter argument is that sales is driven by marketing, so focusing on metadata doesn't necessarily drive more earnings. One survey taker brings up a story from Spotify attempting to focus more on metadata as a litmus to a parallel system that would provide insight into how blockchain might react. While Spotify saw positive cash flow, it's projected to lose up to four times their earnings from the effort. Who will want to invest first?

Lack of Education and Technical Know-How

There is a technical obstacle to embed the blockchain information into actual sound recordings. A lot of artists aren't educated on the benefits of the tech and how to utilize it, so adoption is going to be slow in that respect.

One survey taker suggests, make "it useful for the garage band recording its first album. Anything that is not scalable to the unsigned artist tends to strengthen major corporations that control vast amounts of copyrighted works at the expense of those outside of their fold."

Policy and Legal Adjustments Yet to Be Made

A lot of policy and legal debates remain unresolved, such as the following:

Accurate Illegal Prevention.

Despite the encryption capabilities of blockchain, it might be hard to reduce piracy ude to the fact pinning liability of infringement would be tricky once there's a decentralized network for which a pirate version can be uploaded. The smart contract may not be set up with an algorithm "smart" enough to detect

copyright infringement. Smart contracts may not be programmed well enough to understand the context of illegal activity. It relates to a similar concern YouTube users have when they receive takedown notices for music that falls under fair use. On YouTube, users often upload and vari-speed tracks to escape its Content ID process. Digital audio workstations could work as next PROs, but this could create a formality that Berne forbids in exercising exclusive rights under copyright (De Leon and Gupta, 2017).

Some suggest a contract could be split up, with more vague terms still being outlined in the traditional sense and only the less vague parts programmed as a smart contract, so that contextually based issues will still be handled by real people (Gilmore, 2017). But having a reference outside the smart contract brings an inefficiency in review that undermines part of the reason blockchain is so desirable to the industry -- so some might believe it's more of a hassle to adapt for than the value it can provide.

Because blockchain actions are automated, bonus funds could be anonymously dispersed into various accounts. In 2013, regulatory bodies responsible for preventing financial crimes introduced new regulations to bring bitcoin within the scope of its enforcement, but what about other tokens/currencies? Lawmakers in West Virginia deemed it a felony to use bitcoin or other cryptocurrencies for money laundering with an update to the state's anti-money laundering statutes, creating a definition for cryptocurrency as a monetary instrument — but this is not a widespread protection (Gilmore, 2017).

Liability and Authority.

This leads into a discussion if an illegal act is committed, who is held liable and who has the authority to pursue? Liability goes even deeper to the core of many discussions that policy makers currently have around AI and machine learning (Gluyas and Day, 2018). Since the smart contracts are meant to be self-executing, how to weigh fault and under what circumstances will need to be considered with some basic guidelines before being rolled out to the masses. For instance, if not executed well, who is to blame? Does the fault lie with the platform provider, the developer of the formula, the parties utilizing the technology?

The difference between AI and smart contracts is AI could be fully autonomous while with smart contracts, someone is still responsible for the initial programming. However, it's not too far-fetched to assume, at some point we may want smart contracts to re-program based on what they learn in different contexts that would save a programmer time from setting up all the various rules imaginable.

If the blockchain is where the record information lives, but several individuals involved with the music are in different jurisdictions, certain smart contract rules may deny certain provisions subject to its own laws of jurisdiction. It then becomes a question of which jurisdiction has the authority to interpret and enforce the contract or prosecute its violation. Because the authority figure might shift depending on several minute details, making it overly complex, one could not declare a single authority in the rule (De Leon and Gupta, 2017).

The jurisdiction concern extends to what kind of tokens, bitcoins or other currencies might be used on these platforms. If bitcoin is a commodity, then the Commodity Futures Trading Commission (CFTC) in the U.S. has jurisdiction over local bitcoin exchanges. And one has to consider whether certain transactions can be taxed. There's a unanimously backed proposal from senators in Nevada that would block local authorities from instituting taxes or fees on blockchain use — but a more widespread standard would want to be set (Gilmore, 2017).

Fair Compensation Calculations.

Even when one has smart contracts in place, which could be seen as several direct deals, if this is taking place on a large scale, there's only so much pie or split to go around. Which just like we have seen with streaming platforms and the Music Modernization Act, we no doubt will see legislation drafted for what rates are fair on the blockchain to make sure all parties, especially authors, are compensated fairly.

Although there's little doubt that smart contracts would improve fairness of artist compensation overall, it does not eliminate artists from being persuaded into bad deals. Thus, in the early phases of smart contracts, greater oversight to ensure adequate protections to parties with weaker negotiating power

should be considered. Existing guidelines such as royalties fixed by consent decrees would need to be re-evaluated (De Leon and Gupta, 2017).

The problem lies not within the technology itself in this case, but those who would abuse it. There need to be certain antitrust protections considered.

Antitrust Protections.

Looking ahead to how consolidated not only labels and PROs have been but also how consolidated the top players in music streaming are — and how many are becoming more vertically and horizontally expanding (e.g. Apple and Amazon) — the same concerns can be said for blockchain platforms. Right now, there are only a few players in the music space. There are discussions of the need to come together to set a standard, because it's harder to get adoption when each platform has its own tokens. Some thought to antitrust issues for blockchain monopolies needs to be addressed to keep them in check (De Leon and Gupta, 2017). And we're back to the age old question: how much regulation and control is too much?

One might think that with labels wanting to keep their "black box", blockchain providers will never get too big as they need major content for the end user who is spending the money to buy in. If you follow the money up the supply chain from end user to distributor all the way back up to author, demand will determine supply.

But the major players may be forced to refute or accept claims made at various points on a platform when they're pulled in by mere mention. Just like with iTunes when labels took drastic reduction in prices (upward of one-third), entrenched entities may take a less ideal position in the supply chain as more demand for the technology makes what they offer obsolete.

And they have become wise based on the experience with the digital transition. Major players in the music industry are either acquiring or partnering up with blockchain providers. For instance, Spotify purchased MediaChain, a blockchain start-up, and PROs like ASCAP and SACEM partnered with IBM to

explore blockchain. PROs are so "hamstrung by consent decrees that artificial intelligence – enabled

pricing would have to be approved by the Department of Justice, because it may be seen as involving

collusion"(De Leon and Gupta, 2017, p. 28). But the progressive use of blockchain in the music industry

may push those decrees to be modernized (De Leon and Gupta, 2017).

The industry overall seemed to be at a stalemate on what was better: 1) to wait to clean up and

universalize before bringing blockchain into the picture or 2) blockchain can be tested in tandem as clean

up and universalization will only delay the benefit from being realized.

Path To Adoption

Being aware of the individual challenges and concerns, whether or not one thinks blockchain will

provide a large scale benefit or not to be worth undertaking, the author sought to have more objective

takes and see what the thought would be if the industry were to continue on the route of trying to adopt

the technology. So, how do we get to get moving in the right direction?

Minimum Viable Standards and Processes

One survey taker mentions "evolution and process structure design" needs to be re-thought, to not

try to stick to how we have done it but envision how we should do it. "Devise a comprehensive and easy

chain of rights with a simpler money flow structure." Below are three areas to consider:

Data Clean-Up and Standardization. There's two parts to the discussion of data: 1) cleanup of

current records and 2) standards for moving forward to keep clean records. It seems like the data mess

perpetuates when recordings go out before they are properly matched with composition data. In the

author's interview with Casey Rae, Director of Music Licensing at SiriusXM, he says, "Two decades of

mergers and acquisitions have left a lot of mess with data and labels. Here's where we stand: CI data

providers and data standards like DDex do exist. SiriusXM hand codes the data. It wasn't so much effort

on the service side, because people thought of the problems as being SoundExchange's program and not

their own. ISRC has had more movement toward using a standard. GRID has a broader range of data

relative to the unit. At the end of the day, commitment to minimum viable data standards for all iterations

of end user and licensing activity need to be cemented and accessible to folks who legally want to obtain

it in various contexts. The smart contracts are just a nice to have" (personal communication, November

15, 2019).

Regarding clean-up, one suggestion is to use artificial intelligence and machine learning (Brady,

2019) such as with Exactuals algorithm Rey at royalties.ai, so one can match songwriters with publishing.

If all parties come to an agreement, the question becomes how to deploy a solution like this at scale. But

clean-up will take awhile to complete and shouldn't hold up progress in standardization.

When we talk about standardization, it's not just what goes into a file, but when it's added to a

chain and how it's adapted once it's there. Verifi Media's approach is to insert the blockchain key and any

ownership information into the actual media file at point of creation in a DAW. Then a child file is a

replica of the original -- so when changes are made, it happens to all copies almost instantly. A change log

is kept for reference. If you consider the current process, SoundExchange might email saying a song

belongs to you that doesn't and take 4-5 months to fix the issue and pay out the correct party. PROs are

not good at moving backwards and traditional databases don't often store the state.

When considering the variety of players with their own standards, Benji states during the

interview, "If I was running a label, I would tell all the blockchain tech creators to come to the office and

compete. There should be someone in a role whose sole role is managing this process. A competition will

quickly weed out bad ideas. And offer a contract and millions of dollars to the winner, because ultimately,

you'll save more than that by getting a solid solution up and running" (personal communication, October

31, 2019).

Currency Standardization. New legislation requires the party charged with violations have

intent and/or actual knowledge. The lack of direct communication between the parties could be a problem

as financial services usually need to comply with rules pertaining to knowing one's customer.

Blockchains and payment networks may soon be exempt, so some countries have severely restricted or

banned cryptocurrencies (Gilmore, 2017). If the author's platform is a global or cross-country network,

this could be a huge issue. It seems more reliable to utilize the network with an already federally approved

currency for which many guidelines and governing parties have already been developed.

Casey Rae comments, "Cryptocurrencies are volatile. Bitcoin is powered through mining of coin

that takes a great deal of processing power. There's an environmental impact of operating that kind of

system at scale and sustainability is a concern" (personal communication, November 15, 2019). Steve

Stewart's response to this when speaking with the author is that global artists with deals are not going to

want to deal in tokens. The solution might be to stop thinking of tokens as currency and more of a

tracking device like a cookie (personal communication, October 28, 2019).

Ownership Determination. Just because one is the first to register a copyright doesn't mean he

or she is the rightful owner. Perhaps, guidelines for determining ownership will be similar to patents

where the first to file is deemed as the owner, and digital signatures will be complementary,

supplementary, or the only means needed for evidence to provide rightful ownership. A Nevada bill

deemed smart contracts and blockchain signatures acceptable records under law and an Arizona legislator

wants to amend state law to make a signature blockchain a legal signature under Arizona law (Gilmore,

2017).

The question is how much "trustiness" of ownership needs to be established before it's

considered "trustworthy" and holds up in a court of law? Institutions currently involved in the verification

process for IP would need to reform accordingly (De Leon and Gupta, 2017). The author believes policies

already around audio fingerprinting would be relevant for determining origin (music fingerprinting, n.d.).

There are too many sources of revenue working with different standards. Consensus among major recorded music companies, music publishers and PROs is needed. But also policies and laws need to be re-evaluated around these decisions.

Universalization

We need to reach critical mass adoption and can do so in one of three ways: 1) a major label could put all their data on the blockchain, 2) a major PRO could put all their publishing data and splits on a blockchain for real-time payments of performing rights revenue, or 3) the indie community could collectively agree to embrace blockchain for payments from the use of their music (e.g. ConsenSys' Ujo Music's attempt). The latter would be more disruptive, because it would create a structure or business that bypasses the established players.

Perhaps, potentially impacted parties should start thinking of each other as partners rather than opponents. In the interview with Bruno Guez, he brings up a good point: When blockchain platforms get utilized in some markets such as South Africa where distribution is controlled more by telecommunications than brands like Spotify, that's where there might be some growth. What PROs should do is collaborate with the blockchain providers. The Original Works' wallet, for instance, is a gateway since it also deals with mobile payments and can be white labeled -- so there's a lot of opportunity for channel partners to get in on it early (personal communication, November, 12, 2019).

Continued Investment in Development

The underlying transaction speeds are an issue. It requires too much computing power. The tech needs to be developed further and then we move into the awareness stage. Open Music Initiative is engaging this process. The fear will come if introducing a tech that isn't fully developed with proof of concept -- so rather than scare people away from it, waiting until it's more developed could build consumer and industry confidence in the tech. More investment in new tech that is exploring this space,

unless researchers and developers have an ICO which begets money itself. This will allow people to test, build, and scale faster.

Parties can be in agreement but the technology may not be able to handle the complexity of relationships, dynamically changing triggering options for specific benchmarks or modifying royalty rates depending on the popularity of a composition (De Leon and Gupta, 2017). It makes the industry heavily reliant on those who understand the technology and it would be a tedious process to program and reprogram a formula. Still, do we hold up progress in practically applying the technology? As mentioned before, no technology is ever perfect and will be constantly undergoing updates.

That being said, this will require policy as to who creates the formula, how often can it be changed given such reliance — especially if we're looking at this on a larger scale platform that would be universally adopted. One can look to the GRD to find failures with trying to develop something like this, which will hopefully give some insight into where policies can be improved (Milosic, 2015).

It is likely that an algorithmic standard will be developed over time with those programming having to execute in a variety of mimicked real-life scenarios and it becomes the greatest battle since MP2 vs MP3. It would almost seem there would need to be several off-the-shelf standards to make the adoption of it more efficient.

Find a Use Case That Makes Sense

The change of rights ownership which occurs globally every day makes people wonder whether digital rights management is the area it can best be applied. Suggestions have been made by many of applying to streaming platforms and fan tipping. In fact, Tencent in China with QQMusic already has independent artists putting music up and getting tips. "WeSing, power users with six-figure follower counts can earn as much as 50,000 yuan (US$7,300) a month in tips from fans during live-streams—and that's after Tencent takes its steep 70% cut of revenue" (Hu, 2018). An alternative streaming service that really cracks the social engagement code, so that individuals see value in not being on a well-established

platform with major industry players, might be another route. The question remains will it be easier to get major players on board vs. trying to disrupt what has already been adopted and established?

Earning from Providing Value

A shift in mindset needs to happen with artists taking more of an active role in policy changes, speaking out, being willing to go independent. It's time to think of the artist, and her/his priorities and necessities first. They want the money they deserve. If that's the industry's mindset, we would've adopted the technology all across the board already. If one is providing value to a large market, money will come. This is comparable to the mindset of Amazon's Jeff Bezos in that if the consumer is put first, it's always the right decision. In the author's interview with Bruno Guez, he says "it's all about user experience" (personal communication, November, 12, 2019).

Promoting Proper Education

The majority of blockchain experts are "techie", not really understanding artist and industry sentiments, psychological hurdles, distribution of power in the music industry and how the business and politics work. The people that do understand this are not tech savvy enough to understand and apply blockchain and its capabilities. Thought leadership and education of what blockchain is are sorely needed such as dispelling the idea that blockchain is a cryptocurrency in and of itself. Right now, there's not a well-known method or source to broadcast changes to a group and suss out bad actors or changes. Advancing the knowledge of how blockchain can help establish better transparency between musicians and their network of affiliates will help. Rather than focus on the tech itself, focus on the value to the end user. Think of a super user friendly application and a simple language to start.

There is some debate on how in-depth education should go. Some say, don't teach about blockchain; provide a product they can use that works. Don't ask artists to be blockchain specialists. Others might feel a better technical understanding would make users feel better about any concerns with use of the products or apps being developed, if they are to use directly.

Address New Piracy Concerns with Policy Adjustments

A digital ID, fingerprint or some other form of authentication is needed to deter any person from asserting ownership rights to content they do not actually own. That being said, part of a Network Effect for major buy-in can be that claims are being made on a platform that draws them in to confirm or deny.

As we know there is a need to adjust policies and laws, there have been some trailblazers setting a roadmap for how we might go about starting to do so. At least seven states have enacted or adopted laws that reference blockchain: Arizona, Delaware, Illinois, Nevada, Tennessee, Vermont, and Wyoming. A search for "blockchain" in the legislation-tracking database LegiScan pulls up five bills that were last acted on in 2017 and 19 that were acted on in 2018. Hawaii, New York, Colorado, Nebraska, Vermont, Virginia, Florida, Maryland, and North Dakota are among the states considering bills around blockchain or cryptocurrencies (Jeffries, 2018).

Some more notable policies are a bill in Vermont that made records verified through blockchain technology admissible in court (Gilmore, 2017), or a Wyoming decree that some cryptocurrencies issued on blockchain will not be regulated under state securities law (Jeffries, 2018).

All that said, the consistency across the nation and globally is a bit trickier and lawmakers could be passing bills without truly understanding the technology. Still, it signifies that policy makers are thinking about what might need to be adapted and taking steps in the right direction.

What the author found in her research is that it wasn't necessarily that people disagreed on approach as much as the order it should go in. There's a lot to tackle and it all seamlessly has to come together in tandem for others to want to adopt.

Conclusion

While there was a good amount of public research and conversation around blockchain technology as a potential solution to help indie artists get paid faster and more accurately, some of it

seems to be due to a lack of understanding of the core causes of major industry issues and the more accessible alternatives available for resolving those.

Not to say that blockchain technology isn't a development that could potentially lead to a positive shift in the music industry based on its increased security confidence and ability to automate more time consuming manual tasks, but it has a long way to go for us to conclude market fit and adapt policies for its wider adoption. If blockchain were to be applied, it could more easily be tested for newer songs and compositions than trying to wait for the major players to clean up and digitize previously created and distributed music to be ready for input. Thus, universalization of this technology is further down the line in industry priorities.

This is not to say that indie musicians can't start utilizing platforms that run on blockchain or start being involved in beta tests for potential solutions like the Original Works' Wallet that require less technical knowledge to see the tangible benefits from in the interim -- but there needs to be some patience while the kinks are being worked out.

While evaluating what these priorities might be, the adoption hold-ups and the proposed alternatives for which the initial literature seemed lacking in coverage, many in the industry thought considering blockchain was putting the cart before the horse. While blockchain could be applied more easily for recorded music, if the underlying composition rights holders could still not be identified -- due to the complexity of context that smart contracts are unprepared to handle -- blockchain may not only be an incomplete solution, but actually cause additional problems if prematurely being utilized.

Coming back to the core problems of inefficiencies and inaccuracies in digital rights management, the first step would seem to be within standardization of how we manage and clean data -- because whether on a blockchain platform or not, bad data in equals bad data out. Thus, a strong resounding sound from across the board seems to be working toward cleaning and updating current

databases period as a good starting point. Then, hopefully, blockchain development and testing efforts

will continue in tandem and be prime for when the industry is ready to take on its next challenge.

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