

What are the benefits, if any, of blockchain technology within the entertainment industry?

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1. Introduction to blockchain technology

“Our problem has never been not having a tamper-proof place to store that data, it has been one of data management.” (Douglas, 2022)

Blockchains are decentralised and distributed digital ledgers networked on multiple computers, meaning it is not controlled or stored in one company or location.

For example, one must create a hash to store data required on a blockchain. This mathematical function takes a string of input characters and automatically generates a fixed-length output character string. The hashing function protocol used most is known as SHA-256. This protocol converts any number of characters as an input and generates an output as a 64-character value. The combination of the data required to be stored and the hash creates the ‘block’ portion of a blockchain. The hash is the essential piece of the blockchain, making the data tamperproof.

A different hash value gets generated if just one character in the data is changed. These ‘blocks’ are linked into ‘chains’ by adding the new block to the previously written block. The hash value from the previous block is encoded in the new data being hashed, which is how any attempt to alter the sequence of blocks or change the data within them is immediately ascertained by recalculating and verifying the hash.

This process is the cryptographic part of blockchains that results in no entry being able to be modified once published under the standard blockchain network functioning protocol.

The blockchain concept was integrated with numerous other technologies in 2008 to create cryptocurrencies protected by cryptographic processes rather than a central repository or authority. Most commonly, implementing Blockchains is used for a specific goal or function. i.e., Cryptocurrencies, smart contracts, and distributed ledger systems. Bitcoin was the first blockchain-based cryptocurrency; it gained its name due to the extensive use of cryptographic functions involved in its creation. This system forced users to share data publicly, enabling independent verification of the transaction’s validity and, therefore, ownership of the cryptocurrency itself.

Only two types of cryptographic keys are used solely to encrypt, decrypt, and sign the authenticity of data or verify a signature. Individuals can use public or private keys to sign and securely transact within the system. Encryption keys have two types: symmetric and asymmetric. Keys for the encryption and decryption are the same in a symmetric algorithm, but an asymmetric algorithm will have two keys: the (public) encryption key and the (private) decryption key.

2. Blockchain without cryptocurrency

It is helpful to consider what a blockchain is without cryptocurrency.

Blockchains without cryptocurrency can facilitate a permanent, public, and transparent ledger system. Used to collect sales data, track digital usage, and pay content creators like musicians and artists for nonfungible tokens (NFTs), supply chain initiatives, and the Metaverse. The database can include the history of cryptocurrency transactions, sales figures in a specific territory over a nominated period or confidential voting data related to elections, for example, that cannot change or get deleted once added. Although Bitcoin is the most known blockchain application, there many uses of blockchain technology. For instance, various blockchain technology implementations in financial services within the entertainment industry, including remittances, digital assets, and online payments. It enables payments to be made without other intermediaries/companies processing or profiting from the transfer.

Furthermore, the most promising blockchain technology applications within the next generation of internet interaction systems are, without a doubt, public services, the Internet of Things (IoT), reputation systems, smart contracts, and security services.

Ideally, blockchain technology could replace entertainment business models that depend on intermediaries for 'trust' systems. For example, NFTs were initially introduced on the Ethereum cryptocurrency network in 2017. They are one of the disruptive entertainment innovations based on blockchain, beyond cryptocurrencies, that influence intellectual property.

3. Intellectual Property rights

Regarding Intellectual Property, there are various potential hurdles to large-scale legal applications, including the laws and governing jurisdictions and data privacy issues.

Regardless, within the entertainment industry, with such high use of IP rights, blockchain technology offers multiple possibilities for IP registration and enforcement, providing evidence either during registration or in any later litigation proceedings. It also demonstrates an apparent faster and cheaper approach.

Potential use cases include authentication of evidence for creatorship and provenance, IP rights clearing and registering, tracking, and controlling the distribution of unregistered IP, detailing evidence of first and genuine use in trade and commerce, digital rights management (e.g., online DSP's), establishing and enforcing pre-existing IP agreements and licenses, with smart contracts, and conducting payments in real-time to IP owners.

Blockchain may also detect or retrieve counterfeit or stolen works for authentication and provenance purposes.

Blockchain technology's uses for managing IP rights are vast if considering recording IP rights in a distributed ledger as opposed to a traditional database; effectively, this creates "smart IP rights". It is related to the principle of IP offices becoming distributed ledger registries, in the form of a centralised but global solution run by IP offices worldwide as an official authority which would create an accountable, indisputable history of the registered IP right. Detailing when copyright was first applied for, registered, and used. It could also assist in resolving some of the practicalities involved with collating, storing, and providing such evidence. Tracking the entire life cycle of a right would be hugely beneficial and create smoother, faster IP right audits, as well as simplify the exercises of due diligence necessary for IP transactions within mergers and acquisitions. An opt-in scheme would address IP owners with concerns about confidentiality.

Content creators and owners would benefit from a ledger that details complete ownership information. It would provide a reference point for their rights and the extent to which those rights are being utilised—creating a highly advantageous position in jurisdictions where proof of genuine or first use is required or where the extent of service is crucial, such

as in disputes involving the recognition of well-known marks or defending the action of a non-use revocation. For instance, the details held on an official blockchain trademark register would inform IP owners and relevant offices with almost immediate notice.

Uploading original content to a blockchain with the details of its creators or designers would provide irrefutable time and date-stamped evidence detailing the use and frequency of registered IP in trade. Both are required to prove genuine and first use, secondary meaning/acquired distinctiveness, or goodwill of a trademark.

Also worth bearing in mind is that distributed ledger technology can publish technologies as prior art for defensive publication to nullify any attempts to obtain a patent over such existing technologies.

Blockchain technology can also play an essential role in the evidence of creatorship with unregistered IP such as copyright, which in numerous jurisdictions are not registrable as IP rights. For these unregistered design rights, it provides proof of their conception.

Qualification requirements, such as originality and the country in which articles made to the design were first publicly marketed, used, and status, is detailed in the Berne Convention for the Protection of Literary and Artistic Works (Article 15(1) of the Paris Act, 1971).

4. Smart Contracts

Often mentioned in the entertainment industry is the notion of “smart contracts.” As blockchain solutions can hold, monitor, and execute contractual codes, such “smart contract performance” are incredibly beneficial for the entertainment industry for digital rights management, royalty payments and other IP transactions.

Establishing and enforcing IP agreements in Smart contracts as licenses and allowing the instruction of payments in real-time to IP owners; “smart information” about protected IP rights - a song, film, or an image, for example - would be encoded in digital metadata within the file. These ideas are fast becoming mainstream, evidenced by Kodak’s launch of a blockchain-based image rights management platform and cryptocurrency (Kodak, 2018).

A ledger that shows the owner, authorised licensee, and distributor, would enable everyone in the supply chain, including consumers, government departments, and royalty collection societies, to validate and distinguish a genuine product from an unlicensed or counterfeit source limiting counterfeiting and enforcing IP rights. IP rights data on Blockchain ledgers facilitate provenance authentication since they record immutable details about the creation of when and where music, film or art compositions and details about the individuals involved. Adding scannable blockchain-connected QR codes, tamperproof seals or imprints to products is another use of distributed ledger technology that could play an essential role in fighting counterfeits.

Suppose a content owner informs regulators or DSPs about the security features that its products have. In that case, the absence of such qualities is an easy way for officials to check whether a product is unofficial or counterfeit. These features, alongside the blockchain, offer significant opportunities to engage and educate consumers about counterfeiting risks and the ability to verify the authenticity of the products independently.

5. Public and private blockchains

Only public blockchain needs cryptocurrency to function, and private blockchains do not. There are only two main categories of blockchains, public and private. Public blockchains are permissionless, allowing anyone to join the network and participate in the blockchain. Private blockchains lack decentralisation and are invitation-only networks run by a single organisation.

Permissionless blockchains, like Bitcoin, provide network participants, known as ‘miners’, rewards for solving a highly complex mathematical puzzle. The network token incentive is the motivator for the system as a whole and a means of achieving consensus. Since participants involved in Bitcoin mining get incentivised, hundreds of thousands of computers engage in it. By removing the rewards, the motivation to participate and run a node in the mechanism decreases, which raises the risk of attempted heists.

Hyperledger is an excellent example of a private blockchain. The blockchain-based distributed ledger, created by the Linux Foundation, is mainly used to support confidential commercial transactions (Hyperledger Foundation, 2016).

6. Oracles

Smart contracts without Blockchain technology would cease to function as it enables automated agreements to be conducted and facilitated without the involvement of a third party. Like smart contracts, database systems can have self-executing components such as stored procedures and triggers. But yet, they cannot enforce immutability because administrators can manipulate any and every transaction, purge transaction logs, and appear to have never been manipulated. As a result, blockchain use is fundamental with smart contracts that require safety and tamperproof security.

Although, Bitcoin does not yet support highly complex smart contracts. Without blockchain, no other technology would enable the mainstream use of smart contracts. Nonetheless, smart contracts require blockchain oracles to input off-chain data that links to the distributed ledger at predetermined times.

Oracles provide a solution to access off-chain resources. Still, doing so requires both parties to enter into an agreement or contract, which undermines the decentralised advantages of smart contracts (Mastando, 2022).

If an oracle encounters defects in a system and cannot distribute the necessary information, the process leads to potential errors, delivers inaccurate data, or completely quits the operation. Therefore, smart contracts must address these problems before mainstream adaptation ensues.

One of the most demanding challenges faced by blockchain networks and smart contracts is their reliance on hand programming; therefore, there will always be a potential for exploits by human error. In 2016 this happened to Ethereum's Decentralised Autonomous Organization (DAO), where a vulnerability in the DAO's smart contract was hacked and used to extract money from the project (Cryptopedia, 2022), as well as the complete lack of regulatory clarity with autonomous agreements.

While the idea of a secure, streamlined money transfer process is excellent, there is still taxation and other government involvement to consider. Users may want complete control over all data, but where does that leave governmental regulators to get what they need? Smart contracts in their current state cannot pull information outside the network in which they exist. Although, there is a workaround in oracles, which are entities that connect blockchains to external systems allowing smart contracts to execute depending on real-world inputs and outputs. Oracles provide the Web 3.0 ecosystem with a solution to connecting to existing data sources, legacy systems, and advanced calculations.

Decentralised Oracle Networks (DONs) facilitate the implementation of hybrid smart contracts, where on-chain code and off-chain infrastructure are linked to enable Decentralised Applications (DApps). These DApps react to real-world events and interact with traditional systems that insert all the required information to make them compatible with blockchain networks. As databases move to the blockchain, oracles could facilitate that requirement. Additionally, there is a long-standing issue with scalability. Since its beginnings, blockchain networks have struggled at scale. Based on user activity, transactions could take minutes to hours, but this is still somewhat faster than the standard timescales of international money transfers (Geroni, 2021).

7. The future of the entertainment industry

The future of smart requirements-powered contracts is undoubtedly the way forward for relatively basic entertainment industry contracts. The type that can be written and executed at predetermined times or whenever pre-conditions are met. Such as in purchasing NFTs or downloading multimedia content, when, upon completion, funds are released when contracts are signed. The transfer of content is then released.

As a result, utilising various smart contract platforms will save entertainment businesses time and money while also revolutionising how they engage in the supply chain and with their customers.

The entertainment industry has witnessed a divisive profit distribution model for many years. Traditionally, creators receive low percentages for the revenue of their work, primarily due to the range of intermediaries involved in publishing, marketing, and distributing the material. However, this situation has changed since blockchain networks cut out the intervention of third parties. The technology ensures streamlined and accurate royalty payments, usually a higher percentage than traditional contracts, and secondary sale royalties, which rarely happened previously. Those wanting the services or content need to pay in advance.

Creators get paid every time their music gets played, film watched or resold, instead of being missed due to identification issues, estimated around 25% (Christman, 2015).

Centralised entertainment is considered a lose-lose situation. Creators lose large sums of profit; customers also pay additional fees for the intermediaries. A decentralised blockchain offers a potential utilisation of micropayments. Users make online transactions for small services or items they desire to use or own.

The entertainment industry and advertising industries are co-dependent. With blockchain's support, participants, such as advertisers and agencies, in tracking and attributing immutable advertising-related metrics. Since data in the chain is firm, the metrics are reliable, affordable, and real-time. Information history is copied to each participant node, making it secure against exploitation.

8. Conclusion

Blockchain is a more general idea of Distributed Ledger Technology. The problem begins with removing the counterparty to verify the data added to a blockchain, as the cryptographies do not detail the veracity; it just has yet to be changed. A publicly accessible platform where anyone can make undeletable assertions about their ownership or contribution to content creation is heavily flawed. So, it cannot be public as it must be 'permissioned'. It effectively creates new intermediaries of control, determining who can and cannot add data – in a very similar vein to the Collective Management Organisations, which are currently withstanding and functioning quite adequately.

While there are many clear advantages to Blockchain technology usage within the entertainment industry, the lack of regulation, implementation, and compatibility, must be addressed before being widely adopted, or it will remain, at best, a gimmick and a distraction.

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