

NFT Marketplace

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Abstract-Non-Fungible Tokens (NFTs) have garnered remarkable investor attention recently, with some NFTs securing selling prices that may have seemed unthinkable for a non-fungible virtual asset. It is quite clear that blockchain technology and NFTs can offer the perfect opportunity for artists and content creators to obtain financial remuneration for their works. Now, artists don't have to depend anymore on auction houses or galleries for selling their artwork. On the contrary, an artist could just sell their work to a buyer in the form of NFT. The marketplace allows people to buy, sell and trade NFT art. If you seek an industry that functions as a massive revenue stream for talented people like composers and artists, then NFT marketplace development can be the perfect match. The NFT cap serves as great proof of an industry expansion; in 2022 ,it achieved the mark of \$828 million. NFT marketplace development is a unique opportunity for individuals to show up and represent their collectibles to encourage effective digital asset management. The NFT and its markets have grown significantly since early 2021. Since Blockchain is a relatively newer technology, resources are less and quite difficult to find the perfect one which makes it even more difficult to build a complex NFT Marketplace. NFTs have various use-cases and the NFT marketplace is supposed to be at the core of all those great use cases by providing the users a platform to mint and trade the Non-Fungible tokens.

Keywords – NFT, Token, Blockchain, Market, Asset, Ethereum, Fungible.

1.INTRODUCTION

There is a category of blockchain-based virtual assets known as non-fungible tokens (NFTs) which have garnered incredible investor interest in a very recent and short period. NFTs are described by some as a craze, and by others as the future of digital art. Investors have expressed interest in various types of

NFTs, with some being auctioned in the millions of dollars. Non-fungibility is a property that is tangential to the original premise of a distributed virtual ledger; it may come to represent a significant alternative space of blockchain development and exchange going forward. For the purposes of definition, a non-fungible token can be seen as a unit of digital information (token) that is stored on a blockchain and is not inherently interchangeable with other digital assets (non-fungible). The term “fungible” derives from the economic and accounting literatures, and is defined as anything that is interchangeable with an identical or similar object. Traditional forms of currency, whether equivalent sums of paper money or identical units of precious metals, are fungible objects, and this is what helps them to serve as mediums of exchange, because they are understood to be of equal value. The mechanism for NFT creation relies on uploading a file onto an NFT auction market, where the file is recorded on the digital ledger as an 1 NFT, and can thus be purchased or sold using digital currencies. While the creation of an NFT that represents a piece of art can be exclusive to an artist, they can nevertheless retain the copyright to the work and therefore reproduce more NFTs underpinned by the same piece of art. For this reason, a person who purchases an NFT does not gain necessarily possession of the original digital file, and therefore does not have exclusive access to the file. Aside from artwork, various digital collectible NFTs have also sold for comparatively high prices, such as a basketball-related NFT selling for \$208,000 and so have videogame-based NFTs. Beyond visual artistic works, audio-centered creative works can also be tokenized as NFTs.

2.TIMELINE OF NFTS

On May 3rd, 2014, digital artist Kevin McCoy

minted the first-known NFT 'Quantum' on the Namecoin blockchain. 'Quantum' is a digital image of a pixelated octagon that hypnotically changes color and pulsates in a manner reminiscent of an octopus. Following these events, a significant amount of experimentation and development occurred and there were platforms built on top of the Bitcoin blockchain. The Ethereum blockchain also started its initial reign over NFTs. The Counterparty platform (Bitcoin 2.0) was established and gained ground as a platform that enabled the creation of digital assets. Spells of Genesis followed close behind in the footsteps of Counterparty and began pioneering in the issuing of in-game assets. 2016 beckoned on the age of the meme and saw the release of a host of Rare Pepes NFTs on the Counterparty platform.

The big shift for NFTs to Ethereum was backed up with the introduction of a set of token standards, allowing the creation of tokens by developers. The token standard is a subsidiary of the smart contract standard, included to inform developers how to create, issue and deploy new tokens in line with the underlying blockchain technology.

Two software developers; John Watkinson and Matt Hall, followed up the success of the Rare Pepes with their own generative series of NFTs on the Ethereum blockchain which they branded as CryptoPunks. CryptoPunks are considered some of the first NFTs created and originally offered for free.

The experimental project, limited to 10,000 pieces with no two characters the same, was inspired by London punk culture and the cyberpunk movement. NFT gaming and metaverse projects were in the spotlight and the first to break ground in this space was Decentraland (MANA), a decentralized VR platform on the Ethereum blockchain.

Another blockchain-based trade and battle game also emerged, Axie Infinity (AXS), a game that is partially owned and operated by its players. via dedicated marketplaces. Potential buyers can look up through the NFT Marketplace for the NFTs they desire and can easily place a bid on them or buy them. 2021 became the year of the NFT and there was a huge explosion and surge in NFT supply and demand. One of the biggest factors in this boom was the huge changes that occurred within the art market and the industry at large, when prestigious auction houses; Christie's and Sotheby's, not only took their

auctions into the online world but also began selling NFT art.

As well as the surge in demand for NFTs that resulted from the famous Christie's auction, another knock-on effect was other blockchains getting involved and starting their own versions of NFTs.

Towards the end of the year, once Facebook rebranded as Meta and moved into the metaverse, the surge in NFT demand and especially within the metaverse was remarkable.

3.WORKING OF NFT

The process used in NFT creation includes uploading the file on the NFT market place [2], where it is saved as an NFT on the digital ledger and so that it can be bought or sold using digital currency.

While an artist's creation of an NFT which reflects a work of art may be exclusive to them, they can maintain the copyright to the work and so manufacture more NFTs based on the same work.

As a result, a person who purchases an NFT does not automatically acquire copyright of the original digital file, nor does he or she have exclusive access to it. The origination problem, which is ubiquitous in other forms of blockchain technology, is also available in the NFT space: anybody may potentially contribute their own or someone else's artwork to an NFT without establishing that they are the original artist. This increases the real-world risk of imposters uploading NFTs to auction platforms under the guise of being the genuine owners or manufacturers of valuable products. Because it is a peer-to-peer system, no central authority is required to approve or execute operations. NFT tokens have such characteristics and hold values that they cannot be modified. Each bears a digital signature that prohibits NFTs from being substituted for or compared to one another. Artists can sell their NFT artworks

4.CORE COMPONENTS OF NFTS

- Blockchain

Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. Business runs on information.

The faster it's received and the more accurate it is, the better.

Blockchain is ideal for delivering that information because it provides immediate, shared and completely transparent information stored on an immutable ledger that can be accessed only by permissioned network members.

Operations often waste effort on duplicate record keeping and third-party validations. Record-keeping systems can be vulnerable to fraud and cyberattacks.

Limited transparency can slow data verification. Because it provides a secure environment for smart contract execution, Ethereum is the most often used blockchain platform in NFT schemes.

- **Smart Contract**

Smart contracts are apps on a blockchain that make each side of a transaction complete its part.

For example, a smart contract could initiate a fund transfer with a third party to verify that the transfer took place.

Smart contracts are scripts that automate the actions specific to a contract between two parties.

Smart contracts do not contain legal language, terms, or agreements, only code that executes actions when specified conditions are met.

Nick Szabo, an American computer scientist who invented a virtual currency called "Bit Gold" in 1998, defined smart contracts as computerized transaction protocols that execute the terms of a contract.

Ethereum has smart contract capabilities inherent to its blockchain.

The Bitcoin blockchain received smart contract abilities after its Taproot upgrade, which allowed it to communicate to layers that have smart contracts enabled on their blockchains.

Most NFT systems leverage smart contract-based blockchain platforms to enable order-sensitive executions.

- **Address and Transactions**

Blockchain addresses and transactions are fundamental concepts in cryptocurrencies. A blockchain address is a unique identifier allowing a user to move and receive assets, just like a bank account when using money in a bank.

To transfer NFTs, the owner must show that s/he possesses the appropriate private key and send the assets to another address(es) using a valid digital

signature.

This straightforward activity is typically performed using a bitcoin wallet and is referred to as submitting a transaction to use the ERC-777 [8] smart contract standard.

- **Data Encoding**

The Bitcoin network features intentional computational restrictions in its core software, as it is intended to be used for bitcoin transactions.

However, different workarounds have been successfully tested to encode arbitrary data into the blockchain. Encoding is the process of changing data from one type to another. Many files are often encoded in either efficient, compressed formats to conserve memory or uncompressed formats to achieve high quality/resolution.

Blockchain systems such as Bitcoin and Ethereum, hex values are utilized to encode transaction components such as function names, arguments, and return values.

- **Tokenization**

NFTs are an integral part of the internet's and commerce's future, and organizations of all sizes are starting to take notice. Many have dipped their toes into the digital waters with lines of NFT artwork, but there are other options that can have a greater impact on fans. NFT tokenization, specifically, is a way for anyone to leverage assets they already own as digital collectibles. NFT tokenization is the process of minting and selling an NFT asset, which could be a rare guitar, jersey, artwork, or anything else. Once the asset has been minted as an NFT, users buy and sell it on a marketplace in much the same way as they would buy any other type of memorabilia. The owner can then have the physical item shipped to them, should they so choose. Tokenized NFT assets are liquid, and because their markets never close, they benefit from 24/7 transactions. The market remaining perpetually open is particularly important, as NFT creators receive commissions whenever one of their NFTs is sold, which equates to higher revenue from each asset. NFTs are also released globally valuable market access that gives organizations more opportunities to experiment.

To be compliant with the common standards, a smart contract must adhere to a token standard, which is an interface and a set of rules.

1.ERC-721 Non-Fungible Token Standard concerns tokens where each token is distinct (aka non-fungible) and thus enables the tracking of distinguishable assets. Each asset's possession must be managed separately and atomically.

2.ERC-1155 Multi Token Standard allows for the management of any combination of fungible and non-fungible tokens in a single contract, including transferring multiple token types at once. Compliant tokens must implement six necessary functions and four events according to this standard.

5.POTENTIAL FUTURE IN THE INDIAN NFT MARKET

Globally, the market for NFTs is valued at \$40 billion as of this year. In India, the NFT industry is valued at an estimated \$3.3billion with a cumulative average growth rate of 61.6 per cent, and expected to reach an estimated \$27 billion by 2028. Currently 11 NFT companies are headquartered in India, constituting 5.02 per cent of the total NFT companies in the world. In 2021 alone, India added 71 NFT startups to its tally and has 86 active NFT startups today, reflecting a positive response from the entrepreneurial market.

NFTs have witnessed widespread adoption from artists, creators, entertainment and sports celebrities, brands, and more due to a diverse range of use cases.

NFTs have been leveraged by creators and brands in order to increase awareness and engagement among consumers and enthusiasts, generate new revenue streams, provide access to exclusive events as tickets, and even be used as digital contracts for owning real estate in the metaverse, displaying a diverse range of utility.

Thus, NFTs present a lucrative investment option for investors in India with the potential to grant favorable returns on investment.

Properties

Because NFT systems are fundamentally decentralized applications, they benefit from the features of their underlying public ledgers. The following is a list of the most important properties.

1.Authenticity

The existence of the NFT, as well as its token metadata and ownership, can be verified publicly.

2.Transparent Performance

The activities in NFTs, such as minting, selling, and purchasing, are all visible to the whole public.

3.Accessibility

The NFT system is impenetrable to failure.

Alternatively, all tokens and issued NFTs are available for purchase and sale at all times.

4.Tamper-resistance

Once a transaction is considered genuine, the NFT metadata and trading records are stored indefinitely and cannot be modified.

5.Usability

Every NFT has the most up-to-date ownership data, which is both user-friendly and rich in information.

6.Atomicity

A single atomic, consistent, isolated, and durable (ACID) transaction can be used to trade NFTs. The NFTs can all be in the same running state at the same time

6.COMPARISON OF NFT MARKET WITH TRADITIONAL MARKET

Digital vs. physical assets: Unlike traditional markets, which deal with physical assets like stocks, bonds, and real estate, the NFT marketplace deals exclusively with digital assets. NFTs are unique, one-of-a-kind digital tokens that represent ownership of a specific piece of content, such as artwork, music, or videos.

Global accessibility: The NFT marketplace is accessible to anyone with an internet connection, regardless of their location. This means that buyers and sellers can participate in the market from anywhere in the world, which has the potential to create a more diverse and global marketplace.

Transparency and authenticity: One of the benefits of the blockchain technology that underpins the NFT marketplace is that it provides a high level of transparency and authenticity. Each NFT is stored on the blockchain, which is an immutable ledger that records every transaction. This means that buyers can be confident that the NFT they are purchasing is

genuine and that they have proof of ownership.

Exclusivity: NFTs are often marketed as exclusive and unique items, which can drive up demand and prices. This is in contrast to traditional markets, where assets like stocks and bonds are often fungible, meaning that one unit is interchangeable with another.

Volatility: The NFT marketplace is still relatively new, and as such, it can be highly volatile. Prices can fluctuate wildly based on market sentiment, and there is a lack of historical data to help investors make informed decisions.

Overall, the NFT marketplace represents a new and unique asset class that has the potential to disrupt traditional markets in a number of ways.

While there are certainly some significant differences between the NFT marketplace and more traditional markets, both have their own unique benefits and drawbacks. As the NFT marketplace continues to evolve, it will be interesting to see how it compares to more established markets over the long term.

7. WORTH OF NFTS

It is only worth what others are prepared to pay for it. The buyers and sellers in a fragmented, distributed online market send signals about how much they want

a (digital) object. This is true for collectibles and works of art, where huge sums are paid to acquire real, physical objects based on their perceived scarcity.

In theory, anybody can tokenize their work to sell as an NFT but interest has been fuelled by headlines of multi-million-dollar sales. An animated Gif of Nyan Cat - a 2011 meme of a flying pop-tart cat - sold for more than \$500,000 (£365,000).

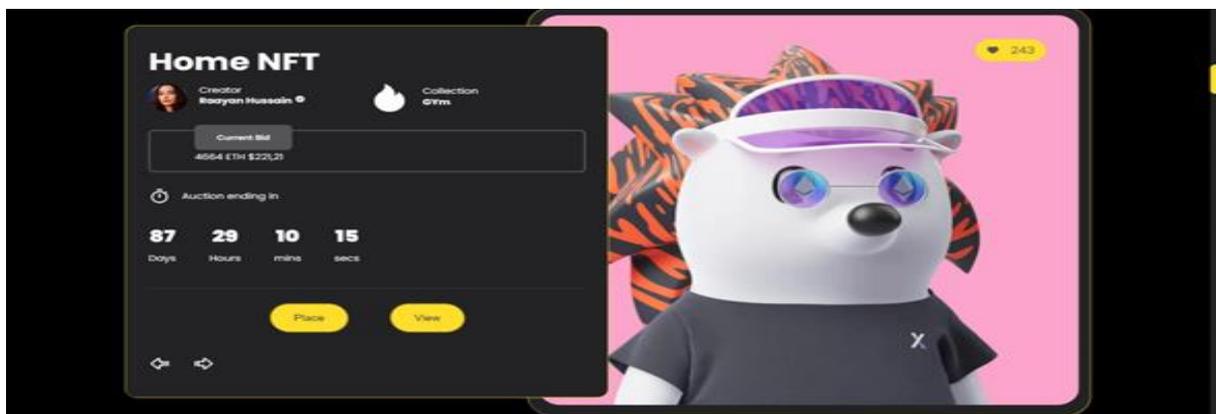
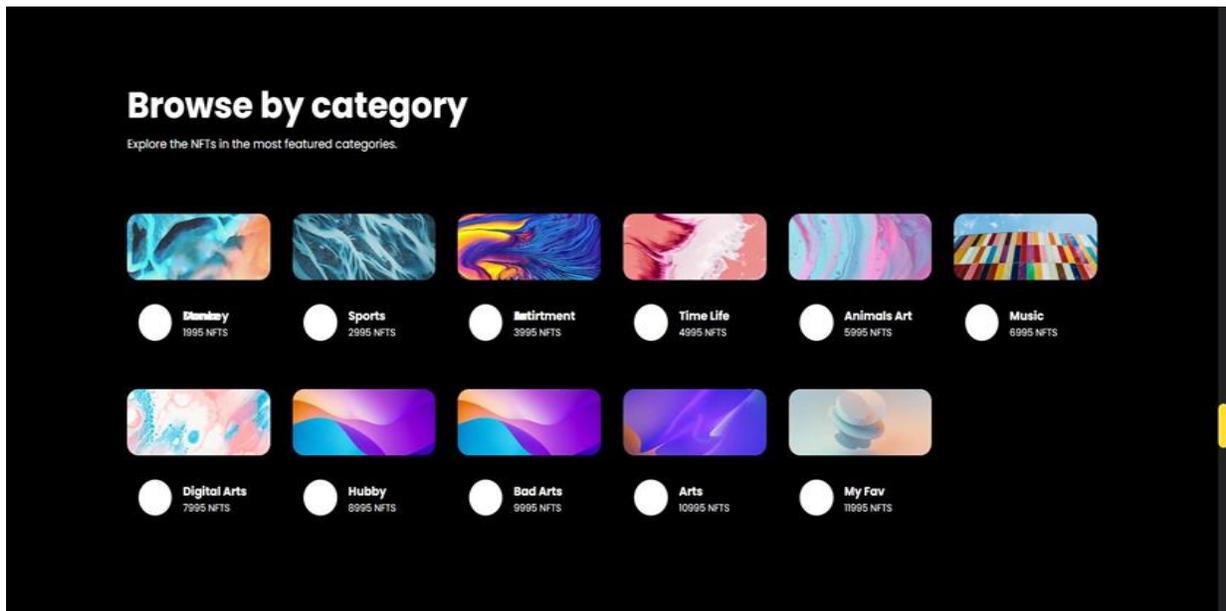
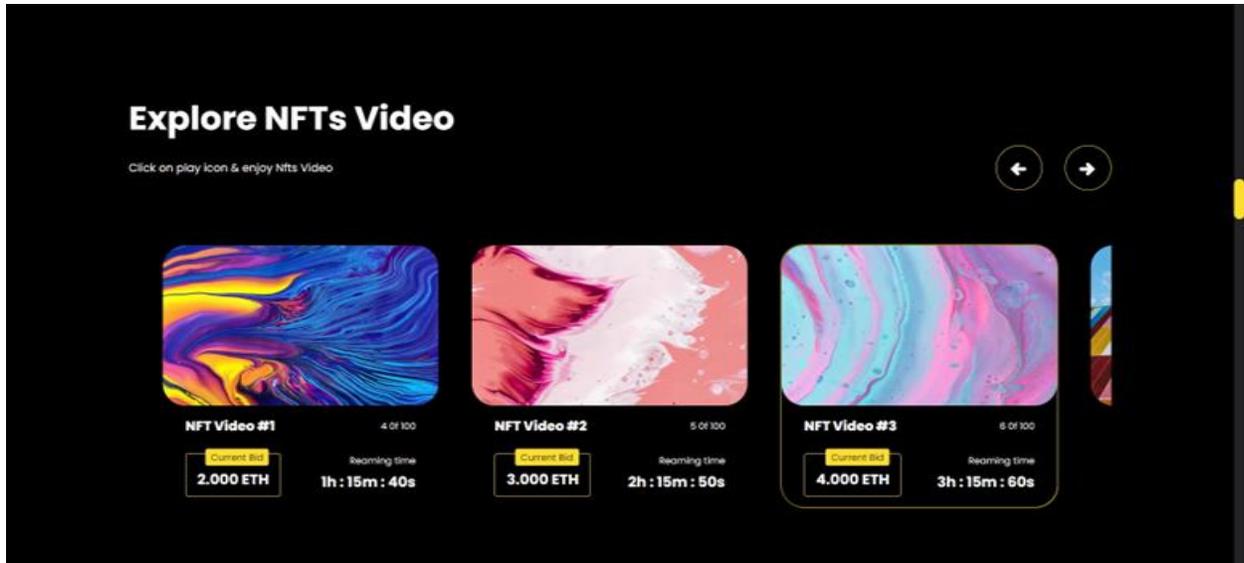
A few weeks later, musician Grimes sold some of her digital art for more than \$6m. It is not just art that is tokenized and sold. Twitter's founder Jack Dorsey has promoted an NFT of the first-ever tweet, with bids hitting \$2.5m. Christie's sale of an NFT by digital artist Beeple for \$69m (£50m) set a new record for digital art. French firm Sorare, which sells football trading cards in the form of NFTs, has raised \$680m (£498m). Millions of people have seen Beeple's art that sold for \$69m and the image has been copied and shared countless times.

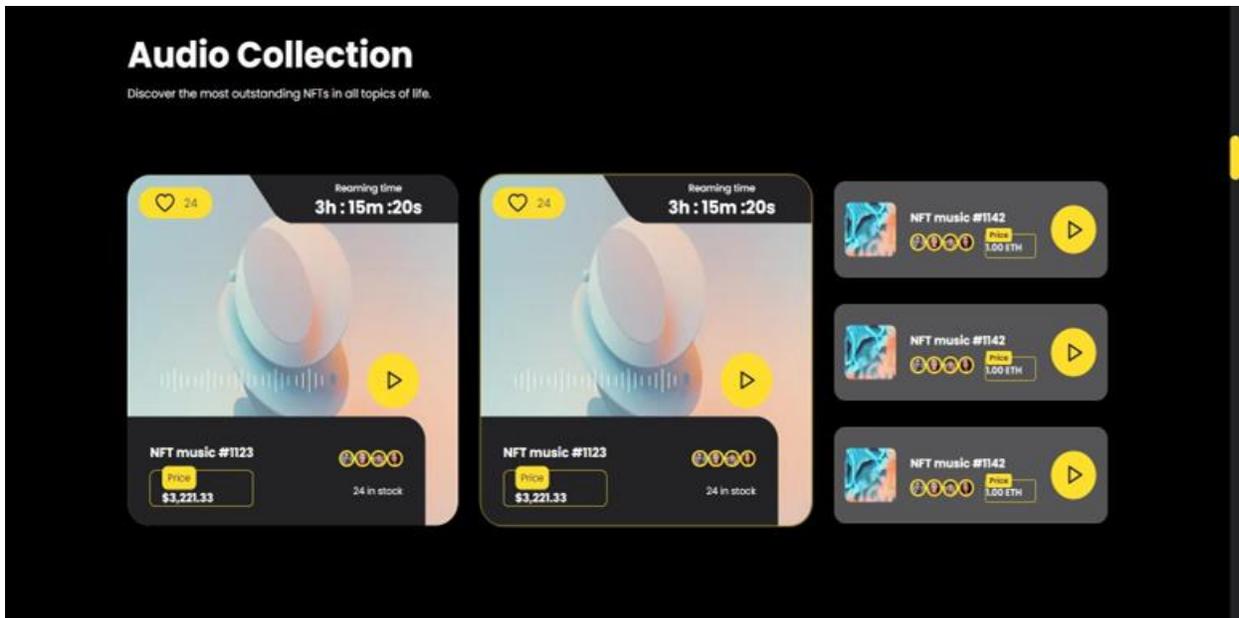
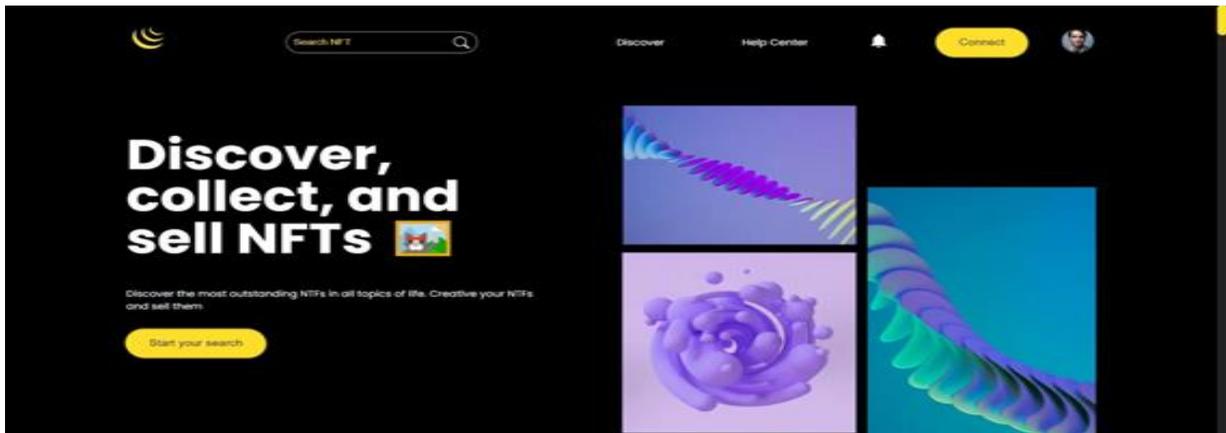
In many cases, the artist even retains the copyright ownership of their work, so they can continue to produce and sell copies. But the buyer of the NFT owns a "token" that proves they own the "original" work.

Some people compare it to buying an autographed print. Multiple NFTs can be constructed over an asset in theory, each claiming to be the "genuine" token representing an idea, picture, or object.

Output







8. INFERENCES

In the blockchain sector, Non-Fungible Token is a rapidly expanding technology. Given that not all submitted NFT artworks are viewed by online customers, virtual artists have hurried to list their works on NFT exchanges. This creates new potential for artists to commercialize their work in the digital age. In this paper, we look at cutting-edge NFT systems that have the potential to reshape the digital or virtual asset market.

We initially talked about the timeline of NFT and how it all started and scaled up in its popularity due to highly secure blockchain technology and scaled to success. Then we talked about how NFT works like creation of the asset then uploading it on the marketplace. Also, how the ownership works in case of NFTs. Then we moved on to the core components of NFTs including blockchain and smart contract. Then we discussed tokenization, the main component that helps the NFT to be unique among others. Finally we looked at some of the properties that greatly benefit NFTs like accessibility, authenticity, usability to name a few. Lastly we looked at the worth of NFTs and its value.

We hope that this report will deliver the summary about what NFT is, and how it will help the new gen artists to prove their work.

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