

Blockchain and Non-Fungible Tokens: How they are set to advance the world of Intellectual Property Rights

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ABSTRACT

In this research paper, we explore what Non-Fungible Tokens are and how they are on the path to advancing the world of intellectual property rights, to the extent that refusal to adapt would slow down the progress of technological, artistic as well as innovative expansion. This research paper seeks to explain how, in this post-modern era of the genzinic Pandora's box, the digital universe of blockchain technology is set to transform the world of Intellectual property rights, its creation, protection and enforcement.

Keywords: Non-Fungible Tokens, intellectual property rights, digital, blockchain technology.

Subject: Technology

INTRODUCTION

Just like necessity is the mother of invention, change is the mother of evolution. Whether we talk about the transformation from apes to *homo sapiens* or animal skins to ripped jeans, humanity has invested considerable time and resources trying to understand its nature. For example; the metal shortages of World War I encouraged the end of the corset and led to the widespread rage known as the bra patent for which was granted in 1914 to Mary Phelps Jacobs (Google Patents, 2022).

Similarly, the physical restrictions of the covid crisis forced the world onto our screens. Whether it be work, school, social life or even ordering food, there was nothing that technology did not allow us to delve into from the safety of our homes. Necessities, luxuries and everything in between were shifted into the digital world. This crisis, although caused heavy losses to human life and society, also led to the acceleration of the growth of the digital world (National Library of Medicine, 2022). Change forced living species to adapt, innovate and evolve. Now, as the world moves forward, the virtual revolution is steadily seeping into all of our daily lives, offering ease and accessibility, connecting the world, one IP address at a time. The newest development is Blockchains and Non-fungible Tokens and how they will lead to an evolution in the way we evaluate, protect and monetize our intangible assets.

Intellectual property has always existed in one form or the other, whether it's an artist's name at the bottom of their painting or the trade secrets we call family recipes (Naja, 2020). The evolution of Intellectual Property is not only a subject of legal concern but also a stepping stone in making sure artists, creators, innovators etc. receive their due share. It is not only the motivation and security for the harbingers of change, innovation and beauty in our world but it also empowers them to earn their rightful share of livelihood and a respectable place in society.

WHAT IS BLOCKCHAIN & HOW DOES IT WORK?

Blockchain is a system of recording information in a way that makes it impossible to change, hack, or cheat. (Rodeck & Curry, 2022). A blockchain is a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems (Euromoney Learning, 2022). Each block in the chain contains multiple transactions, and for each new transaction on the blockchain, a record is added to every participant's ledger. The decentralized database managed by multiple participants is known as Distributed Ledger Technology (DLT). Blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash.

FEATURES OF THE BLOCKCHAIN

- i. **Immutability** - Any information stored within the blockchain cannot be edited or deleted. To change any data, each block and ledger must be changed. As a result, if one block in one chain was changed, it would be immediately apparent it had been tampered with and would not hold the same value or credibility anymore.
- ii. **Decentralized** - No one governing body can make any change to the network. The integrity of the blockchain is maintained by anonymous users across the network who validate transactions without third parties. Users can simultaneously maintain their assets themselves, promoting transparency.
- iii. **Programmable** - Functions of the blockchain are programmable through smart contracts which are a digital parallel of traditional contracts. Smart contracts can also digitize agreements by turning an agreement into code that automatically executes when the contract intends; without the need for trust or third parties.
- iv. **Anonymity & Privacy** - All transactions are tied publicly to a unique cryptographic address and not an individual/group's identity. Each user has a public and private key. Keys are random strings of numbers and it is nigh impossible to guess a private key from a public key. Each user has an address that is derived from the public key using a hash function and is used to perform transactions. A public address can be regenerated to avoid tracing.
- v. **Quick Response** - Any change in the ledger is updated in minutes, alerting all owners of every public ledger. Blockchain also offers faster settlements due to the lack of intermediaries.

TYPES OF BLOCKCHAINS (Guide & Jha, 2022)

1. **Public** - It is a non-restrictive form of the ledger in which each peer has a copy. This also means that anyone with an internet connection can access the public Blockchain. This user has access to historical and contemporary records and the ability to perform mining operations. On the blockchain network, no valid record or transaction may be altered. Because the source code is usually open, anybody can check the transactions, uncover problems, and suggest fixes.

Advantages of Public Blockchain -

- **Trustable:** Public Blockchain nodes do not need to know or trust each other because the proof-of-work procedure ensures no fraudulent transactions.
- **Secure:** A public network can have as many participants or nodes as it wants, making it a secure network. The higher the network's size, the more records are distributed, and the more difficult it is for hackers to hack the entire network.
- **Open and Transparent:** The data on a public blockchain is transparent to all member nodes. Every authorized node has a copy of the blockchain records or digital ledger.

Disadvantages of Public Blockchain -

- **Lower TPS:** The number of transactions per second in a public blockchain is extremely low. This is because it is a large network with many nodes which take time to verify a transaction and do proof-of-work.
- **Scalability Issues:** Its transactions are processed and completed slowly. This harms scalability. Because the more we try to expand the network's size, the slower it will become.
- **High Energy Consumption:** The proof-of-work device is expensive and requires lots of energy. Technology will undoubtedly need to develop energy-efficient consensus methods.

2. **Private** - A blockchain network operates in a private context, such as a restricted network, or is controlled by a single identity. While it has a similar peer-to-peer connection and decentralization to a public blockchain network, this Blockchain is often run on a small network within a firm or organization rather than open to anybody.

Advantages of Private Blockchain -

- **Speed:** Private Blockchain transactions are faster. This is because a private network has a smaller number

of nodes, which shortens the time it takes to verify a transaction.

- Scalability: You can tailor the size of your private Blockchain to meet your specific requirements. This makes private blockchains particularly scalable since they allow companies to easily raise or decrease their network size.

Disadvantages of Private Blockchain -

- Trust Building: In a private network, there are fewer participants than in a private network.
 - Lower Security: A private blockchain network has fewer nodes or members, so it is more vulnerable to a security compromise.
 - Centralization: Private blockchains are limited in that they require a central Identity and Access Management (IAM) system to function. This system provides full administrative and monitoring capabilities.
3. **Hybrid** - Organizations who expect the best of both worlds use a hybrid blockchain, which combines the features of both private and public blockchains. It enables enterprises to construct a private, permission-based system alongside a public, permissionless system, allowing them to choose who has access to certain Blockchain data and what data is made public. In a hybrid blockchain, transactions and records are typically not made public, but they can be validated if necessary by granting access via a smart contract.

Advantages of Hybrid Blockchain -

- Secure: Hybrid Blockchain operates within a closed environment, preventing outside hackers from launching a 51 percent attack on the network.
- Cost-Effective: It also safeguards privacy while allowing third-party contact. Transactions are inexpensive and quick and scale better than a public blockchain network.

Disadvantages of Hybrid Blockchain -

- Lack of Transparency: Because information can be hidden, this type of blockchain isn't completely transparent.
- Less Incentive: Upgrading can be difficult, and users have no incentive to participate or contribute to the network.

WHAT ARE NFTs?

Non-fungible tokens (NFTs) are a new category of unique tokens used for certifying ownership of digital assets. Information about NFTs stay on a blockchain or a shared ledger, under maintenance by thousands of computers worldwide. NFTs validate the originality, sale and ownership of every piece of art or information stored asan NFT (Howell, 2022).

While digital art constitutes the biggest chunk of the NFT market, the nature of the technology allows for near-limitless experimentation in what an NFT can represent (Golitsin, 2021). Movies, concerts, tickets, sports events, and education, are just a few growing NFT categories benefiting from blockchain-based proof of ownership and authenticity. Blockchains are publicly accessible and immutable digital ledgers, one can view the entire transfer history of a specific NFT. We can see who created an NFT, who purchased it, who held it for how long, and the value at which the transaction occurred. This makes things very transparent in terms of ownership (Hayes, 2022).

The increasing popularity of NFTs stems from the recent “normalisation of cryptocurrency, combined with advances in blockchain technology.It is further accentuated due to a sense of consumer FOMO and an evolving understanding of how ownership works on the open internet” Stenberg, 2021). An NFT works by creating a file on a blockchain where the digital work cannot be “copied and pasted, edited, or deleted (Hayes 2022).

While buying an NFT allows the consumer to gain ownership over the work, it does not, however, stop the work from being viewed, downloaded, and shared across the Internet (Clark & Castro, 2022). NFTs and their blockchains will create a safe marketplace for the artist and the consumer by verifying the authenticity of the work through blockchain technology while allowing the consumer to gain ownership over the digital work as if it were a physical piece. Unlike physical works,

NFTs have the potential to allow the buyer to directly support the artist (Conti & Schmidt, 2022). This in turn could allow the art world to become more profitable with the artist gaining full monetary value for his or her work.

INTELLECTUAL PROPERTY RIGHTS

- (i) Copyright - The rights of authors/performers of literary/artistic works are protected by copyright.
- (ii) Industrial property - trademarks and geographical indications
- (iii) Patents - industrial designs, trade secrets and inventions.
- (iv) Industrial Designs -An industrial design constitutes the ornamental or aesthetic aspect of an article
- (v) Geographical indicators - indications of origin are signs used on goods that have a specific geographical origin and possess qualities, a reputation or characteristics that are essentially attributable to that place of origin.
- (vi) Trade secrets- IP rights on confidential information which may be sold or licensed.

Advantages Of Intellectual Property Protection Registration

- i. Intellectual Property Status - Intangible property is strengthened by the granting of government-recognized asset status. This allows your IP to be recognized as an asset.
- ii. Evaluation - The process of Intellectual property registration is preceded by the evaluation of the worth of your intellectual assets. This allows you to have a real and apt description of how valuable this asset is to the individual/party in terms other than just demand.
- iii. Certification that Allows Enforcement - Registration of intellectual property provides the certification required to establish the right to ownership over intellectual assets. It serves as legally valid proof of value and possession.
- iv. Marketing - You can easily market your business's products and services if you have patent or trademark protection over your intellectual property. This can include the design of your product or logo. It can help differentiate a business from others to draw in potential consumers.
- v. Licensing agreements/or the sale of your invention - If you sell your business, it will be worth more if you have intellectual property protection.

Disadvantages Of Intellectual Property Protection

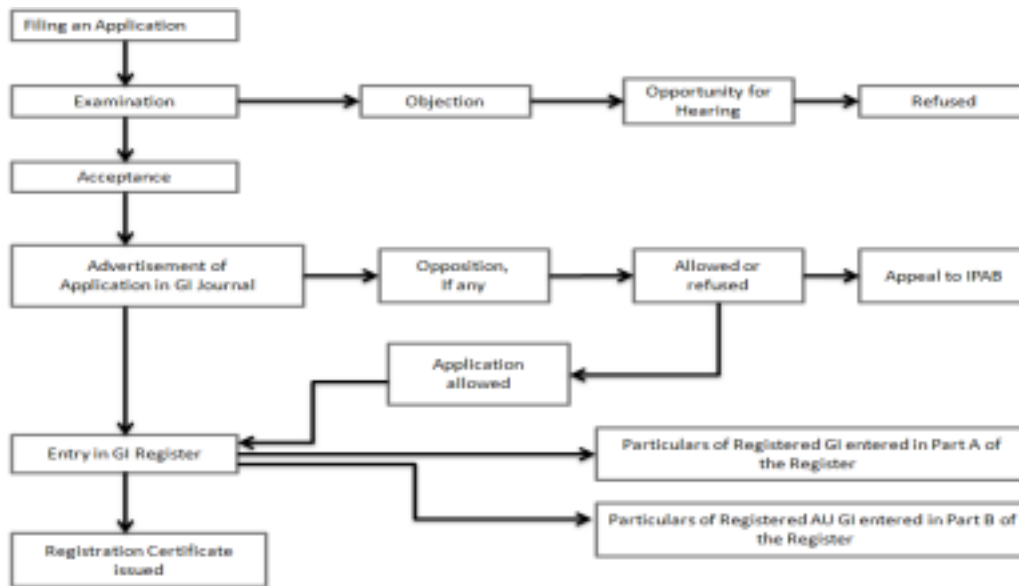
- i. Financing - Protecting your intellectual property costs a lot of money, particularly if you have a very complex product that involves designs, methods, and processes.
- ii. Enforcement - Includes further consumption of time and funds and may not always be fruitful, making the entire process stressful and wasteful.

How Nfts Will Change The Way We Create, Protectand Enforce Intellectual Property

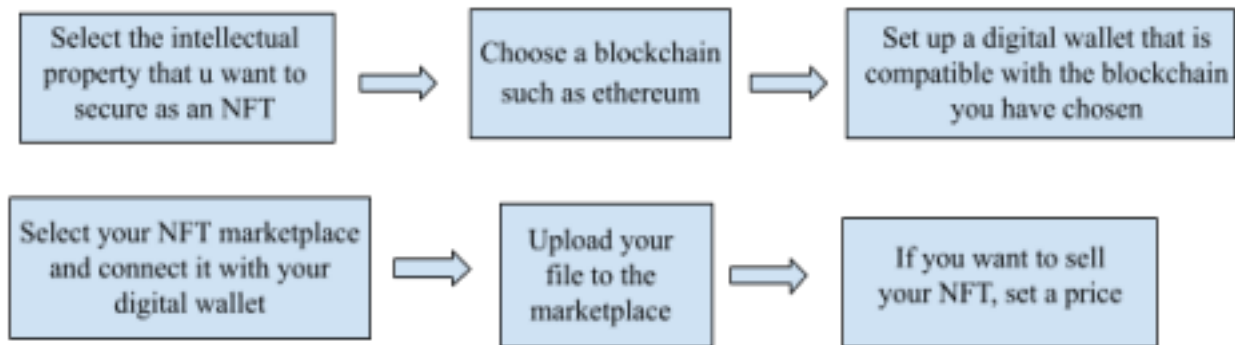
Intellectual property refers to intangible forms of property which can be owned, sold, bought, transferred, inherited etc. just like any physically tangible property. It lends value and credibility to imaginative and creative work whether in the form of art, science or even trade secrets, thereby promoting and protecting artists, creators, inventors and innovators. NFTs are a more secure form of IP protection - a platform for intellectual property that can be protected by both the blockchain and the law(Guadamuz, 2021). However, NFTs cannot completely replace the importance of the IP fraternity yet.

Nfts V/S Intellectual Property Registration: A Reality Check

An example of the process for registering intellectual property:



An example of the process of creating a non-fungible token (Wade, 2022):
 Pictorially translated by the author of this research paper.



How NFTs Have Bettered The Field Of Intellectual Property?

Presently, in the digital age, art and invention are no longer restricted to physical form. With progress in technology, it is possible to fashion everything like music, design and art digitally. The ease of protection and monetization that NFTs have provided allows one to protect and benefit directly from their intellectual property. Thus, it has allowed expansion and growth in this industry to keep up with the coming trends and regulate their negative effects while benefiting from their strengths.

How Nfts Can Secure And Automate Intellectual Property?

As mentioned above, (refer to “features of the blockchain”) NFT’s affiliation with the blockchain means that it is a secure avenue for the protection of intellectual property, as an added layer of encryption for registered assets. It allows secure storage, controlled access and defences against threats such as hacking or digital theft. It ensures anonymity, withholding private information without running the risk of attracting malicious attention from unfriendly parties and the general public. (Borky&Bradley, 2018).

The smart contract feature allows one to program terms and conditions. This is helpful in cutting out third parties and collections of royalties or transfer of ownership in the form of any “if this then that”. The applications of smart contracts are numerous and they allow ease of monetisation. One can also easily buy and sell intellectual property digitally. Having your asset saved as an NFT also allows you to have your asset listed for sale digitally either with the actual intention of selling or just to gather insights on the public demand/ value of your creation (Zoltu, 2022).

Drawbacks Of Nfts

1. **Need for laws against real to digital IP fraud** - While the integrity of a blockchain is unquestionable, NFTs can be

used to perpetrate fraud. Several artists have recently reported discovering their work for sale as NFTs on online marketplaces — without their consent. This violates the intent of utilizing NFTs to facilitate the sale of art. The value proposition of an NFT is that it authenticates a physical work of art with a unique token, assuring the person who owns the token that they also own the original work of art. A serious problem arises if someone creates an electronic image of the original work, attaches a token to it, and puts it up for sale on a virtual marketplace. Here, there is no link to the original work. The token is linked to a fraudulent reproduction and currently, no specific laws have been put in place for the protection of physical artwork being translated into an NFT except those protecting intellectual property in general. The inclusion of NFT technology into the intellectual property legality umbrella will also help enforce and generate awareness against such crimes.

2. **Environmental Harm** - It takes a significant amount of computing energy to create blockchain records, and there's a growing debate about the long-term harm the process is causing the environment. By some estimates, at the current rate, the carbon emissions from mining cryptocurrencies and NFTs will exceed those associated with the entire city of London in the coming years. Blockchain enthusiasts argue that an offsetting reduction in pollution is underway as NFTs transform global marketplaces, reducing the need for travel and space utilization.

3. **The disparity between copyright and NFT** - When you purchase non-fungibles, you're not necessarily purchasing the copyright to the art. People are still able to find copies on the Internet of the art for which you own the token, and nothing is stopping them from copying and pasting these files on social media, essentially showing off and sharing what you may have paid millions of dollars for. While collectors still retain the value of ownership of their NFTs this causes questions as they would fall in the grey area of IP ownership, differentiating control and rights thus making monetisation and enforcement of certain assets difficult. This is another reason why Intellectual property must be redefined to include NFTs. Such a step is also essential to curb unauthorized use or profit from copyright infringement. Laws in these regards are essential to protect Intellectual property owners and lend clarity to such forward and questionable concepts.

Need For Broadening Of the Ipr Fraternity

The IPR fraternity must welcome and adopt this new technology for multiple reasons. Our existing laws must evolve to carry space for this beautiful addition to IP security and adequate training and awareness must be generated among related professionals such as lawyers and advisors of all creative/ innovative fields. The hesitation around that which is new can only be diluted through awareness and education. The benefits of advancement can only be enjoyed when they are accessible and this accessibility can only be provided by the marriage of intellectual property management institutions with the NFT technology.

The benefits of this union will lead to a new improved form of encryption of IP which will also allow the widespread propagation of faith in Intellectual property registration by reducing costs of protection against unauthorized usage, allowing monetisation as well as increasing the capability of enforcement of rights. This advancement will also support a surge in imaginative and evolutionary innovation across all fields leading to accelerated change and development around the world. The accessibility to better facilities will allow an increase in the quality and quantity of change that ushers around us through creative minds.

CONCLUSION

The changing times and the sudden popularity of the blockchain majorly within modern mass media as NFTs and finance as Cryptocurrency along with its various applications in the fields of healthcare, governance, law, logistics, commerce etc, are undeniable (Daley, 2022). Although there exists immense literature and research on this domain and its possible uses, there exists very few research that appropriately compile all the basic and essential information required to understand how this technology works as well as an insight into its legal identity, with the perspective of a layman's understanding.

This article serves as an introduction to the basics of this technology as well as Non-Fungible Tokens whilst exploring the implications of the blockchain on the legal field of intellectual property rights with reference to its implications on stakeholders such as creators, collectors, patrons, buyers etc. Additionally, it also expands on how and why the blockchain as a concept was created and gained such popularity as well as its inter-relation with Intellectual Property. It also explores how blockchains work, their advantages, disadvantages, types as well as their resulting technological by-products such as smart contracts and NFTs. It further elaborates upon how and why NFT's are created and their contribution to the existing field of art, literature etc. In order to create a better understanding for people who may not be familiar with the field of IPR, this paper summarises what Intellectual property is, its types, importance and the procedure for its legal identity to be established.

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