An Overview of Non-Fungible Tokens (NFT)

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Abstract: *The Non-Fungible Token (NFT) market is mushrooming in recent years. In recent years, NFTs have garnered remarkable attention from both the industrial and scientific communities. The concept of NFT originally comes from a token standard of Ethereum, aiming to distinguish each token with distinguishable signs. This type of token can be bound with virtual/digital properties as their unique identifications. NFTs have the potential to transform the arts, sports, music and gaming. In the next few years, for example, football teams may provide the majority of their ticket options via fan tokens. Furthermore, because to larger revenues than existing traditional methods in the music industry, decentralised music streaming initiatives may be more popular among musicians. There are various emerging initiatives in this industry based on NFT and decentralised technology, but it takes time for them to gain popularity among people and industries worldwide.*

Keywords: Non-Fungible Token, NFT, Blockchain, Ethereum, Cryptocurrency

I. INTRODUCTION

An entirely digital art work was sold for the equivalent of $69 million in March 2021. Anyone on the Internet can freely watch or access this work of art by the artist *Beeple*. So, why was such a high price paid for it? Perhaps because this particular work of art is an NFT. NFTs are blockchain-based tokens that can be used to represent ownership of a work of art, futures contract, music score, book, real estate, and so on - any form of object that is unique or rare. Because NFTs are minted, held, and exchanged on a blockchain, they cannot be stolen or exploited by malicious individuals. Conversely, NFTs may give quick verification of authenticity and provenance, thereby removing the problem of counterfeiting.

II. TAXONOMY OF NFT

NFTs are blockchain-based tokens that map ownership rights to digital assets in a safe manner. NFTs are available for purchase on dedicated marketplaces such as OpenSea, Axie Marketplace, and Rarible. Investors may also trade the property right to the asset comprising the NFT on these platforms. NFTs may also be set up such that the original creator earns a share of any future purchases since they employ smart contract technology. NFTs, like cryptocurrencies and other forms of tokens, rely on blockchain technology and smart contracts as their digital counterparts. NFTs act as an asset rather than a money, commodity, or technology.

Cryptocurrencies such as bitcoin and other forms of blockchain tokens are fungible. There is no different between two Bitcoins or two shares—it makes no difference which of the two you hold since they are all worth the same amount. Non-fungible tokens (NFT) are a type of blockchain-based token that is particularly non-fungible, which means that one NFT cannot be traded for another because each one is unique. This uniqueness permits the use of NFTs to validate ownership of digital assets. Many NFTs are built on the Ethereum blockchain, and smart contracts are issued using ERC-20, ERC-721, ERC-1155, and other token standards. Thus, NFTs are decentralised applications with high degrees of verifiability, tamper resistance, usability, atomicity, and traceability. As a result, each NFT represents a distinct value that cannot be completely substituted by another token. A simple example is Beeple's digital work, which sold for $69 million. The artist developed a single NFT token that represents the rights to the digital art asset. Internet users may examine artwork in the same way that actual art can be viewed in museums without owning it. But there is simply one owner. CryptoPunks and Decentraland are two others prominent NFTs. The CryptoPunks are a group of more than 10,000 randomly produced characters (6039 males and 3840 females). Each one is unique, and each one may be

formally held by a single individual on the Ethereum blockchain. The entire CryptoPunks collection, created in 2017 by Larva Labs.

III. NFT RELATED TOKEN STANDARDS

This section will explain NFT token specifications. Many NFTs are built on the Ethereum blockchain, and smart contracts are built using ERC-20, ERC-721, ERC-1155, and other token standards. These requirements contain the norms or criteria that must be met in order for a trade to take place. These token standards, coupled with the blockchain, assist to eliminate the need for intermediaries while also keeping track of all transactions. The most widely used token standard is ERC-20. It presents the notion of fungible tokens, which may be issued on top of Ethereum after meeting the prerequisites. An autonomous token is always equal to all other tokens.

ERC-721 proposes a non-fungible token standard in contrast to the fungible token standard. This form of token is distinct and distinguishable from others. Every NFT, in particular, contains an uint256 variable called tokenId, and the combination of contract address. The uint256 tokenId is globally unique. Furthermore, the tokenId may be used as an input to produce special authentication such as zombie or cartoon character graphics.

ERC-1155 is a smart contract interface for tokens that are fungible, semi-fungible, or non-fungible. ERC-1155 can fulfil the functions of both ERC-20 and ERC-721, and even both at the same time. As a result, the ERC 1155 standard is ideal for issuing many tokens at the same time, as well as the option to include both fungible and non-fungible tokens. Each Token can represent a different value depending on whether it is fungible, semi-fungible, or non-fungible. ERC-1155 may be used to create NFTs, redeemable shopping vouchers, and ICOs, among other things.
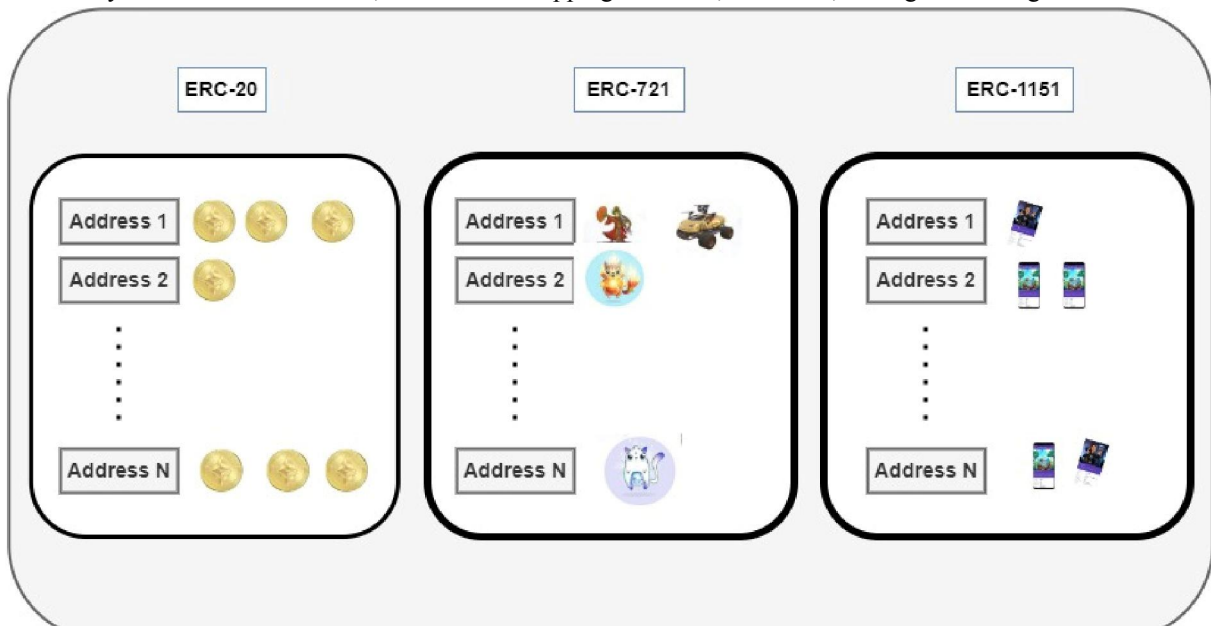

Figure 1: NFT related Token Standards

IV. NFTS DESIRED PROPRIETIES

The following are the essential properties of NFT.

1. **Authenticity.** The NFT, together with its token information and ownership, is publicly verifiable.
2. **Availability.** The NFT system is never down. Alternatively, all tokens and NFTs are always available for sale and purchase.
3. **Openness in Execution.** NFT operations like as minting, selling, and purchasing are open to the public.
4. **Tamper-resistance.** Once the transactions are declared validated, the NFT metadata and trade records are constantly preserved and cannot be changed.
5. **Usability.** Every NFT contains up-to-date ownership information that is user-friendly.

V. HOW TO CREATE YOUR NFT

Digital artwork, such as photographs, animated films, or music, is commonly used to depict NFTs. They may be bought and sold on NFT platforms, which usually accept cryptocurrencies as payment. NFTs may be generated on NFT platforms, allowing you to mint (make or produce something) and submit your artwork to a blockchain. NFT creation is supported by many blockchains, the most prominent of which being Ethereum. An NFT can be created via an NFT marketplace or a crypto exchange that supports NFT minting.

Step 1: Decide What You Want to Make.

Step 2: Select a Blockchain, such as Ethereum, Solana, or Flow.

Step 3: Construct an NFT wallet. MetaMask, Coinbase Wallet, and other well-known wallet software support several blockchains.

Step 4: Select an NFT Platform or marketplace, such as OpenSea, Solanart, or others.

Step 5: Construct the NFT

Step 6: Put the NFT on the market. Depending on the NFT platform, you can:

Sell it at a fixed price

Set a timed auction

Start an unlimited auction

VI. OPPORTUNITIES OF NFT

This section explores the opportunities of NFTs.

- The NFT universe enables for the tokenization and monetization of digital assets like as recorded moments, games, collectibles, trading cards, music, memes, e-tickets, wallet and domain names, and even Metaverse property.
- Asset ownership that has been tokenized into an NFT may be transferred more simply and effectively among persons anywhere in the world.
- In the game sector, NFT has enormous potential.
- When used in the event organisation business, such as popular music festivals, NFTs can serve as an e-ticket to assure transparency and afterwards become a memento. Organizers may also collaborate with artists to produce one-of-a-kind, randomly generated artwork for these NFT e-tickets, making them into tradeable, collectible objects with high market value after the event. The term "NFT-based ticket" refers to a ticket issued by the blockchain to verify eligibility to attend any event, such as culture or sports.
- In most circumstances, artists cannot get royalties from future sales of their works. NFTs, on the other hand, may be set such that the artist earns a fixed royalty fee each time his digital artwork trades in the markets.

VII. CHALLENGES OF NFT

The key challenges of adopting the NFTs are as follows:

- The exponential growth of the digital world, as well as the exponential rise in popularity of NFTs, has resulted in significant cybersecurity and fraud vulnerabilities.
- Current NFT systems are tightly connected with their underlying blockchain platforms, resulting in poor performance.
- High gas prices have become a significant issue for NFT markets, particularly when minting NFTs on a big scale that necessitates uploading the information to the blockchain network.
- Because smart contracts require computing resources and storage to be executed, every NFT-related transaction is more expensive than a basic transfer transaction.
- The majority of NFT transactions rely on the Ethereum platform, which only provides pseudo-anonymity rather than complete anonymity or privacy.
- Existing NFT ecosystems are disconnected from one another. Once a user has chosen a product category, they can only sell/buy/trade it inside the same ecosystem/network.

Impact Factor: 6.252

VIII. CONCLUSION

Despite their enormous potential influence on present decentralised marketplaces and future economic prospects, NFT technologies are still in their infancy. In the future, NFT technology is expected to continue its growth and appeal in a variety of fields. NFT is a developing trend in crypto and blockchain technology, however it accounts for a small portion of the overall crypto technology. According to experts, it takes time to become popular among all individuals. Because decentralisation is the technology of the future, NFT have the potential to expand fast. Some possible obstacles must be properly addressed, while some prospective prospects must be highlighted.

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