

**MUSIC STREAMING AND COPYRIGHT
MANAGEMENT THROUGH BLOCKCHAIN-
SMART CONTRACTS: FUTURE REALLY AS
BRIGHT AS IT SEEMS?**

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Abstract

The term “Blockchain” has been one of the most often used words in recent times, and most recently, its interface with the law and the resultant applications have been a point of research for academics and practitioners alike. Even the Government of India has been releasing studies via the NITI Aayog regarding the application of the blockchain in the legal sphere in India. However, the focused research required to implement this new-age technology into the different spheres of the legal regime has been halted due to the heavy requirement of research vis-a-vis the amendments and novation required to the existing regime of laws. The problem is reflected by the lack of research in the field of the fast-growing music streaming services in India.

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The problems that are visible due to the lack of literature and research in this niche topic that this paper seeks to explore are first, blockchain, and its effects in the legal sphere of things. Second, the prevalent intellectual property issues concerning streaming services. Third, the interplay of these services with blockchain technology, especially smart contracts, the resultant IPR solutions and possible drawbacks of the advanced technology. Lastly, the authors seek to resolve the possible amendments and novation to the existing legal regime and focus on a holistic analysis to arrive at a conclusion as to the necessity of such a technology's integration with the IPR regime considering its pros and cons.

I. INTRODUCTION

The term “blockchain” has been celebrated as a revolutionary technology, and most recently its interface with the law and the resultant applications have been a point of research for academics and practitioners alike. Blockchain is touted to be the next big thing in the transformation of activities in the digital world. It is a rather tedious, meticulous, and technical innovation. The usage of this term is in vogue due to the surge in the usage and number of cryptocurrencies, most famously represented by Bitcoin, as blockchain was primarily developed to support Bitcoin operations.¹ The world of

¹Satoshi Nakamoto, ‘Bitcoin: A Peer-to-Peer Electronic Cash System’ (*Bitcoin*, 2008) <<https://bitcoin.org/bitcoin.pdf>> accessed 12 May 2021.

cryptocurrency runs on blockchain, and as a derivative has provided a lot of traction to the concept of blockchain. However, the usage of this technology is rather far-reaching. It is not surprising that various governments around the world, including India, are looking to incorporate blockchain into their administrative systems.² It is interesting to note that in the introductory stages of the creation of blockchain technology, one of its common applications was to identify the point of creation and documentation of any entry, especially patentable ideas.³ The management of intellectual property on a blockchain has been a topic of debate in recent years, and the applications of the technology are immense.

One of the most interesting applications of this technology is in the world of music. The music industry has been notoriously plagued with various issues ranging from exploitation of artists by big publishing houses, and the involvement of a plethora of intermediaries between the artist and the consumers. This paper seeks to analyse the application of blockchain technology in the area of copyright and music streaming. To that effect, this paper dives into the structure and framework of blockchain and what qualifies it to be the next best thing. Secondly, the paper analyses the structure of copyrights in the music industry, the implications of a conjunction between blockchain and copyright registration, and usage with a special focus on music and music streaming. The paper finally looks into the application of smart contracts, a derivative and feature of blockchain, and the haranguing problem of royalty payments in the world of music streaming and the possible implications. Lastly, the paper concludes by weighing in the effect of adopting blockchain as proposed, and offers certain suggestions and policy changes.

²Lesa Moné, 'Which Governments are Researching CBDCs Right Now? [2021 Update]' (*Consensus*, 6 April 2021) <<https://consensus.net/blog/enterprise-blockchain/which-governments-are-using-blockchain-right-now/>> accessed 12 May 2021.

³Stuart Haber & W. Scott Stornetta, 'How to Time Stamp a Digital Document' (1991) 3 *Journal of Cryptography*.

II. BLOCKCHAIN TECHNOLOGY: WORTH THE HYPE?

Blockchain is based on the sole principle of eliminating intermediaries while conducting transactions.⁴ For this, the technology is based on three essential components: *The decentralization of entries, a consensus based system dependent on different forms of consensus protocols and the inability to tamper with the records or immutability.*⁵

The system of decentralization is based on the network of computers that operate together in a blockchain. Every individual system on the network of computers is called a node, and each node belongs to a separate user. These nodes come together to form a peer-to-peer network and the operations of the network are based on certain identifiers and exchange.⁶ Every user on the peer-to-peer network has a public key, a private key to conduct transactions, and lastly, any form of data which is called a token, with the most common example of a token being a cryptocurrency.⁷ This entire process is rather elementary in its conception and makes transactions straightforward in nature. Decentralization essentially translates into the removal of the data in the network from one location or authority to multiples systems, or nodes, across the network. This qualifies the immutability of the blockchain.⁸ The entire process of decentralization has been famously divided into three components by the founder of Ethereum,

⁴Roger W.H Bons & others, 'Potential and limits of Blockchain technology for networked businesses' (2020) 30 *Electron Markets* 189.

⁵Elizabeth S. Ross, 'Nobody Puts Blockchain In A Corner: The Disruptive Role of Blockchain Technology In The Financial Services Industry And Current Regulatory Issues' (2017) 25 *Cath. U.J.L. & Tech.* 353, 360-61.

⁶Paul H. Farmer, Jr., 'Speculative Tech: The Bitcoin Legal Quagmire & the Need for Legal Innovation' (2014) 9 *J Bus & Tech L* 85, 88-89.

⁷'How Does Bitcoin Work? - Bitcoin' (*Bitcoin*, 2022) <<https://bitcoin.org/en/how-it-works>> accessed 13 May 2021.

⁸Nathan Fulmer, 'Exploring the Legal Issues of Blockchain Applications' (2019) 52 *Akron Law Review* 170.

VitalikButerin. According to him, this system of decentralization is based on architectural, political and logical decentralization.⁹ Architectural decentralization is the anatomy of the network, with the number of nodes present in the network and the overall capacity of the network; political decentralization is the control over the network, essentially the number of authorities within the network who have control over its activities; and lastly, logical decentralization is based on the ability of the network to function in conjunction as a whole, or also in segments. In terms of blockchain, there is architectural and political decentralization as there is no unilateral control over the activities and because there can be an unlimited number of nodes as the pressure is not on the infrastructure since all systems operate independently.¹⁰

Consensus protocols are necessary in blockchain because of its decentralized character.¹¹ This stems from the point that there is no central authority to confirm the validity of an entry or the data, and therefore, consensus protocols exist in order to maintain the trust between the different users in the network as well as to maintain the consistency in the data across the network.¹² The consensus protocols are essential for the progress of the blockchain as a new block can emerge via the presence of a single truth across the network, thereby eliminating the presence of a third party overarching the entire network to ensure consistency and valid entries. However, there are different types of blockchain: *permissionless and permissioned*.

⁹Buterin Vitalik, 'The Meaning of Decentralization, Medium' (*Medium*, 4 September 2013) <<https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274>> accessed 10 May 2021.

¹⁰M. Anderson, 'Exploring Decentralization: Blockchain Technology and Complex Coordination' (2019) *Journal of Design and Science* <<https://jods.mitpress.mit.edu/pub/7vxemtm3>> accessed 9 May 2021.

¹¹Kevin Werbach & Nicolas Cornell, 'Contracts Ex Machina' (2017) 67 *Duke LJ* 313, 327.

¹²Shehar Bano & others, 'SoK: Consensus in the Age of Blockchains' (*AFT 19: Proceedings of the 1st ACM Conference on Advances in Financial Technologies* 2019) <<https://dl.acm.org/doi/10.1145/3318041.3355458>> accessed 9 May 2021.

Within a permissionless blockchain, any and every user can make entries or transfers, but the responsibility and authority to ensure the validity of such changes is vested with a limited number of users across the network.¹³ Permissioned blockchain can practically use the same mechanisms as a permissionless blockchain, but there is already a trust assumption within these blockchain,¹⁴ and the former can therefore operate with far simpler approval mechanisms.

Immutability is a fundamental property of blockchain.¹⁵ It is an impressive selling point of blockchain, as the value of blockchain increases manifold due to the tamper-proof nature of the data within its structures. This is essentially dependent on the links between the different blocks that form the chain. The code (hash value) of the previous block is found in the header of the subsequent block. As the chain increases, the data is increasingly secured due to the large number of blocks that have the cryptographic code of the parent block. Therefore, any attempt to manipulate a single block will fail as it is linked to all the other blocks and such an attempt would involve the change in the code in all the other blocks in the chain.¹⁶ Accordingly, an inaccuracy in the code across the chains due to any manipulation can be easily detected and therefore renders the data almost absolutely secure.¹⁷

¹³K. Wüst & A. Gervais, 'Do you Need a Blockchain?' (2018) 2018 Crypto Valley Conference on Blockchain Technology (CVCBT) 45.

¹⁴Primavera De Filippi & others, 'Blockchain as a Confidence Machine: The Problem of Trust & Challenges of Governance' (2020) 62 *Technology in Society* <<https://www.sciencedirect.com/science/article/pii/S0160791X20303067>> accessed 10 May 2021.

¹⁵E. Polito & others, 'Blockchain Mutability: Challenges and Proposed Solutions' (2019) *IEEE Transactions on Emerging Topics in Computing* 1, 5.

¹⁶F. Tschorsch & B. Scheuermann 'Bitcoin and Beyond: A Technical Survey on Decentralized Digital Currencies' (2016) 18 *IEEE Communications Surveys & Tutorials* 2084, 2096.

¹⁷E Polito (n 15).

Despite all the novelty of this technology, there still remain several doubts as to its practical application. The largest of these concerns is the implementation of the widespread usage of the network. The explanation of the working of blockchain is rather elementary in nature, whereas the actual process has several forms of know-how required to be able to utilize the network efficiently. Moreover, the system of decentralization assumes that all users, especially smaller companies and organizations, have sufficient resources to undertake the massive investment required to maintain a large system of decentralized databases. The cumbersome economic investment in terms of a large system of nodes may end up defeating the monetary benefits of blockchain. The consensus protocols mentioned above have an entirely separate area of literature that discuss the power consumption of systems in order to fulfil the protocols, a cost that may be too high for smaller users.

In toto, the technology is indeed exciting and prospectively useful in its application in transactions across the world. However, India has not embraced the change brought about by cryptocurrency with ease. The Indian Ministry of Finance and the RBI had issued several advisories against virtual currencies.¹⁸ The RBI then published a notification in April 2018 prohibiting activities vis-à-vis virtual currencies,¹⁹ in an attempt to end the debate altogether. This was further exacerbated by the report of an inter-ministerial committee of the Finance Ministry which submitted a report and a draft bill in support of banning cryptocurrencies in India.²⁰ However, the RBI

¹⁸Reserve Bank of India, 'RBI cautions users of Virtual Currencies against Risks' (24 December 2013); Reserve Bank of India, 'RBI cautions regarding risk of virtual currencies including Bitcoins' (5 December 2017); Press Information Bureau, 'Government Cautions People Against Risks in Investing in Virtual 'Currencies' (Ministry of Finance, 29 December 2017).

¹⁹Reserve Bank of India, 'Prohibition on dealing in Virtual Currencies (VCs)' (Notifications, 6 April 2018).

²⁰Department of Economic Affairs, 'Report of the Committee to propose specific actions to be taken in relation to Virtual Currencies' (Ministry of Finance, 22 July 2019).

circular banning virtual currencies was challenged before the Supreme Court of India. In the judgment dated 4 March 2020, the Supreme Court quashed the RBI circular banning virtual currencies.²¹ The Court stated that the restrictions were disproportionate to the concerns raised by the RBI as none of the concerns raised had fructified or caused any adverse effect to RBI's regulated entities. There definitely has been progress since the judgment, and there is heavy speculation of the government introducing a legislation to clarify its stance on cryptocurrency as a whole.

While blockchain brings inherent changes to all spheres of administration, its application in the area of copyrights and especially music streaming can be a revolutionary step. This is the primary question we seek to answer in this paper. Prior to that, we will delve into the problems within the industry as it stands.

III. COPYRIGHTS' NOOSE ON MUSIC STREAMING

SERVICES

Music in its existence and substance has inevitably gone through multiple trances of change and has evolved over time, and so has the way in which it can be accessed and streamed. The easiest way to enjoy music is through streaming services which provide enough options and personalization features to nearly weed out all the primitively accepted modes of access. While this might be a cultural shift, the vital question remains to be the effect of such streaming service-driven vehicles on the mechanism of writing and recording works by the artists. The deeper question that needs answering is

²¹*Internet and Mobile Association of India v Reserve Bank of India*, 2020 SCC Online SC 275.

whether such services could worsen the impact of numerous copyright infringement issues on the artists and artistic progression.

Typically, a song or a musical work of any kind has three components, viz., the lyrics, the composition of music and the vocal delivery.²² According to industry practice, the rights related to musical works are distinct from those related to the sound recording, also called the “*master*” recordings.²³ Master recordings are the original recorded pieces of the music that reach the audience, the piece from which all later copies are made,²⁴ and are significantly different from the elements that make a musical work, when it boils down to the protection of intellectual property. The common practice adopted by the musicians is that of owning the rights to the artistic works (lyrics, composition, et al.) and making their respective record labels the holders of the rights to the master recordings, enabling them to avail a broadcasting license under Sec-31(d) of the Copyright Act, a statutory license that can be availed by any broadcasting organisation for their published works.

The fruits enjoyed by the artists are primarily through royalty deals that are struck with the labels. Sec-13(4)²⁵ of the Copyright Act, 1957 clearly emphasizes that the copyrights of a sound recording (held by producers) do not prejudice the copyrights existing with the original works. The rights to the works can be held by the “author” of the work and the positions of the artists and the producers fall into the definitions of an “author” under Sec-2(d),²⁶ sub-clauses (ii) and (v) of the Copyright Act. This view was further clarified in *Indian*

²²Elizabeth Verkey, *Intellectual Property Law and Practice* (1st edn, EBC 2015) 54-57.

²³Ann Herman, ‘You Belong With Me: Recording Artists’ Fight For Ownership Of Their Masters’ (2021) 18 NWJ Tech & Intell Prop 239.

²⁴Elizabeth Vulaj, ‘Singing a Different Tune: Taylor Swift & Other Artists’ Fight for Music Ownership’ (2020) Practitioner Insights Commentaries.

²⁵The Copyright Act 1957, s 13(4).

²⁶The Copyright Act 1957, s 2(d).

Performing Right Society Ltd. v. Aditya Pandey & Ors.,²⁷ where it was observed by the Hon'ble High Court of Delhi that the artists and the record producers are equally entitled to their respective rights to royalty in the case of a sound recording, which doesn't form a part of a cinematograph film. Although this case seems to provide positive adjustments to artists, its scope and precedent-setting value is limited on two points. **Firstly**, a distinct provision included through the Copyright Amendment, 2012, under Sec-19(9)²⁸ clearly states the impermissibility of any assignment of copyrights to make a cinematograph film to affect the entitlement of the authors to revenues through royalties even through the films. This provision was not applied in the *IPRS case*,²⁹ since the suit was filed before the amended provision came into force and a retrospective application by the court was not possible. **Secondly**, the judgement provided excessive control to the corporate behemoths over the copyrights to the recordings, minimizing the fruits that could potentially go to the artists as the concept of music is strongly entwined with the film industry in India. The "*doesn't form a part of a cinematograph film*" part of the decision deprives the already subjugated artists in the grand scheme of things, and this leads to further abuse of power held by the recording companies.

It is important to observe that even though royalties are guaranteed to the artists, the ability to exercise control over the master sound recording of a cinematographic work lies predominantly with the producers, capacitated by Sec-17 of the Copyright Act. This is problematic as the artists' have minimal or possibly no amount of control over the very work they have created. This is because of the bifurcation of the rights into the work itself and the recorded master.

²⁷*Indian Performing Right Society Ltd. v. Aditya Pandey & Ors.*, [2011] FAO (OS) No. 423-24.

²⁸The Copyright Act 1957, s 19(9).

²⁹*Indian Performing Right Society Ltd.* (n 27).

Unfortunately, this is general practice in copyright law and the producer doesn't require a license from the artists to abuse the recordings. Recently, popular artist Taylor Swift tried to regain copyrights to her catalogue and the latter's masters were sold by Scooter Braun without her knowledge,³⁰ raising questions on corporate hostility towards artists. The recording companies in such instances hold the power to dictate the road to the artist's legacy. If negatively exploited, this offends a vital objective of Intellectual Property rights, that is, to breed creativity by providing benefits to the creator. A lack of sufficient security is the rooted reason.

A viable solution to the problem is that the artists must proceed with careful negotiations with the recording corporations about rights relating to the masters. A reversion of the rights of the masters to the artist after a certain duration can be agreed upon beforehand to bring some amount of control to the artist; artistic and commercial. This is very beneficial to the labels too as they get to exploit the bearings of the works for a specific period of time immediately after the release of the work, when it is trending, to make enough profits out of it before transferring it over to the artists. This way both the artists and the labels are mutually rewarded. A major drawback to this would be the meagre amount of leverage held by budding independent artists who cannot afford to effect such deals due to multiple factors, mostly due to lack of financial grounds but such contracts nonetheless are an excellent path for established artists.

A. *Rights related to Musical Works on the online streaming paradigm*

Popularisation of online streaming occurred once the lawmakers in the United States decided to wage a war on the unethical peer-to-peer

³⁰Ann Herman (n 23).

technology-powered music sharing website, Napster,³¹ which was notorious for giving life to a number of similar platforms circumventing copyright laws in the US.³² The rationale for creating such streaming services is to *curb music piracy* and to *exploit the widespread demand for online music through a safe, secure and sans malware-spreading platform*. Music streaming services like Spotify, Soundcloud, Deezer, Tidal and others are very popular due to easy accessibility, low costs, enough consumer discretion, and a humongous cupboard of content to pick from.

The popular working models of streaming services have been subscription-based, the providers making content available depending on the subscription packages offered,³³ giving enough control to the consumers and to the providers to offer several options in services depending on choices, premium or otherwise. Such extra options include deluxe versions of old albums, remastered versions, unplugged versions, covers and extra bits as part of their collection. Streaming is a form of public performance when it is narrowed down to the calculation of royalties, which relies on the number of times a recording has been played.³⁴ The distinction between a normal public performance and online streaming is that the latter is an interactive service that gives the users enough power functionally to channelize their wants into liberally picking and replaying pieces when desired.

³¹Laura Sydell, 'Napster: The File-Sharing Service That Started It All?' (NPR, 2009) <<https://www.npr.org/2009/12/21/121690908/napster-the-file-sharing-service-that-started-it-all>> accessed 12 May 2021.

³²Ariel Bershadsky, 'RIAA v. Napster: A Window onto the Future of Copyright Law in the Internet Age' (2000) 18 John Marshall Journal of Information Technology and Privacy Law 782.

³³Sandeep Nair, 'Winning the streaming wars in India' (Medium, 9 Nov 2020) <<https://sandeepnair85.medium.com/winning-the-streaming-wars-in-india-92190e4ecfb3>> accessed 12 May 2021.

³⁴Donald Passman, *All You Need To Know About The Music Business* (Simon & Schuster 2019).

To be able to broadcast artistic works, streaming services must obtain licenses from the right holders for the creations that they wish to stream. While this sounds like a simple procedure to be followed to a seamless and secure business environment, it is not. Sec-31(d)³⁵ of the Copyrights Act outlines the requirements for a statutory license for the broadcasting of “*literary and musical works and sound recordings*”, but the Hon’ble High Court of Bombay interpreted this provision to not cover broadcasting through the internet in the case of *Tips Industries v. Wynk Music*.³⁶ This decision is problematic as the stance of the Court and that of the Department of Industrial Policy and Promotion (according to its Office Memorandum notification³⁷ released on 5th September 2016) run contrary to one another. The latter had definitively called for the non-restrictive interpretation of a ‘*broadcasting organisation*’ to include internet broadcasting as it must be construed with the words “*communication to the public*”, which broadens its scope into not just radio and television broadcasting as Sec-31(d)³⁸ seem to prima facie apply to.

The wordings of Sec-31(d)³⁹ are insufficient for narrowing down the scope of a broadcasting organization. Section Sec-31(d)(1)⁴⁰ itself uses the term “*any broadcasting organisation*”, whereas the rest of the provision subscribes to just “*broadcasting organisation*”, specifically sticking to outlining the application of rights and royalties to *radio and TV* broadcasting. The wordings of this provision were closely observed by the High Court in the *Tips Case*,⁴¹ wherein it was concluded that specific emphasis rested on defining and differentiating between radio and TV broadcasting rights within the

³⁵The Copyright Act 1957, s 31(d).

³⁶*Tips Industries Ltd. v. Wynk Music Ltd.*, [2018] Notice of Motion (L) No. 197 of 2018 in Commercial Suit IP (L) No. 114 of 2018.

³⁷Department of Industrial Policy and Promotion, Government of India Office Memorandum (5 September 2016).

³⁸The Copyright Act 1957, s 31(d).

³⁹*ibid.*

⁴⁰The Copyright Act 1957, s 31(d)(1).

⁴¹*Tips Industries Ltd.* (n 36).

section. In addition to that, it reflected the legislative intent of the Parliament to narrowly administer the provision intentionally in order for it to apply only to radio and TV broadcasting, despite being aware of internet streaming services, which in turn resulted in internet broadcasting to be considered to be beyond the scope of the section. It was observed that interpreting Sec-31(d)(1)⁴² in isolation would be inappropriate due to lack of conformity with the remainder of the section. This line of reasoning by the Court is justified in the specific case, since it dealt with online broadcasting that included “*download and purchase of material*” which might not be termed just ‘*internet broadcasting*’ in a sense. However, precluding internet broadcasting as a whole from the scope of Sec-31(d)⁴³ is hazardous considering typical streaming services as broadcasters fall rudimentarily into the wide definition as laid in the first sub-section.

The rationale behind striving to enable internet broadcasters to obtain statutory licenses is to bridge the gap between the extremes of control enjoyed by the master right holders and the artists (which are exclusive in most cases in India), as the decisions regarding broadcasting and further royalties earned through the same are predominantly taken by the labels, leaving the artists with very little say over their work when labels decide to hold back content according to their needs. A broader application will compel the master right holders to make available the works to any service provider in a universalized manner, providing significantly more royalty-driven benefits to the artists. This indeed overcomplicates the issue. As a solution to this twisted system, booming technological advancements have created a substitute that allows the artists to directly engage with their users, acting as their streaming service

⁴²The Copyright Act 1957, s 31(d)(1).

⁴³ibid s 31(d).

provider directly through blockchain. How much lesser of an evil is this is a pertinent question.

IV. COPYRIGHTS AND BLOCKCHAIN IN THE MUSIC

INDUSTRY

A debate over the application of blockchain technology in the music industry has emerged in the past few years. The implications of introducing the technology in the sector could be immense. However, as explained in Chapter II, the technology is not devoid of issues. In terms of the application of the technology in the music industry, the most important area it would transform would be copyrights, vis-à-vis music.

As explained above, the current regime of copyrights is rather problematic. An elementary issue is the lack of information as to the holder of a copyright. Most jurisdictions, such as US⁴⁴ and India,⁴⁵ consider the existence of copyright from the moment of the creation of an original work. The lack of information leads to multiple disputes, with various streaming services sued regularly for using music without acquiring the ownership of the songs.⁴⁶ Spotify has made attempts to counter this problem by trying to venture into blockchain technology to better identify the holders of copyrights.⁴⁷ The next issue is about the high transaction costs of licensing

⁴⁴17 U.S.C. s 102(a); *Fourth Est. Pub. Benefit Corp. v. Wall-Street.com*, [2019] LLC, 139 S. Ct. 881, 887.

⁴⁵*Sanjay Soya (P) Ltd. v. Narayani Trading Company*, 2021 SCC OnLine Bom 407; Indian Copyright Act 1970, s 45, s 51.

⁴⁶Camran Ferrier, 'Copyright Infringement Liability in the Music Industry' (2021) Music Business Journal <<https://www.thembj.org/2019/09/copyright-infringement-liability-in-the-music-industry>> accessed 12 May 2021.

⁴⁷Sarah Perez, 'Spotify Acquires Blockchain Startup Mediachain to Solve Music's Attribution Problem' (*TechCrunch*, 26 April 2017) <<https://techcrunch.com/2017/04/26/spotify-acquires-blockchain-startup-mediachain-to-solve-musics-attribution-problem>> accessed 12 May 2021.

copyright by the author, as these rights are distributed between various representatives of the author, and this leads to high costs for the consumer and a delay in receiving payments for the artist.⁴⁸

In terms of music streaming services, a major problem, as identified in the previous section, is the system of control exercised by the agents and publishers, which then creates an opaqueness in the transactions relating to the copyrighted work and the revenue generated from such transactions. This lack of transparency cuts the artists and the holders of the copyright out of the usage and further licensing of their work, which then creates an imbalance in the distribution of the revenue generated from such licensing. A large number of middlemen, especially the large music conglomerates that dominate the business, leads to artists earning pennies on the dollar for the usage of their creation.⁴⁹

In terms of cutting the problem of copyrights, blockchain presents unique solutions. The creation of copyright from the moment an original song is produced leads to the problem of inadequate information, which then forms the crux of other issues. Songs are often written in peculiar circumstances, and with rather different timelines that can involve a lot of people. For instance, Lady Gaga took about 10 minutes to write her first hit “*Just Dance*”, which was also the case with artists like Lorde and Adele. However, certain songs such as the timeless hit “*Bohemian Rhapsody*” by Queen took close to six years. These varying periods can lead to the involvement of multiple individuals in the writing and creation of the song. A

⁴⁸Sebastian Pech, ‘Copyright Unchained: How Blockchain Technology Can Change The Administration And Distribution Of Copyright Protected Works’ (2020) 18 NWJ Tech. & Intell Prop 1,7.

⁴⁹Ignacio De Leon & Ravi Gupta, ‘The Impact of Digital Innovation and Blockchain on the Music Industry’ (Paper No. Idb-Dp-5 49, 2017) Inter-American Development Bank: Competitiveness, Technology and Innovation Division Discussion.

register of copyrights based on a blockchain can resolve such an issue by creating multipart ownership over the copyright. This would be done by dividing the copyright into multiple segments and uploading it in a new format consisting of metadata which in turn consists of multiple pieces of information about the creation of the song.⁵⁰ This data would include all contributors to the track, such as managers and writers and recording directors and various other possible persons. This would also create easy remittance of royalty payments via smart contracts, as explained in the next section. The copyrights placed on the blockchain will be furnished with reliable information, due to the nature of the blockchain.⁵¹ The decentralized system would allow any artist to file copyright at any point without having to go through a central authority in an expedited manner.⁵² Only after the consensus protocols are fulfilled and the systematic check is complete would the new copyright be placed on the server.⁵³ Furthermore, as explained in Section II, the immutable nature of the blockchain protects the information from any tampering, thereby creating a long term, reliable and low-transaction-cost distributed ledger of copyrights.

In terms of the effect of copyrights on the blockchain for the music streaming industry, a major cost reduction would be in terms of the knowledge of the ownership of the song. But with all the information about the track available on the blockchain, it would reduce the costs borne by streaming services in identifying artists and seeking their permission to play the songs they created.

The biggest hurdles faced by musicians in the recent years with regard to their intellectual property is the usage of the internet and

⁵⁰Jean-Maxime Riviere, 'Blockchain Technology and IP – Investigating Benefits And Acceptance In Governments And Legislations' (2018) 3 Junior Management Science 1, 7.

⁵¹Balázs Bodó & others, 'Blockchain and Smart Contracts: The Missing Link in Copyright Licensing?' (2018) 26 Int'l JL & Info Tech 311, 328, 330.

⁵²Sebastian Pech (n 48).

⁵³Kevin Werbach (n 11).

flouting of copyright protections.⁵⁴ The development and misuse of the applications of the internet world have outpaced the developments in the legal sector and the menace that is piracy as well. For example, in *Public Relations Consultants Association v. Newspaper Licensing Agency Ltd*,⁵⁵ the Court of Justice of the EU ruled that any transient copies that are created as a result of browsing a website must fulfil the conditions required for the Article-5(1) exception of the EU Directive to apply, which is the exemption of liability for temporary acts of reproduction, if they are integral to the process.⁵⁶ In this manner, the economic control of an artist over their music is broken.

The law surrounding piracy and temporary acts of reproduction is not favourable to artists, and the blockchain can restrict this menace. However, regarding piracy, there have been concerns that blockchain would render it impossible to identify infringers of copyrights and pin liability.⁵⁷ However, a truly functional blockchain would solve these issues. Since the copyright on the blockchain consists of metadata with a unique digital footprint, any unauthorized copies of the same can be easily located. These copies can then be nullified, or if any revenue is generated from them, it can be claimed by the artist.

V. SMART CONTRACTS AND COPYRIGHTS

As much as artists would love to etch their name in history with their works, on a commercial road, their works are single-handedly controlled by the record industry. Progressive rock goliath Pink

⁵⁴Sebastian Pech (n 48), p.8.

⁵⁵*Public Relations Consultants Association Ltd v. Newspaper Licensing Agency Ltd and Others*, [2014] C-360-13, 5 June (ECJ).

⁵⁶The European Parliament and of the Council of 22 May 2001, Directive 2001/29/EC art 5(1).

⁵⁷N. Vogel, 'The Great Decentralization: How Web 3.0 Will Weaken Copyrights' (2015) 15 *Review of Intellectual Property Law* 137,145.

Floyd's song *Have A Cigar* iron presses the pretentiousness of the record industry and their intentions to merely milk the artists. Blockchain driven technology has developed appendages to address the issue of alienation of the artists' ability to exercise the rights to their own creations by bringing in a system to enables them to license their own works and offer them directly to the users, eradicating the role of the labels and other middlemen involved. Ethereum is one such permission-less open-source system which allows the creation of concrete self-executing smart contracts which become legally enforceable once entered into after satisfying its required terms,⁵⁸ leaving a permanent trail that solidifies accountability.

Smart contracts are a set of codes that carry information that help generate transactions once the governance of the pre-determined conditions is ensured through the interaction,⁵⁹ after which each figment of the code formulates its own consensus about the end points and their execution. This is an effective tool that could be used by the artists as it carries low-transaction costs and provides a simple artist-user interaction, making it very convenient for independent artists whose works rely on fan/user interaction. However, this is not as perfect a fit as it seems.

Self-executing smart contracts are efficacious when the nature of the terms and the contract itself is rather simple. Using this to license the works of the artists poses to be a seamless mode of licensing, as these smart contracts would clarify who gets to re-use the content of the artists sans intervention. It must be noted that it prevents conflicts in its nodes, a very welcoming element to both the artists and the users.

⁵⁸Quinn Dupont & Bill Maurer, 'Ledgers and law in the Blockchain' (2015) Kings Review <<https://www.kingsreview.co.uk/essays/ledgers-and-law-in-the-blockchain>> accessed 13 May 2021.

⁵⁹Stuart D. Levi & Alex B. Lipton, 'An Introduction to Smart Contracts and Their Potential and Inherent Limitations' (*Harvard Law School Forum on Corporate Governance*, 26 May 2018) <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations>> accessed 13 May 2021.

However, allocation of autonomous digital assets without the element of trust between parties through such contracts leads to muddy waters when it comes to reliable external monitoring of further enforcement⁶⁰ or fair use of the content that is licensed - a counter-productive phenomenon when it comes to control over content.

Fair Trade Music Databases have been developed to maintain a chamber that contains all the metadata of the companies and consumers' search preferences and the digital payment information next to the content owner's specifics. Tracing consumer preferences to assist in executing micropayments is made easier through such a system⁶¹ and a curated assessment of music usage allows for flexibility in intellectual property valuation.⁶² *PledgeMusic*, a crowdfunded direct-to-fan music platform using smart contracts to make payments possible⁶³ imploded after around eight years of success due to payment issues.⁶⁴ The idea was revolutionary as it created a middle ground between crowdfunding and direct-to-fan model by inviting consumers to be part of an album's making but due to the scattered nature of releases and lack of transparency in the funds raised for business to the fans, they defaulted the payment to the artists. A primary reason for the downslide in their case, apart from management issues, was the limited scope of what services could be offered to the customers through smart-contracts without

⁶⁰Riikka Koulu, 'Blockchains and Online Dispute Resolution: Smart Contracts as an Alternative to Enforcement' (2016) 13 *Scripted* 40.

⁶¹Ewa Fabian, 'Blockchain, Digital Music and Lex Mercatoria' (2017) 14 *US-China I Rev* 852.

⁶²Andreas Gabi & Stephan Ulrich Krehl, 'Application of Blockchain Technology and Crowdfunding to Solve Structural Inefficiencies in Digital Rights and Patent-a Comparative Analysis' (2017) MIT Sloan School of Management 104.

⁶³Benji Rogers, 'How the Blockchain and VR Can Change the Music Industry (Part 1)' (*Cuepoint*, 24 November 2015) <<https://medium.com/cuepoint/bc-a-fair-trade-music-format-virtual-reality-the-blockchain-76fc47699733>> accessed 13 May 2021.

⁶⁴Ben Dickson, 'How Blockchain Can Change the Music Industry' (*TechCrunch*, 8 October 2016) <<https://techcrunch.com/2016/10/08/how-blockchain-can-change-the-music-industry>> accessed 13 May 2021.

complicating the process on the ground of scalability. This is a classic case of simplification gone wrong. Though it seemingly is an assuring model for creators to cash in with their works quickly, expediency is not the most suitable game plan if tenability in the long run is the objective. This is a justifiable example to outline how untenable an artist-to-fan model driven by even the simplest of smart contracts could be when converted into a large-scale operation.

The smart contract is given life after an immutable code is encoded into the blockchain's decentralized system and once the contract is floated into the platform, every step from thereon results in a non-repairable audit trail which cannot be erased or changed even if it is edited later, the permanent trail barely reflects the change. The basic functionality in question is with respect to rights management and royalty distribution, both of which are not the most sustained concepts. So, any amends, if required, will come with their own consequences as the blockchain system itself is pegged to every peer involved. So, if effectiveness in application must be ensured, the administrator must tread carefully, for the outcome is reliant on the individual who enters the data,⁶⁵ or it might lead to compromising the totality of the database.

Due to its immutable nature, a rigid system for royalty distribution must be concretized before being applied to blockchain because, once implemented, the structure of the system imposes a new set of complications on top of the existing ones, if any. If any fraudulent data or infringed music is entered into the ledger,⁶⁶ it remains the same and the bigger distress is that it is near impossible to hold anybody accountable if there is an absence of a controlling authority.

⁶⁵Harrison Speck, 'The Future of Music Coalition-Moral Rights Docket Filing' (*CIPA Professional Reports*, 15 May 2017) <https://ecommons.cornell.edu/bitstream/handle/1813/54766/Harrison_Speck_Prof_Report_Moral_Rights_Docket_FMC_5-15_CIPA.pdf?sequence=1&isAllowed=y> accessed 14 May 2021.

⁶⁶N Vogel (n 57).

Undeniably this technology has the potential to establish concrete copyright and music databases on the precondition that all the information is accurate,⁶⁷ but in a decentralized platform with high risk of wilful, malignant human interference (human interference being an ultimate requirement in blockchain technology),⁶⁸ it can be tampered with at any instant, considering the notoriety the industry carries.

VI. POINT OF CONJUNCTION AND WHAT IT HOLDS

The blockchain-based models simplify cooperation by multiple players involved through the platform through its transparency via efficient data sharing. However, that may not be the reality as the rights to the creations are dispersed amongst the players themselves, such as the writers, publishers, performers, and the rights management corporations. The solution of crowdsourcing to ameliorate this situation has been discussed,⁶⁹ and even though long-term consequences have been particularly negative, it is only reasonable to infer that the system has the proficiency to protect and hold the validity of the data entered into the decentralized ledger once it has been entered accurately, which is not sans problems in the first instance. Entering only maintainable and verifiable information into the system via appropriate consensus protocols must be ensured for it to work appropriately after outlining necessary dispute resolution systems to handle possibilities of conflict-plagued claims that might arise.

⁶⁷Tran Ngoc Linh Tam, 'Music Copyright Management on Blockchain: Advantages and Challenges' (2019) 29 ALBLJ Sci & Tech 201.

⁶⁸Kevin D. Werbach, 'Trust, But Verify: Why the Blockchain Needs the Law' (2018) 33 Berkeley Tech LJ 489, 527.

⁶⁹Andreas Gabi (n 62).

A complete negation of third-party involvement drastically reduces the potential for the creations to rake in strong financial fruits as the “middlemen”, though undesirable in multiplicity of ways, have political and financial power to determine the popularity of the works that reach the determined crowd. The need to understand what the artists seek out of their works is important and, if widespread commercial success is the goal, then systemized blockchain rights management systems are certainly challenged in their structure. This is because they barely bring in well-connected advertising solutions to the works or any brand value especially in a technologically crippled market like India on the grounds of remote availability.

The biggest hurdle is the complications with the application of blockchain itself. The prima facie problem is the lack of knowledge and application of blockchain. To create a database of copyrights, switch from current streaming services over to one on the blockchain, and to navigate every other technicality along the way would require the widespread application and usage of the blockchain, which is a distant dream in the present day. The other major issues surrounding blockchain, as discussed above, are the issues with scaling and consumption of power. The current blockchain systems around the world, such as Ethereum, are able to conduct 13-16 transactions per second, whereas Spotify currently has 345 million active users which require an exponentially higher transaction speed. In terms of the issue of power consumption, the largest amount of power consumed is due to the consensus protocols applied to ensure the data being place on the Blockchain is reliable and accurate. Even if the consensus protocols were tweaked to only utilize a small amount of energy, there still exists the issue of storage on the blockchain. All the songs and their copyrights placed on the blockchain will take up a large amount of energy just to be stored. Spotify adds around 60,000 new songs every day, which would create heavy power consumption. While there may still be methods to remedy the issue of power

consumption, they would further alienate the application and utilization of the blockchain by the everyday music listener.

Blockchain application in its form does not have territorial limitations and licenses can be granted to any person interested. The only precondition is that the mode of executing it must be through blockchain. This has shown much promise in promoting diversity by making niche works available worldwide, streamlining content, building a widely reachable database and potential for interference. However, if such a flexible platform becomes a breeding ground for multiple other such networks, this will create a clone of the fickle music industry⁷⁰ in no time with blinding competition.

The determination of royalties must be done according to the relevant legislation in general, but in the case of transnational interaction, putting a finger on what royalty threshold must be maintained and the relevant governing law to that respect remains an unanswered question,⁷¹ especially multiple parties are involved. Adding to the pile, the existing technology's capability of handling hefty amounts of data is very questionable⁷² and expanding requires increased number of players, which gives rise to more inconsistencies and that later makes the possibility of a universal functional structure more remote.

While the advantage of blockchain is the limited chance of copyright infringement, the question of the determination of liability and application of law is tricky. The TRIPS Agreement required all parties to implement certain minimum standards in their IPR laws.⁷³

⁷⁰John Palfreyman, 'Ten Things Blockchain Is Not' (*IBM: Govt. Industry Blog*, 2 May 2017) <<https://www.ibm.com/blogs/insights-on-business/government/ten-things-Blockchain-not>> accessed 14 May 2021.

⁷¹BalazsBodo (n 51).

⁷²Jesse Walden, 'What a Blockchain for Music Really Means' (*Medium: Mediachain Blog*, 25 April 2016) <<https://blog.mediachain.io/what-a-blockchain-for-music-really-means-e2f8dc66d57d>> accessed 14 May 2021.

⁷³TRIPS Agreement 1994, art 1(3).

While it has been discussed previously that the unique digital footprint of a copyright would enable easy detection of infringements, it still leaves the question of what happens when such infringements occur. However, the pertinent question here is not of the technical questions considering the conflict of laws/provisions or transnational agreements concerning prevention of infringement. Instead, the question is of the fixation of liability if a copyright were to be infringed upon, i.e., liability determination, which remains to be alarmingly unclear especially in transnational agreements.

With regard to the applicability of smart contracts, there does not seem to be any concerns with regard to the Indian Contracts Act as the Act is liberal in its reading, especially under Sec-10,⁷⁴ which allows any agreement to be understood as a contract if entered into with the free will of the parties, further solidified with the validity of digital signatures under the Information Technology (IT) Act and the admissibility of electronic evidence including contracts under the Evidence Act. Indian Courts have previously stated that the electronic nature of contracts will not be considered inferior to normal contracts for the sole reason that they are electronic in nature.⁷⁵ But the problem arises due to the decentralized nature of blockchain. Sec-35⁷⁶ of the IT Act requires a certifying authority, designated by the government, to verify all cryptographic signatures are valid. The decentralized nature of the Blockchain leads to a dispersed system wherein contracts are signed via digital codes called hash keys, which cannot be certified as per the requirements of the IT Act. This will also add to the encumbrance of presenting digital evidence under the Evidence Act, as Sec-85(b)⁷⁷ of the Act requires verification of these signatures as per the IT Act which cannot be done.

⁷⁴Indian Contract Act 1872, s 10.

⁷⁵*Tamil Nadu Organic Private Ltd. and Ors. v. State Bank of India*, AIR 2014 Mad 103.

⁷⁶Information Technology Act 2000, s 35.

⁷⁷The Indian Evidence Act 1872, s 85(b).

VII. SUGGESTIVE OPINIONS

- ***Time to pass a Music Modernization Act in India*** – The legislation was signed into law in the US in 2018 in an effort to help copyright law play catch up with the blindingly fast developing streaming era.⁷⁸ A similar approach would benefit the Indian story too since the whole game of streaming has been a copy fest, but more personalised legislative changes that include blanket licensing provisions, streamlined royalty determination, fair pay provisions to the songwriters and an overall mutually beneficial platform for streaming services and artists alike is a significant step ahead.
- ***Introduction of additional legal protections for traditional record industry-reliant users*** – Making this available in a blockchain-based copyright management system, in situation-specific instances where said users begin to access copyrighted works relying on the encoded information on the blockchain system and receive claims from third parties regarding infringement of their rights. Expecting wide adoption of blockchain technologies in the copyright management sphere becomes a distant possibility if such users do not possess exemptions from liability for infringement issues. Such exemptions must be tailored to suit the dynamics of the specificities of the legal system involved (for example, extension of the fair use doctrine, establishment of additional statutory copyright exemptions, good faith acquisition of a license, etc.). Such protections should be balanced with the interests of the copyright owners and should be instituted with suitable safeguards to avoid becoming a basis for subsequent abuse.

⁷⁸Ari Herstand, ‘What Is the Music Modernization Act and Why Should It Pass’ (*Digital Music News*, 1 August 2018) <<https://www.digitalmusicnews.com/2018/08/01/music-modernization-act>> accessed 14 May 2021.

- ***Protections granted only to partially Government-controlled systems*** – They should be granted only to users of blockchain-based copyright management systems, that are mildly controlled by the government authorities, flagged with a certain “blessing”. But government supervision cannot ensure balance in its singular existence. The balance itself can be ensured only with the possibility of new exemptions to reimburse financial losses incurred by right holders in case of abuse committed by users. Perhaps insurance mechanisms may assist in finding such a balance, so this direction can prove to be worthy of further research.
- ***A more incorporative application*** – Rather than adopting a generalised dabbling of the technology and creating ripples in the music system, the blockchain is better suited to be incorporated in isolation to tackle micro-issues, like using it to empower local folk artists in India by widening their availability horizons and spreading awareness in that regard as the biggest achievement of blockchain is the stir it has created, positive or negative.
- ***Handling immutability through liability exceptions*** – Blockchain platform operators and persons storing digital blockchain record content must be provided special online intermediary exemptions from liability after considering the specifics of the immutability principle. Current law, requiring deletion or blocking access to relevant content as a necessary condition of application of the exemption, needs to be tweaked to reflect the realities of blockchain functioning by minimising the rigidity.
- ***Need for records in the blockchain system to be given a strengthened legal status*** – Blockchain-based copyright management system should not merely exist as a source of information about copyright ownership, but should also create a strong presumption of authorship possibly via an amendment to the Copyright Act, that could only be rebutted by a decision of the court or a specialized ADR body. Potential disputes concerning ownership initiated by such

authorities and related information must be made available on Blockchain itself as it helps deepen transparency.

VIII. CONCLUSION

It is undeniably clear that the music industry and the community is seeking solutions to persistent problems lingering around the data management, financial and digital rights management issues and blockchain can be a very viable low-cost solution that has definitive potential. Blockchain, as an institutional technology holds promising answers to give the deserving right-holders elevated control over their creations by limiting the unnecessary interference of the middlemen by performing automated licensing and enforcement functions. Applicability of blockchain transcends jurisdictional barriers by countering the absurdity of the variance present in prevailing set of laws in the domestic legal systems. Smart contracts are a feasible option as the once entered particulars of the information cannot be tampered or edited beyond the facets of their code. Like all solutions, the introduction of blockchain-based systems does come with their drawbacks, the pertinent ones being data integrity and information verification, the monitoring of which might require intermediary presence that the system itself intends to avoid. To solve this, the chasm between the legal system of rights management and blockchain's technical system must be gauged. Though the answers to premeditated issues on the practicality of this system remain unclear, the upsides to the certainty the technology provides can't be refuted. Progressive steps must be taken prior to answering the possibly arising questions as taking the step is vital to potentially extinguishing existing barriers and exploring capabilities of the overall development in the arena of technological rights management.