

Current Scenario of Non-Fungible Token Market

Hina Gajera*

*Asst. Professor, Shree J D Gabani Commerce College & S A S College of MGT,
hinagajera@gmail.com*

Govind Dhinaiya

I/c Principal, Shree J D Gabani Commerce College & S A S College of MGT

Abstract

This study examines the state of Non-Fungible Tokens (NFTs) in the digital economy, with particular emphasis on underlying technologies and how these relate to NFTs. It also talks about the growth of the NFT market, trends and development, and key market players. A study concluded that smart contracts and blockchain technology, especially Ethereum, are essential to enabling decentralised transactions and equitable exchanges without middlemen. Prominent participants such as NBA Top Shot and OpenSea add to the thriving NFT ecosystem by demonstrating significant sales on platforms. Bollycoin and Jupiter Meta are two platforms that give the Indian NFT market more diversity. A significant increase in global sales volume highlights the transformative potential of blockchain technology in changing the dynamics of the global creative and entertainment industries as well as how digital material is owned, marketed, and transferred.

Keywords: NFT, NFT market, Blockchain, Ethereum, smart contract.

1. Introduction

The term "non-fungible tokens" (NFT) refers to digital assets, which are representations of tangible or intangible art or intellectual property, such as music, computer games, digital artwork, animated gifs, and video clips (Entriiken, W., Shirley, D., Evans, J., & Sachs, N., 2018). "Non-fungible" in an NFT refers to the fact that each token is a unique entity that represents a single particular thing and cannot be exchanged for another token. These tokens are made up of media like video, music, images, etc. with digital information that can be valued in terms of cryptocurrency. Particularly, the NFTs are a component of the Ethereum blockchain, but they are different from Ethereum coins.

Technological development and its expansion come with higher security issues, especially those related to genuineness. The distinctiveness and non-fungibility of non-fungible tokens (NFTs) are minimised if the problem of legitimacy and fake is not completely removed by incorporating a digital owner signature or name into each token, i.e., making it uncomplicated to identify the titleholder of an asset. Additionally, it considers the difficulty of deceiving the customer into buying fake products like tickets and artwork. Customers can quickly track down the real owner of the products for sale, thereby assuring the legitimacy of the transaction. Furthermore, the advent of NFTs is providing new opportunities for creative enterprises that previously struggled to build online markets in the age of digital world businesses because of the lack of limited ownership.

*Corresponding author

NFTs caught the attention of the public with CryptoPunks in June 2017 and Cryprokitties in November 2017, but they became more famous when Mike Winkelmann, a digital artist, sold his creation for close to 70 million USD, the largest art auction sale in history. The auction brought a great deal of consideration to NFTs, whose growth has been on a rising trend ever since its inception, receiving a lot of attention from creators, artists, and art fans. Previously, NFTs were only famous among a small part of the blockchain community, but now sales volume has continuously grown from USD 0.14 billion in 2017 to USD 23.74 billion in 2022 (source: <https://www.cryptoslam.io/nftglobal?timeFrame=year>).

2. Objective of the Study

- Present a comprehensive outline of NFT and its fundamental core technology.
- Identify the current scenario of the NFT market.
- Identify the recent trend and development of NFTs.

The study has been divided into three sections; the first section of the study includes a comprehensive outline of the non-fungible token and its importance. The second part of the study includes a brief introduction of various technologies based on which non-fungible tokens were generated. Furthermore, the third section of the study discusses the NFT market, the current scenario of the NFT market, its market size and growth, key market players, different marketplaces, and the and the most expensive NFT.

The future scope of the study includes developing robust valuation models considering rarity and subjective value, analysing market behaviour to understand speculative trends, and assessing the impact of regulations on NFT investments. Research can explore the integration of NFTs into decentralised finance (DeFi), such as using NFTs as collateral, and investigate the potential for tokenising real-world assets. Additionally, studies could focus on security risks, fraud prevention, and the long-term viability of NFTs as an investment class, considering both economic and technological advancements in the blockchain space.

3. Literature Review

Since the 1990s, the theory of blockchains and relevant extensions has been introduced (Buterin, 2013). Though it was not implemented effectively until a peer-to-peer electronic cash system based on cryptographic proof proposed by Satoshi Nakamoto, which has replaced a need for trusted third-party verification of every transaction (Nakamoto, 2008). Bitcoin came into continuation in 2009 and thereafter triggered the worldwide trend for cryptocurrencies and other blockchain technology applications. In 2013, Ethereum, an advanced framework of blockchain, was introduced by Vitalik Buterin. (Buterin, 2013; Chevet, 2018; Kim et al., 2018).

Ethereum transactions are based on the “smart contracts,” which are self-executing computer programs on a blockchain, and these contracts are executed when specified conditions are fulfilled. (Cong and He, 2019). In June 2017, the CryptoPunks encouraged the standard, the ERC-721 (Ethereum Request for Comments 721). It introduced a new type of digital token, generally known as “NFT” or the “non-fungible token” (Entriken, Shirley, Evans, and Sachs, 2018).

NFTs, or non-fungible tokens, are derived from the ERC-721 Ethereum protocol. Unlike normal cryptocurrencies like Bitcoin, the ERC-721 smart contracts have unique indicators and cannot be traded for other tokens. (Wang Qin and others, 2021) NFTs have the power to transform ownership and change a number of sectors, including the media, gaming, and creative industries. The most significant development is the incorporation of a royalty system into digital art. (P. Gonserkewitz, 2022; Popescu, A. D., May, 2021) NFT may be used in learning environments for tasks like creating content, producing master courses, micro-certificates, records, transcripts, and patents. (Wu Chih-Hung and Liu Chien-Yu) Non-fungible tokens can therefore be used for the exchange of digital assets that aren't limited to physical artistic creations as well as

physical assets that are equivalent to their digital counterparts. (Rehman Wajiha et al., December 2021). Artists and content producers have control over their works in the digital realm thanks to non-fungible tokens. They can manage scarcity, stop counterfeiting, and uphold copyright protection by implementing this creative model (Popescu, A. D., 2021, May).

Borri, N., Liu, Y., & Tsyvinski, A. et al (2022) published a paper titled “The Economics of Non-Fungible Tokens” to analyze the properties of the Non-Fungible Token (NFT) market, its relationship with the cryptocurrency market, and factors influencing NFT market returns. Study reveals that presence of size and return reversal effects in NFT returns, suggesting specific factors influencing the performance of the NFT market. Despite the exposure to the cryptocurrency market, a significant portion of the return variations in the NFT market remains unexplained, indicating the complexity and unique characteristics of the NFT market.

Hokianto, H. F. et al (2023, April 9) have done a study “ Non-Fungible Tokens: A Literature Review” to review literature on Non-Fungible Tokens (NFTs) to provide insights into the background, definition, creation process, investment opportunities, risks, and future prospects of NFTs . Author concluded that the NFT market is still young and under development, with an uncertain future that may lead to advancements in technology and opportunities for early investors . NFTs have the potential to benefit those who invest early, create, or develop technology related to NFTs.

4. Understanding Technology of NFT

This section includes a brief overview of NFT and discussion of the underlying technology, like blockchain and ethereum, smart contracts, the relation between NFT and smart contracts, and NFT market growth.

Blockchain

Blockchain (BC) is a general-purpose technology that has been viewed as one of the most crucial technology trends that will impact business and society in the coming years. Blockchain has come out as an undoubtedly disruptive, general-purpose technology for companies as well as governments to support information exchange and transactions that require validation and trust (Ko, Choi, Yli-Huumo Park, & Smolander, 2016). With the help of blockchain technology, the same information can be stored at different nodes, and the information can only be entered when the nodes have achieved consensus. New information can be entered, but old information cannot be eliminated, and each node can track the history. Storing transactions on various nodes is known as a distributed ledger. This minimises the reliance on a central authority and the risk of influence or system failure because all nodes have all the information. Blockchain can be used for the storage of important information, any change of ownership, and documents like licenses, certificates, government decisions, and legislation. Specifically, data stored in a blockchain is transactional data such as birth, marriage certificates, the ownership of property records, vehicle registration, educational certificates, business licenses, student loans, social benefits, votes, etc.

Ethereum

Ethereum is a community-run blockchain technology that powers the cryptocurrency Ether and the software platform that authorises hundreds of decentralised apps to be constructed and employed. It is a blockchain technology with an inherent Turing and comprehensive programming language. It has a theoretical layer that permits anyone to depict their own ownership, formats of transactions, and state of transition methods. This can be achieved through smart contracts, which are a collection of cryptographic rules performed only when specific conditions are met. Moreover, such a platform works as the basis for a virtual currency such as Ether, which is a crypto currency asset working on the Ethereum blockchain. Ether is the fuel for running Ethereum's distributed lagers. It is viable to transfer money to other machines or to accounts that are engaged in a certain task using this currency. Thus, Ethereum might be used to function decentralised

applications, create tokens, generate smart contracts, and make ordinary peer-to-peer payments. Due to that, Ethereum is also called a “programmable currency.” Ethereum includes electronic occupancy agreements (EOAs) and contracts. The EOA is controlled through a private key, whereas contract accounts are controlled through contract codes. An account includes four things like ether balance, contract code hash, and nonce, as well as storage root (Buterin, V. 2016). Ethereum uses a standard called ERC721 to manage non-fungible tokens (NFTs) in digital art. This standard allows for the creation of unique tokens that are distinguishable from one another through their hash identifiers.

Smart Contracts

Smart contracts were originally introduced by Szabo with the aim of acceleration, confirmation, or execution of digital transactions. Moreover, Ethereum developed smart contracts in the blockchain technology (Garay, J., & Kiayias, A. 2020). Blockchain-based smart contracts adopt scripting languages to achieve tedious functionalities and implement state transition duplication over consensus algorithms to understand and fix consistency. Smart contracts permit unfamiliar parties and decentralised participants to make fair exchanges without a trusted third party and further develop a unified method to construct applications across a broad range of sectors. The applications that function on top of smart contracts are based on state transition mechanisms. The states that contain the instructions as well as frameworks are shared by all the participants, ensuring transparency in the execution of these instructions. Also, the positions between states have to remain the same across distributed nodes, which is crucial for their consistency.

Smart contract and NFT:

The creation, ownership, and transfer of non-fungible tokens (NFTs) are intimately associated with the execution of smart contracts. When an artist or content creator mints an NFT, a related smart contract is triggered to set rules, ownership, uniqueness, and associated metadata. Smart contracts eliminate the need for middlemen by adding logic that verifies transactions and ensures that only the rightful owner can initiate transfers. This makes ownership and transfer of NFTs even simpler. Additionally, smart contracts can incorporate programmable features like royalty mechanisms that allow creators to automatically receive a portion of the resale value. Such programmability increases the potential for automated revenue streams. Moreover, NFT interchangeability between platforms is made possible by smart contracts, ensuring seamless NFT creation, purchase, and display on platforms that adhere to the same standards. Ultimately, the convergence of NFTs and smart contracts forms the basis for their creation, functionality, and cross-platform interoperability.

5. NFT Market

This section includes an overview of the NFT market since its inception; furthermore, it discusses the current scenario of the NFT market, its market size and growth, key market players, different marketplaces, the most expensive NFT and yearly global sales volume. NFTs were just getting started in the early years (2017–2018), and they were mostly utilised for gaming and collecting. The creation of the blockchain-based game CryptoKitties, which allowed users to gather and breed virtual cats, was one of the key events that occurred during this time. As a result, the idea of NFTs gained interest. The market has expanded beyond gaming into a number of industries, like art, music, virtual real estate, and more (2019–2020). Celebrities and artists started embracing NFTs as a cutting-edge method of monetising digital material. The proliferation of NFT use cases outside of gaming occurred during this time. 2021 was a critical year for NFTs. Major sales, like Beeple's digital artwork "Everydays: The First 5000 Days" selling for \$69 million at Christie's auction house, propelled its meteoric expansion. NFTs entered the mainstream thanks to the popularity of NFT markets like OpenSea. Beyond the arts and entertainment, NFTs attracted notice in sports and fashion.

The NFT market continued to develop in 2022. Transitioning to environmentally friendly blockchains was done in an effort to solve environmental problems. The world of digital art and larger culture continued to discuss NFTs. Despite changes in the number of individual users, NFT trading volume has remained consistent. This shows that there is ongoing NFT trading activity, with active NFT traders taking part frequently. NFTs continue to garner a lot of interest despite discussions regarding the market's viability. The fact that so many people and organizations are still using NFTs shows how current the technology and its uses are. The NFT market is worldwide in scope and not restricted to any one area. India, for instance, is heavily involved in the NFT industry, demonstrating how The NFT market is dynamic and constantly changing, with new initiatives, markets, and technologies appearing on a daily basis. According to this evolution, the NFT space is not at all static.

Market growth

In recent years, the global sales volume of NFTs (Non-Fungible Tokens) as shown in table 1 below has experienced an unprecedented rise, reflecting the expanding interest in and adoption of digital assets around the globe. The market has seen a rise in sales across numerous categories, including digital art, collectibles, music, and virtual real estate, as each NFT represents a distinct and irreplaceable digital property. This significant increase in global sales volume highlights the transformative potential of blockchain technology in changing the dynamics of the global creative and entertainment industries as well as how digital material is owned, marketed, and transferred. The market for non-fungible tokens, or NFTs, has shown noteworthy growth and impact figures.

Table 1: NFT Global Sales Volume

Year	Sales (USD)	Unique Sellers	Unique Buyers
2023	8700.83M\$	42,13,902	9,07,34,299
2022	23741.45M\$	38,20,006	54,20,982
2021	15595.87M\$	36,84,413	47,76,541
2020	18.20M\$	25,552	39,022
2019	3.75M\$	5,689	6,939
2018	1.55M\$	1,194	3,908
2017	.14M\$	76	155

Source: <https://www.cryptoslam.io/nftglobal?timeFrame=year>

The market for non-fungible tokens (NFTs) is robust and dynamic, according to statistics. The worldwide NFT market is anticipated to grow significantly, according to a number of sources. Revenue is predicted to reach about \$2378 million in 2024, a considerable rise over \$1601 million in 2023. The NFT sphere has a notable user base, with 13.95 million users as of 2023 and projections showing a rise to 16.35 million users by 2028, demonstrating the growing popularity and adoption of NFTs. All of these figures shown in table 2 highlight the importance of the NFT market, which is characterised by significant revenue, an expanding user base, and ongoing advancements in certain niches like the art market. The data is indicative of the dynamics that are changing and the ongoing interest in the NFT space.

Table 2 : NFT Projections Worldwide

Particulars	Amt In
Revenue in the NFT market	US\$2,378.00m in 2024.
Annual Growth rate (CAGR 2024-2028)	9.10% (Amounted US\$3,369.00m by 2028)
Average revenue per user	US\$162.10 in 2024
Highest revenue (global comparison)	US\$1,122,000.00k in 2024(The United States)
Number of users	16.35m users by 2028.

Source: <https://www.statista.com/outlook/dmo/fintech/digital-assets/nft/worldwide>

Key market players

The Non-Fungible Token market is thriving and diversified, through prominent participants who have had a big impact on its development. With a broad selection of NFT categories, including virtual real estate, collectibles, and digital art, OpenSea stands out as one of the biggest and most well-known NFT marketplaces. Through its RARI governance token, the decentralised platform Rarible gives users a say in platform development while enabling artists to mint and sell their NFTs. While NBA Top Shot delivers officially licensed NBA collectible moments as NFTs, CryptoKitties, an early pioneer, focuses on distinctive digital cat collectibles. SuperRare specialises in high-quality digital art NFTs. NFTs are introduced into a blockchain-based virtual world by Decentraland, whilst Binance NFT Marketplace makes use of the sizable user base of a significant cryptocurrency exchange. Enjin caters to NFTs in the gaming industry, while Ethernity Chain mixes NFTs with charitable donations and Audius incorporates NFTs into music streaming to empower artists. While Axie Infinity gamifies NFTs with collectible creatures, Nifty Gateway offers a full platform for primary and secondary sales of digital art and collectibles. Projects like NBA Top Shot are hosted by Flow, a platform for NFTs and decentralised applications. These participants show how the NFT ecology is dynamic and varied, and how ongoing changes are continuing to change the environment.

Different online marketplaces provide a platform for buying and selling Non Fungible Tokens, out of which some are more popular than others, as revealed. All marketplaces do not sell the same works of art or collectibles; the kind of collectible is merely decided by the type of market. The greater part of these marketplaces sell a varying range of Non Fungible Tokens, but each platform operates differently. The largest and most significant Non Fungible Token Marketplace is considered to be OpenSea. Top 5 marketplace rankings according to volume and most expensive NFT sold on different markets are shown in Table 3 and Table 4 respectively as on 2nd Feb, 2024.

Table 3: Top 5 NFT marketplace

Rank	NFT Marketplace	Traders	Volume
1	Blur	5.25k	\$14.96M
2	Okx NFT	3.69k	\$5.17M
3	Magic Eden	10.49k	\$3.32M
4	Opensea	12.31k	\$2.74M
5	UniSat	3.67k	\$2.07M

Source: <https://dappradar.com/rankings/nft/marketplaces>, as on 2nd Feb, 2024

Table 4: Most expensive NFT

NFT	Sold on	Price
OrdinalPunks #c9b..	Magic Eden	\$169.11k
CryptoPunk #5378	CryptoPunks	\$133.6k
Fidenza #109	OpenSea	\$131.0k
CryptoPunks #2443	Blur	\$122.13k
Doodle #7489	OpenSea	\$115.3k

Source: <https://dappradar.com/rankings/nft/sales>, statistics as on 2nd Feb,2024

In India, Jupiter Meta, which was founded in Chennai in 2021, quickly became known as a notable NFT marketplace by providing a varied platform on which users can trade NFTs and other digital assets, thus contributing to the development of the Indian NFT ecosystem. BeyondLife.club distinguishes itself by offering a special place for producers and collectors, serving as a major marketplace for buying and selling NFTs, and enhancing the activity of the NFT community in India. Bollycoin brings a distinct flavour to the Indian NFT scene by taking a specialised approach and concentrating on Bollywood and entertainment-related NFTs. Colexion, on the other hand, enhances the dynamic environment by giving NFT enthusiasts a place to explore and exchange digital assets, encouraging communication and teamwork among a burgeoning community. By serving the varied interests and preferences of the growing NFT community, these platforms collectively add to the diverse and dynamic character of the Indian NFT market.

Recent Trend and Development of NFT

The digital asset landscape has been redefined by notable trends and advancements that have occurred in the NFT market, resulting in dynamic transformations. One significant change is the incorporation of NFTs into the metaverse, which enhances the virtual environment by providing users with new features and immersive experiences. It is clear that NFT use cases are becoming more diverse: the music industry is adopting NFTs to monetize concert experiences and tokenized music, while gaming NFTs are becoming widely used and essential components of gaming ecosystems. NFTs have shown practical value in the real estate industry, where they have facilitated property ownership and transactions. As artists use blockchain technology to tokenize and trade their works, the NFT market in the digital art space is still growing.

With projects highlighting inclusivity and shared participation among NFT enthusiasts, community-driven ownership has emerged as a key trend that encourages a sense of group engagement. The NFT space is experiencing ongoing technological innovation, which has expanded its scope of use by encouraging the exploration of new applications beyond traditional digital assets. Deeper integration of NFT marketplaces with a variety of metaverse industries, such as fashion, real estate, sports, and music and art, is one trend that is anticipated. Together, these trends show how the NFT market has evolved in the digital age, with its trajectory shaped by an increasing number of use cases, increased community involvement, and integration with emerging technologies.

6. Findings

Non-Fungible Tokens (NFTs) are distinct digital assets that, on a blockchain, stand for the ownership or authenticity of a particular object or piece of content. NFTs cannot be exchanged one to one like traditional cryptocurrencies like Bitcoin or Ethereum because they are indivisible. Because each NFT has unique qualities, they are all unique and irreplaceable.

Blockchain allows for decentralised transactions, which transforms society and business. Ethereum facilitates fair exchanges without middlemen by powering decentralized apps with smart contracts. NFTs in digital art are managed by Ethereum's ERC721 standard. Smart contracts and NFTs are closely related in that contracts are triggered when NFTs are created, guaranteeing one to one interchangeability.

OpenSea and NBA Top Shot are two notable players that add to the vibrant NFT ecosystem. Prominent marketplaces like OpenSea exhibit notable sales, as demonstrated by OrdinalPunks #c9b and CryptoPunk #5378. The NFT market in India offers more variety with platforms like Bollycoin and Jupiter Meta. There are various applications of NFT including the metaverse, music, gaming, and real estate. Key trends, including community-driven ownership and ongoing technological innovation, shape the continued evolution of the global NFT market.

7. Conclusion

Non-Fungible Tokens (NFTs) are distinct digital assets on a blockchain that denote the ownership or genuineness of particular items or content. NFTs are unique, irreplaceable assets that are indivisible, in contrast to conventional cryptocurrencies. Through smart contracts, blockchain technology, especially Ethereum, is essential to enabling decentralised transactions and equitable exchanges without middlemen. NFTs in digital art are managed by Ethereum's ERC721, where smart contracts guarantee one-to-one interchangeability at the time of creation. Prominent participants such as NBA Top Shot and OpenSea add to the thriving NFT ecosystem by demonstrating significant sales on platforms like OpenSea with products like OrdinalPunks #c9b and CryptoPunk #5378. Bollycoin and Jupiter Meta are two platforms that give the Indian NFT market more diversity. NFTs are used in a variety of industries, such as real estate, gaming, music, and the metaverse. The community-driven ownership model and continuous technological innovation are two important trends that are influencing how the global NFT market will continue to develop.

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