



AN IN-DEPTH STUDY ON THE INCREASING USE OF BLOCK CHAIN TECHNOLOGY AND ARTIFICIAL INTELLIGENCE IN NON-FUNGIBLE TOKENS (NFTS) AND DIGITAL ART: ARE THESE THE NEW SPACE FOR EMERGING UNICORNS?

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ABSTRACT

This paper analyzed the increasing use of Blockchain Technology in the ownership of Non-Fungible Tokens (NFT) and Digital Art. It brings into perspective the advantages of Blockchain and Artificial Intelligence (AI) in the realm of collectibles, like art, music, and virtual reality. As they are NFTs, they can neither be traded nor exchanged, unlike cryptocurrencies. This opens up opportunities for new-age companies like OpenSea and Magic Eden amongst others who have achieved the status of Unicorns. An attempt was made to understand the process through which such status was achieved.

KEYWORDS : NFT, Blockchain, Cryptocurrency, Opensea, Metaverse, Digital Art, Unicorns.

1) INTRODUCTION

Since Nakamoto published 'Bitcoin', the development of the cryptocurrency has been moving up and down, but its underlying blockchain technology has received more attention in recent years. It is the blockchain technology which has been the major development in the world. It is regarded by some as the most revolutionary technological innovation since the dawn of the internet. Its application of this technology along with AI has resulted in important breakthroughs for independent innovation of core technologies. The most visible use of blockchain technology is the rapid development of cryptocurrencies, Bitcoin futures, ETF (Exchange Traded Funds), NFT, etc. With the widespread use of this new form in every sphere of our daily lives, it is extremely important to understand the meaning, its working and the impact that it has on the world.

2) Definition

To realise the synergy between Blockchain, AI, and NFT, it is important to understand the role of technology in each one of them.

2.1 Blockchain

The blockchain system is now democratizing and transforming all kinds of industries, from healthcare to trade finance. A blockchain is a distributed database where transactions are organized in blocks. Each block has a timestamp and an association with a previous block, forming the so-called blockchain. Using a distributed ledger and cryptology, the technology ensures that everyone's copy of the ledger is kept synchronized and unique. While information can be added it cannot be deleted. The main idea behind the technology is the security and independence of data. Besides this, a transaction based on blockchain can take place at the speed of light, connecting places distanced by a thousand miles in only a fraction of a second.



Figure 1: Picturisation of Blockchain Technology  
Source: pinterest.com

It is a decentralized, distributed, and public digital ledger that is used to record transactions across many computers, so that

the record cannot be altered retroactively without the alteration of all subsequent blocks as well as the consensus of the network.

The principles of blockchain technology:

- Peer-to-peer network means that this technology works on peer-to-peer interaction, the interested parties directly interact with each other via a blockchain platform.
- No third party- There is no third-party investment. This means that when two parties directly connect without depending on a third party for validation and verification, it becomes easier for the buyer and seller to interact and execute transactions without any delay.
- Time-stamping- Any information that gets an entry in the Distributed Ledger Technology (DLT) is time-stamped. It becomes easier to track and trace data or information. Each piece of information is stored as a block, and one block is connected with others in a sequence, any removal of the block will become visible to the people in the network. This aids in finding out if there has been any data alteration.
- Decentralisation- Information is spread across the network, rather than it being stored centrally. This helps in tracking and tracing information, which makes it easy for both companies and individuals.
- Cost-effective solution there are no intermediaries, which leads to reduction in time delays as well as lowers costs.

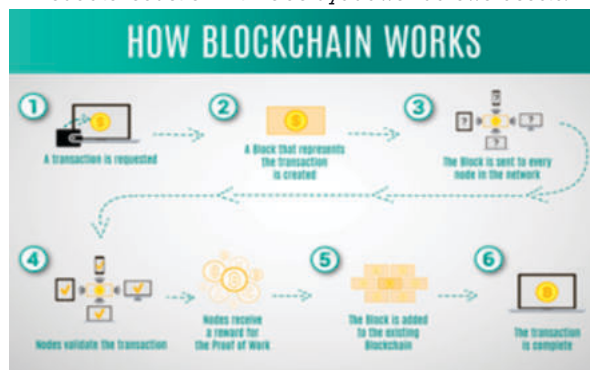


Figure 2: Working of the Blockchain Technology  
Source: upgrad.com

Blockchain technology is revolutionizing payments, as it enables secure and transparent transactions without the use of third-party intermediaries, reducing transaction fees and time delays. Instead of relying on centralized servers, blockchain-based platforms allow participants to directly exchange data while maintaining control over their privacy and security.

The first generation of Blockchain was meant to improve the traditional money system. Bitcoin and other cryptocurrencies

were introduced during this phase. It used the PoW( Proof of Work), consensus model. Originally the technology was primarily used for cryptocurrency alone, but subsequently, developers realized the immense scope this technology has beyond just cryptocurrency.

From the advent of 'Bitcoins', the market moved to 'Smart Contracts'. This paved the way for using the platform to make agreements more automated, secure, and effective.

From the above, the advancement of technology led to the most efficient solutions, concerning the impact it has on the economy. Besides, Decentralized Ledger Technology, IOTA (an open-source distributed ledger and cryptocurrency designed for the Internet of Things). It uses a directed acyclic graph to store transactions on its ledger, motivated, by a potentially higher scalability over blockchain-based ledgers. IOTA does not use miners to validate transactions instead, nodes that issue a new transaction on the network must approve two previous transactions.



**Figure 3: IOTA is the backbone of the Internet of Things**  
Source:bitrates.com

## 2.2 NFT

NFT is a unique digital identifier that is recorded on a blockchain and is used to certify ownership and authenticity. It cannot be copied, substituted, or subdivided. The ownership of an NFT is recorded in the blockchain and can be transferred by the owner, allowing NFTs to be sold and traded. They can be created by anybody, and do not require many skills. They contain references to digital files such as artwork, photos, videos, and audio. As they are uniquely identifiable they differ from cryptocurrencies which are fungible. Proponents claim that NFTs provide a public certificate of authenticity or proof of ownership.

The first known "NFT", Quantum was created by Kevin McCoy and Anil Dash way back in May 2014. They are encoded within smart contracts on a blockchain. They suddenly burst into the market with them dominating the 'art market'. They were a novelty in the art world. NFT offers a unique digital certificate of ownership., offering indisputable answers to such questions as who owns, previously owned, as well as which among the copies is the original. Originally NFTs were part of the Ethereum blockchain but increasingly more blockchains have implemented their versions of NFTs.

The first popular example was the 'CryptoKitties', a collection of artistic images representing virtual cats that are used in a game on Ethereum that allows players to purchase, collect, breed, and sell them on the same platform. Ethereum is unique as it is censor-resistant, immutable, secure, transparent, and decentralized. The main feature of this platform is that the ledger of transactions is public while the transacting parties are anonymous. Developers can build, and deploy decentralized applications. It is a platform that establishes a peer-to-peer network that securely executes and verifies application code, called smart contracts. There is no centralized authority that oversees these contracts. This

platform changed from 'proof of work', to 'proof of stake'. 'Proof of Stake', relies on crypto staking, while proof of work relies on crypto mining. 'Proof of Work', is an algorithm that's designed to verify transactions and obtain new blocks added to the blockchain, while in 'Proof of Work', miners are competing to be the first to finish a mathematical puzzle that will generate a new block.

Proof-of-stake is a consensus algorithm that decides who validates the next block, which is based on the number of coins that one holds, instead of miners cracking cryptographic puzzles using computing power to verify transactions as they do in Proof-of-Work. The probability of validating a new block is determined by how large the stake of an individual is. The validator does not receive a block reward, instead, they collect network fees as their reward. There is no competition as the block creator is chosen by an algorithm based on user stake. Proof of Stake systems are much more cost and energy-efficient than Proof-of-Work, but are less proven.

## 2.3 Artificial Intelligence (AI)

AI can automate financial processes on the blockchain, such as invoicing and payment processing, eliminating the need for intermediaries and improving efficiency. It can also help track products on the blockchain and ensures authenticity and transparency, as all members of the network can see the same records.

The integration of AI enhances blockchain's scalability, speed, and adaptability. AI-driven predictive analytics can detect anomalies and fraud in real-time, bolstering blockchain security. Additionally, AI can address blockchain's energy consumption concerns by optimizing resource allocation.

As AI technology has advanced there is a synergy between AI and Blockchain technology. The digital transformation of AI is essential for business innovation strategies can rapidly and comprehensively read, understand, and correlate data at incredible speed, bringing a new level of intelligence to blockchain-based business networks.



**Figure 4: AI and Blockchain Synergy**  
Source: sharpcorner.com

## 3. Impacts and Use of NFTs

NFTs in recent times have become a booming technology, with a trading volume that has increased from \$150 million to over \$5 billion (recorded in January 2022 by considering transactions that took place on the Ethereum blockchain, Dune Analytics, 2022, <https://dune.xyz/rchen8/opensea>) through the main exchange platform OpenSea (Opensea.2022. *Opensea, the largest NFT marketplace*; <https://opensea.io/>).

Public attention towards NFTs has exploded since the beginning of 2021. It was at this time when the NFT market experienced record sales and exchange volumes. They have significantly empowered digital artists and creators by addressing one of the longstanding challenges of the digital age, that of proving ownership and authenticity. In recent

times individual pieces for some projects have reached a price of millions of dollars and have been purchased by several celebrities. NFTs and their technology are already being used in many varied fields. The economic use of this technology is in the; certification of digital generative artworks, the representation and management of land and object ownership in the metaverse, as well as the certification of ownership of a profile image in social networks such as Twitter. It is the use of profile picture images (PPFs) that has been one of the largest contributors to the popularity of NFT technology. The use of NFTs as profile pictures has both social and technological interest. NFTs allow artists to establish ownership of their digital creations and ensure that they are not duplicated or passed off as someone else's work.

The expansion of NFTs is intrinsically tied to the birth of COVID-19. When online ways became the norm, investors flocked to different cryptocurrency marketplaces. As the dependency on online transactions increased so did the expansion of NFTs.

The three primary fields of NFT study are:

- Computer Science
- Economics and Finance
- Law and other disciplines

#### 4. Are NFTs the 'New Emerging Branch of Blockchain Technology?'

NFTs are the newest application of Blockchain-enabled products. Both NFTs and tokens are a wider part of the creation of a metaverse- a new digital, online environment. The three examples of startups are:

- Metahero( registered in UAE, started by a Polish millionaire, Robert Gryn. It creates a 3D scanning and modeling technology that will generate realistic 3D avatars and virtual items in the form of NFTs. The token used is HERO)



Figure 5: Image of a METAHERO  
Source: Nigeriabitcoincommunity.com

- Utiarena (registered in Singapore. It is a community and NFT marketplace destined for gamers, artists, and developers. It has a ULTI Metaverse, which is a game engine that enables creators to make their games and share them with the community. The token used is called ULTI)
- Bloktopia(registered in the Isle of Man. It is a self decentralised metaverse'. It uses a 3D creation engine to create realistic visualizations and enhance user experience . Bloktopia token is a BLOK)



Figure 6: image of 'BLOK'  
Source: pikisuper.com

Vblockchain technology is based on a peer-to-peer network without central computers and transaction verification systems, using an encryption method called cryptography. Each computer connected to the network can participate in the transmission and authentication of transactions (Widawski et al., 2021). Due to the decentralization and dispersion of information, the data is not stored in one place but is shared and authorized by all users belonging to this blockchain. As the information is not owned by a single person the possibility of economic and political pressure does not arise. As the blocks of data are connected in chains, it is impossible to lose this information. There is no unauthorized access to this information, at the same it is open to everyone.

The user can view his entire transaction from the beginning. Blockchain as a concept has removed the services of middlemen, thereby increasing the value of existing products. Besides this, it safeguards the investor from the following:

- Securing the user against double payment. It is impossible to spend twice for the same purpose.
- It ensures consensus; groups of computers work together to reach an agreement. When 51% of consensus is reached, only then is a transaction recorded in a digital ledger.

There are 'cryptocurrency exchanges', Currency like 'bitcoin', or 'litecoin', are distinguished from digital tokens, eg 'Binance coin', and 'Cardano'. Cryptocurrency operates on its network, while the token is created on some other blockchain network using the 'smart contract'. There are many more tokens than cryptocurrencies which act strictly like money, while tokens can be used to raise funds for project development, reward network users, or take on features similar to shares.

NFTs can take various forms, but they always contain two characteristics which are:

- A text, image, audio, video, or other file for which the NFT certifies the originality.
- Always based on blockchain technology, guaranteeing its unique feature.
- NFTs exist as a cryptographic record on the blockchain
- The first NFT was created on the Ethereum platform.

NFT generation is primarily done by artists and other creators, however, it can also be created for a small fee by anyone who believes that they have something that has a unique value and it is worth affixing it with a certificate of originality.

#### 4.1 Metaverse

In 2020, this term appeared to describe the environment of computer games such as Fortnite, Roblox, and Minecraft. A very common phrase that is used today is 'Into the Metaverse'. There are four categories: Metalives, (confirming that one is transferring one's life activities to the virtual world e.g. virtual fashion) MetaSpaces,( creation of virtual spaces, where concerts, events, exhibitions, and fairs of intangible products will take place in this space) Metabusiness(these relate to the creation of virtual spaces) and MetaSocieties (This is a new advanced type of social media, in the form of avatars and hyper realistic digital characters that are created on Metahuman or Nvidia Omniverse.)

#### 4.2 OpenSea

This is a decentralized marketplace for NFTs. A marketplace that offers users the ability to buy, sell create, and trade NFTs. It is the largest trading platform, worth more than 2.4 million active users and a daily trade volume of \$6.03 million as of November 2022. Being a noncustodial platform, it allows users full control and access to their cryptocurrency wallets. Users interact directly with other users to buy or sell an NFT or a bundle of NFTs.It has amassed the world's largest share of NFTs for sale.

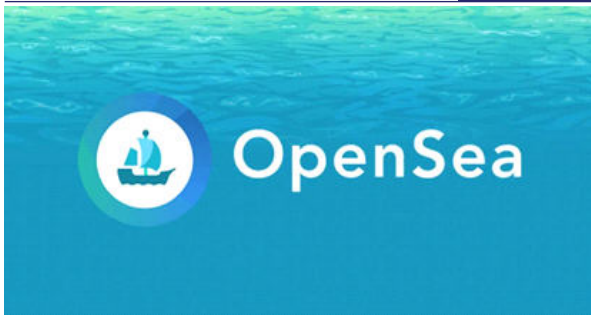


Figure 7: Symbol of 'OpenSea'  
Source: nftdesk.com

The main platform for OpenSea is Ethereum, it is not free from shortcomings, due to its poor scalability, as well as being notoriously expensive due to high gas fees. To avoid these disadvantages OpenSea has integrated with 'Polygon'. This allows Ethereum tokens, such as NFTs, a faster and cheaper way to transfer. Ethereum founder Vitalik Buterin has urged NFT projects to migrate their tokens to Polygon. This platform uses a wrapped version of ETH called WETH (wrapped ETH).



Figure 8: Polygon Logo with cryptocurrency with a themed circle.  
Source: shutterstock

This arena was the first and the largest NFT platform that provided essential NFT services. Before being created in 2017, there was no platform for users to trade different NFTs easily. OpenSea was created as a solution to allow users to trade crypto collectibles and other NFTs with one another. It was founded by Alex Atallah and Devin Finzer. This platform supports various categories of NFTs, ranging from art, music, collectibles, virtual lands, sports assets, and domain names to utility NFTs like membership passes. There is also an option to select a particular blockchain that an individual may prefer to explore. This platform offers an intuitive and beginner-friendly user interface, which makes it easy to use and navigate. To buy NFTs on Opensea, it is necessary to fund one's wallet with Ethereum (ETH). Interacting with digital objects is becoming routine as people increasingly live their lives online. The current phase that the world is undergoing is about digital-first creations. This is the reason that they are a part of the metaverse (a shared virtual space in which everyone creates.)

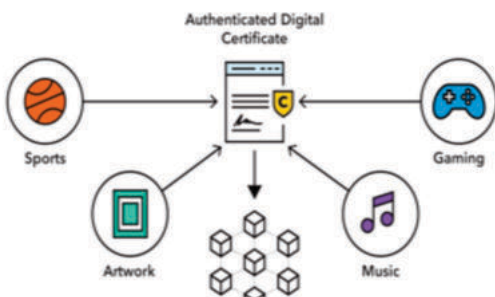


Figure 9: NFT Explained

Source: nft.com



Figure 10: Ethereum Vs Polygon  
Source: Playtomoon.com

**5. NFT's the New Space for Unicorns**

A movement towards the metaverse and the new digital economy has led to the emergence of Unicorns (a privately held startup company with a value of over \$1 billion.) in this sector. Some of the smartest money in the world –high-tech venture capital is flowing to an area that is involved in 'the digital economy', 'Cryptocurrency', as well as companies involved with NFTs. The crypto market of just "\$2 trillion", is at least 10 times larger than what it was in 2020.

Forty-eight companies are focused on cryptocurrencies, NFTs, and other foundations of a new metaverse-based digital economy. Crypto and NFT unicorns are focused on:

- 1) buying and selling,
- 2) digital infrastructure and analytics
- 3) other new digital services.

Unicorns are coming up in related areas eg hardware for cryptocurrency mining and operations, security and custody for digital assets, cross-blockchain applications, support in building blockchain applications, blockchain-based data analytics, etc. These are areas that are more frontline in the sense that they help companies and consumers create, sell, and invest in NFTs, purchasing and developing digital real estate, etc.

**6. India's NFT Ecosystem**

A large number of celebrities are moving into the NFT space as they see a new way to communicate with their audience. In India celebrities from the Indian Cinema and Cricket are increasingly launching digital memorabilia through NFT, hoping to earn thousands of dollars by cashing in on growing interest in such assets. Amitabh Bachchan's NFT series continues to be the most expensive NFT to be ever sold in India. They aim to cash in on their 'brand value.'



Figure 9: NFTs of Indian Celebrities  
Source: coincapture.com

**7. CONCLUSION**

There is an apparent new digital metaverse that has taken up the 'Unicorn Domain', by storm. Especially in the new

emerging NFT space. With the explosion of cryptocurrency and the digital metaverse, there has been an increasing interest in NFTs both in India and the rest of the world. This has led to NFTs being bought and sold at extremely high valuations. This sudden surge in their importance has been entirely based on the technology of 'Blockchain', which is considered to be the most secure as it manages a large-scale record of transactions as well as additional data wrapped in several layers of data security. Celebrities all over the world are using this medium, in a way to monetize their digital art that might not have been possible earlier.

#### Research Question:

With the increased adoption of AI, there has been a sudden spurt of its use in various spheres. How far is Blockchain technology applicable to Non-Fungible Tokens (NFT)? What is the type of systems that are followed in developing this field? How far are they lucrative propositions? Is this the areas where New Unicorns are likely to emerge? These and questions related to them will be attempted to be answered in the course of the paper.

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