

NFT MART

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Abstract

Non Fungible Tokens which are commonly known as NFT's are digital items such as audios, Videos, Photographs etc. NFT's are unique cryptographic tokens that exist on a blockchain and cannot be replicated. All Non Fungible Tokens have unique identification codes and metadata that differentiate each token from each other.

NFT Mart is a marketplace that works as a public blockchain platform. This platform stores and sells the NFT's. NFT mart is a marketplace where digital collectors can buy, sell, trade and create their own tokens that represents the ownership of intangible, tangible and unique items. NFT Mart works the same as Flipkart and amazon works with the goods.

Keywords: Blockchain, Non Fungible Token, Cryptographic.

1. Introduction

- A NFT is a token we all know but there are multiple tokens in the form of files, images and collectibles which have a certain value in them which make them unique and valuable. NFTs may be created by everybody, and require few or no coding talents to create. NFTs commonly contain references to virtual documents including photos, movies, and audio. The market cost of an NFT is associated with the virtual file it references.
- The possession of an NFT as defined by way of the blockchain has no inherent felony which means, and does not necessarily provide copyright, highbrow property rights, or different prison rights over its associated digital file. An NFT no longer limits the sharing or copying of its related digital document, and does not prevent the advent of NFTs that reference identical documents.
- Research on NFTs continues to be limited, and focuses totally on technical factors, including copyright regulations additives, protocols, requirements, and favored properties, new blockchain-primarily based protocols to trace bodily goods, and the results that NFTs have on the art world, mainly as they allow to proportion secondary sale royalties with the artist. Empirical research aiming at characterizing houses of the marketplace have centered on a confined number of NFT collections, such as, CryptoKitties, Cryptopunks, and Axie, or on a unmarried NFT market, inclusive of, Decentraland or SuperRare.

2. NFT MART

NFT, abbreviated for “non-fungible tokens”, are digital assets that are representative of physical or digital creative work or intellectual property including music, digital art, games, gifs, video clips, and

more. “Non Fungible” in NFT means that each token is not exchangeable with another token, making each token a unique entity that represents a single specific object. These tokens consist of digital information in the form of media (music, video, image) the value of which can be calculated in terms of cryptocurrencies.

The NFTs are part of the Ethereum blockchain in particular but differ from Ethereum coins which are fungible, that is, exchangeable with similar types of assets. A non-fungible token is a processed data or token unit maintained on a blockchain with the help of smart contracts that is not interchangeable with other digital assets. Earlier blockchain was only used for financial and trading transactions, but now many studies have shown that blockchain technology can have far bigger applications. This is due to the fact that blockchain technology has a high level of transparency. Blockchain 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. It does not have the same properties as fungible tokens. Each bears a digital signature that prohibits NFTs from being substituted for or compared to one another hence, it is non-fungible.

Non Fungible tokens are virtual tokens that reflect possession of something inherently unique and rare, such as artwork, music, a collection, an in-game item, or real estate property, whether it is a digital or physical asset. The NFT marketplace is a platform for storing, presenting, trading, and issuing NFTs. Artists can sell their NFT artworks 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. The NFT marketplace is basically a platform that makes it simple to store and sell NFTs. These NFT tokens are generally available for purchase or can be auctioned at a set price.

Many online marketplaces provide a platform for buying and selling NFTs but some of them are more sought after than others as shown in Table I. Not all marketplaces sell the same collectibles or artwork. Thus the type of these collectibles is determined by the type of market. Mostly the marketplace sells a variety of NFTs, but each platform operates differently.

3. Existing System

NFTs are created via a technique called minting in which the information of the NFT is posted on a blockchain. At an excessive-stage, the minting process entails a brand new block being created, the facts of the NFT being established via a validator, and the records being recorded. This minting manner often involves incorporating clever contracts that assign possession and manipulate the transferability of the NFT.

As tokens are minted, they're assigned a completely unique identifier at once connected to at least one blockchain address. every token has an owner, and the possession information is publicly to be had. Even though a lot of NFTs of the identical specific item are minted, every of the tickets has a completely unique identifier and can be outstanding from each other.

4. Literature Survey

NFTs began gaining the attraction of the masses with CryptoPunks in October 2017 but became more popular since the largest art sale in history, made by Mike Winkelmann, a digital artist who sold his

work for nearly USD 70 million. The growth of NFTs has been on an upward trend since it has been getting a generous amount of attention from artists and art enthusiasts. Minting NFT is a process that transforms digital art into a part of the Ethereum Blockchain. NFTs are tokens that are “minted” after they have been created, similar to how metal coins are minted and incorporated into circulation.

Digital art is symbolized as an NFT, allowing it to be bought and sold on the market, as well as digitally tracked throughout the whole process. Earlier, NFTs were only known in a limited sphere of the blockchain community but currently have a market of their own, making up to USD 1.2 billion in sales as of December 2021. As the sales of NFTs, there are many challenges pertinent to the implementation of NFTs which needs to be taken care of. Intellectual property issues are the next significant entry in the list of NFT risks and obstacles. It is important to evaluate an individual's ownership rights to a certain NFT. It is critical to determine whether the seller genuinely possesses the NFT before making a purchase.

The growth of the digital world, as well as the number of NFT transactions, has resulted in a significant increase in cyber security and fraud risk. Fraud actors can imitate well-known NFT artists and sell counterfeit NFTs in their names. Copying of popular NFTs or false airdrops, and NFT giveaways are some of the other major non fungible token threats and issues in terms of cybersecurity and fraud. One of the most recent examples of the NFT cybersecurity concern is the theft of NFTs from Nifty Gateway users by hackers. Smart contract development and security are critical concerns in the NFT environment. Hackers recently targeted the famous Decentralized Finance (Defi) protocol Poly Network, which provides cross-chain interoperability. The NFT theft has resulted in a loss of nearly \$600 million, which puts focus on serious flaws in smart contract security. There are no clear security standards with industry-wide validation in the case of Solidity is one of the key causes that can lead to vulnerabilities in smart contracts.

The growth in the understanding of NFTs is influencing people to invest in crypto technology but it has several evidence regarding its detrimental effects on the environment. According to research conducted it has found that Ethereum is recently estimated to use 44.94 terawatt-hours of electricity per year, which is equivalent to the annual power consumption of countries such as Qatar. The NFT market observed a sudden uprising in the second half of 2020 with an NFT art selling for USD 69 million. Furthermore, the total volume of NFT sales in 2020 were USD 2.5 billion while the total sales volume of NFTs in 2021 surpassed USD 10.7 billion. This shows a significant change in the growth of NFTs over a short period. The 24-hour normal trading volume of the NFT market is USD 4 billion, while the 24-hour normal trading volume of the entire cryptographic money market is USD 341 billion. 2022 has seen a significant increase in interest in NFTs, with NFT marketplaces like CryptoPunks and OpenSea recorded the highest trading volumes in the first quarter of 2022.

NFT Marketplaces are necessary since they help creators to get close to their customers, which was not the case with web 2 e-commerce stores. Also, NFT marketplaces are mostly p2p, meaning that no one can meddle in your purchases. Although total transparency of the NFT marketplace brings the concern of data breaches, the names behind will stay anonymous and any tampering attempt will be visible. These platforms are also beneficial to new creators who need enough recognition before forming their community and also for small-time entrepreneurs.

5. Problem Statement

Due to NFTs being new and in the early phase of development and usage there are a lot of problems with NFTs. It can be cost related to experience related here in this section we will be discussing the problem in NFTs and problems in their usage.

- Excessive and blinded fees

NFT trades are continually associated with high and hidden fuel costs. To be greater unique, the Ethereum blockchain makes use of the evidence of work mechanism to pick out its price. This affects high gas charges, and that is one of the largest problems with NFT marketplace improvement nowadays.

- Poor user enjoy

For the reason that the industry is surprisingly new, NFT customers frequently want to search for diverse crypto systems and launchpads as well as undergo lengthy sign-up and verification techniques. Some platforms additionally ask customers to offer their private details such as their authorities Identification, phone quantity, and even address to create a consumer account. This creates a negative user experience and forces people to search for better answers for them.

- Lagging transactions

NFT transaction is a bit sluggish as transaction time is a lot because it's mostly done in crypto currencies we can find in cases where the user has completed the transaction and the token which he bought comes after some time.

6. Technical Components of NFT Marketplace

- Blockchain

As said by Satoshi Nakamoto, Bitcoins Employs the "Proof of Work" technique to achieve consensus on transaction data in a distributed system. A blockchain is a distributed database that maintains track of a list of data entries that are linked and secured using cryptographic methods. Any changes to the recorded data on the blockchain become immutable after it has been validated by the other nodes as it provides a secure environment for smart contract execution. And so we have used the Ethereum Blockchain platform in building NFT Marketplace.

- Smart Contract

To speed up, verify and execute digital agreements, the smart contract was introduced by Szabo. Blockchain technology has an advanced technology named Ethereum. Smart contracts enable scattered participants and unknown parties to conduct fair transactions without the need for any third party and also they provide a uniform foundation for creating applications across a wide range of areas. For consistency, the placements of states between distant nodes must stay constant. To enable the sensitive execution of transactions, most NFT marketplaces leverage smart contract-based blockchain platforms.

- Address and Transaction

The two fundamental concepts involved in cryptocurrencies are blockchain addresses and transactions. Where a blockchain address is a unique identity that allows a user to move and receive assets. It is composed of alpha-numeric characters that have been generated by a pair of public and private keys. To

transfer NFTs, the owner must show that they possess the appropriate private key and send the assets to another wallet address using a valid digital signature. This activity of transaction is performed using a bitcoin wallet and is referred to as submitting a transaction to use the ERC-777 smart contract standard.

- Data Encoding

Encoding is a process of converting data from one type to another. In the blockchain, Ethereum, hex values are utilized to encode transaction components such as function names and return values. It means these rules must be followed by actual NFT data. Data Encoding is important as when someone claims the ownership of an NFT asset, they are claiming ownership of the creator's original hex value chunk. This improves the intellectual property rights of an owner and so others can only freely copy the raw data but they cannot claim ownership of the property.

7. Creating Asset (Minting)

Minting is a process of creating digital artwork i.e NFT artwork. Here a users need to upload information about his digital asset and mint a new token. Process of minting a digital token is given as below:

1. Connect Your DApp with web3 wallet: For minting an NFT on a blockchain, here we are connecting Dapp with a web3 wallet i.e Metamask.
2. Uploading the Metadata to IPFS: Metadata involves NFT asset,title, description and its properties. We need to make sure that the metadata of each and every NFT stays forever and decentralized. Thus we are storing Metadata in IPFS.
3. Minting NFT : To mint an NFT, we take metadata ID from IPFS and use it as tokenURI.
4. Listing NFT on Sale : After the user has minted an NFT to owned one they can list them for sale. Here in our NFT Mart we have used the method of fixed price sale. wherein user will list the NFT for a fixed price, so that other users can purchase the NFT by paying the amount given in the NFT detail.
5. Buying : User can visit the NFT buying page and buy an NFT.

Following are steps to buy an NFT:-

Connect Metamask -> Select NFT to Buy -> Call Buy Function -> Receives Confirmation alert from Metamask -> NFT Bought Successfully

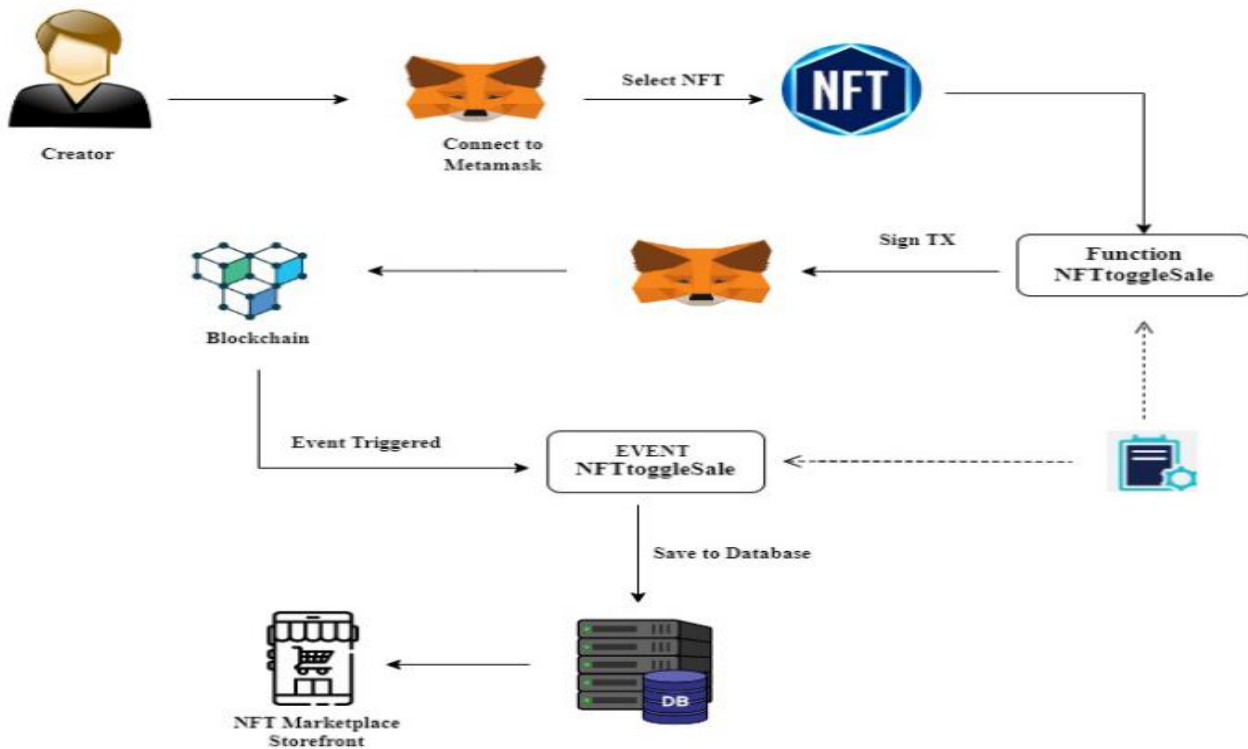


Fig 1: Architecture of NFT Mart

8. Discussion

The NFT marketplace provides improved methods of authenticity and legitimacy of ownership of assets by linking information to a single account on the blockchain. Owners of NFTs are gaining the benefits of NFTs to generate revenue through the sale of their original works with more convenience and security. Along with the advantages of NFTs, there are many challenges and risks associated with them.

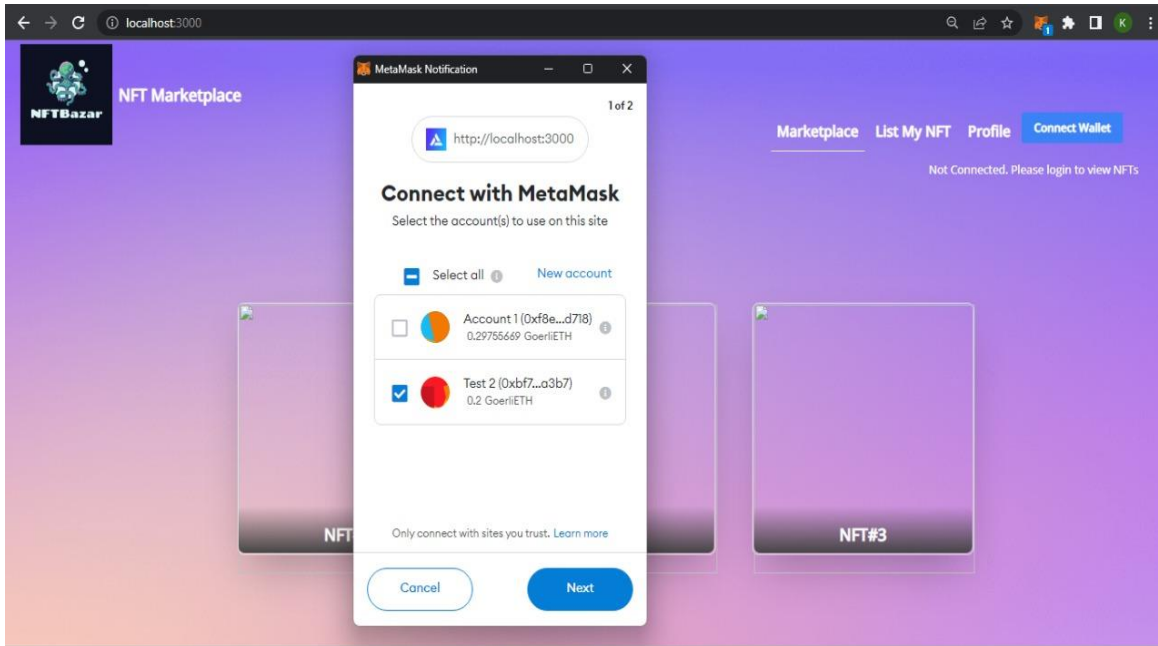
We discuss some of the ways that can be implemented to address risk in certain use cases and overcome some of the problems we have discussed earlier. Security and privacy issues are one of the most prominent risks of multiple use cases of NFTs. Since all the transactions in an NFT marketplace take place over the internet where information related to each transaction is vulnerable to unauthorized access and exploitation. To overcome such challenges and risks associated with it emerging technologies such as zero-knowledge proofs known as ZKP is a cryptographic mechanism that allows us to prove to another party specific attributes without revealing them.

Increasing use of the users in cryptocurrency has led to the introduction of many platforms to facilitate digital currency like web wallets. As all the web wallets are based on blockchain technology, they can be accessed by third parties when they are online and many of them have vulnerabilities such as phishing scams, malware, DDoS attacks, and outdated security patches which hackers can take advantage of for their benefit. So it is recommended for every user of the NFT marketplace to use more than just a web wallet. There are many such wallets like Binance, coinbase wallets which are non-browser wallets that can be used by one to store their NFTs and cryptocurrencies. As these wallets have strong privacy policies and high-security standards along with 2-factor authentication which makes it impossible for the hacker to hack such accounts.

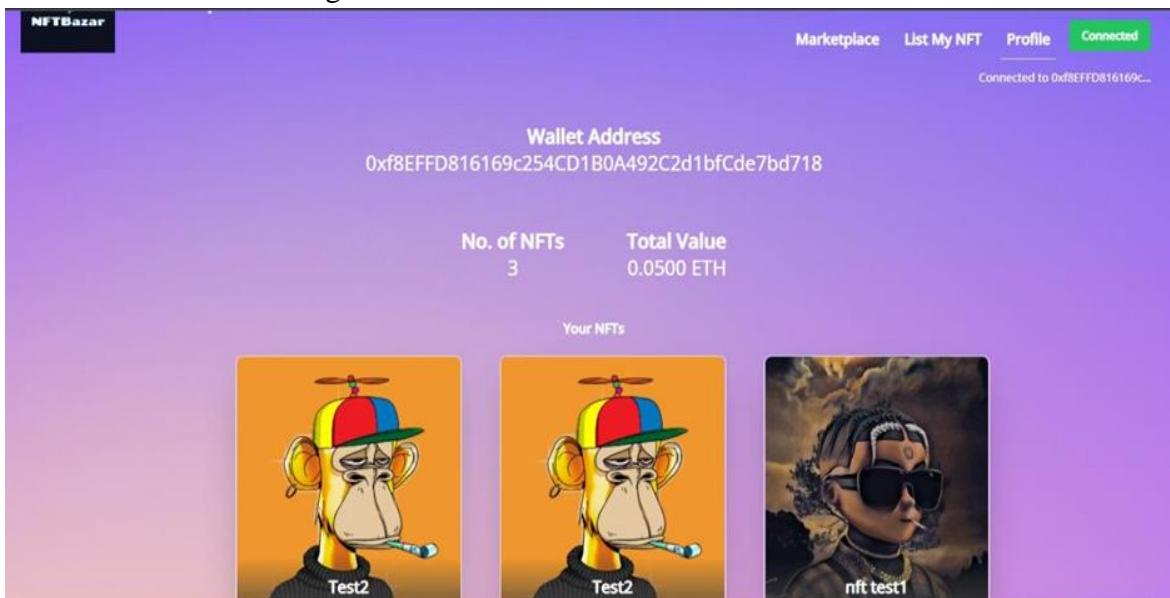
Furthermore, developers have been encouraged to use sustainable alternatives that involve SolarCoin and BitGreen rather than Ethereum Blockchain in order to decrease the environmental impact of NFTS

9. Results

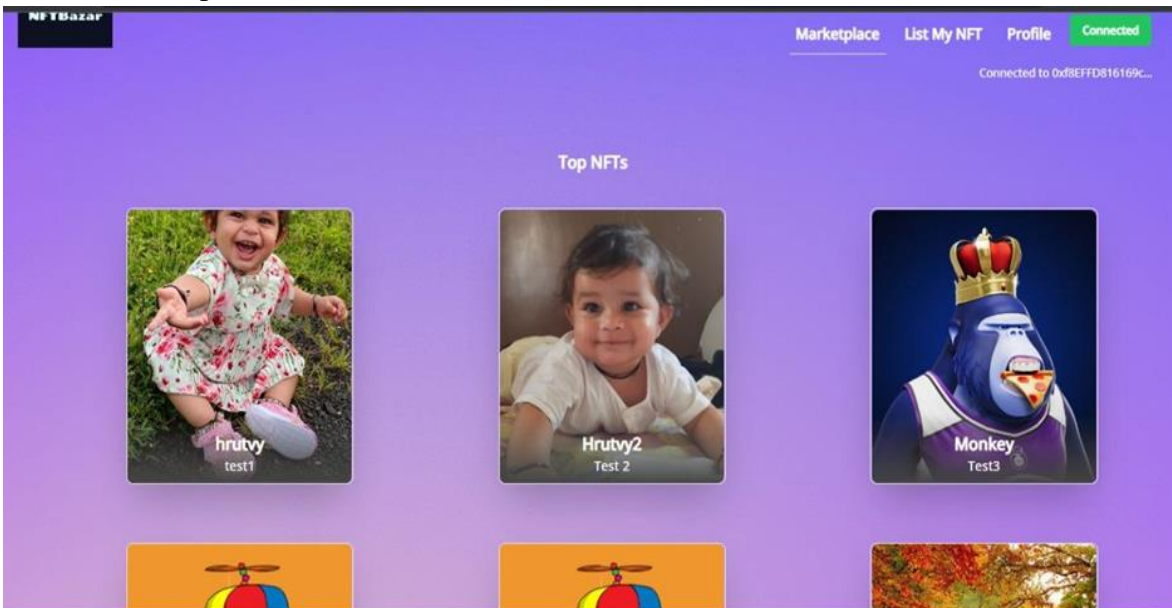
1. Connecting Metamask.



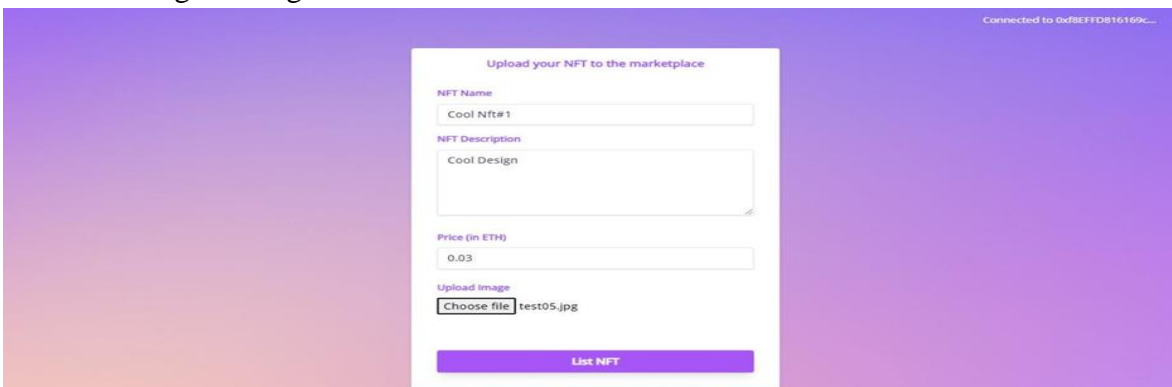
2. NFT fetched using Metamask address



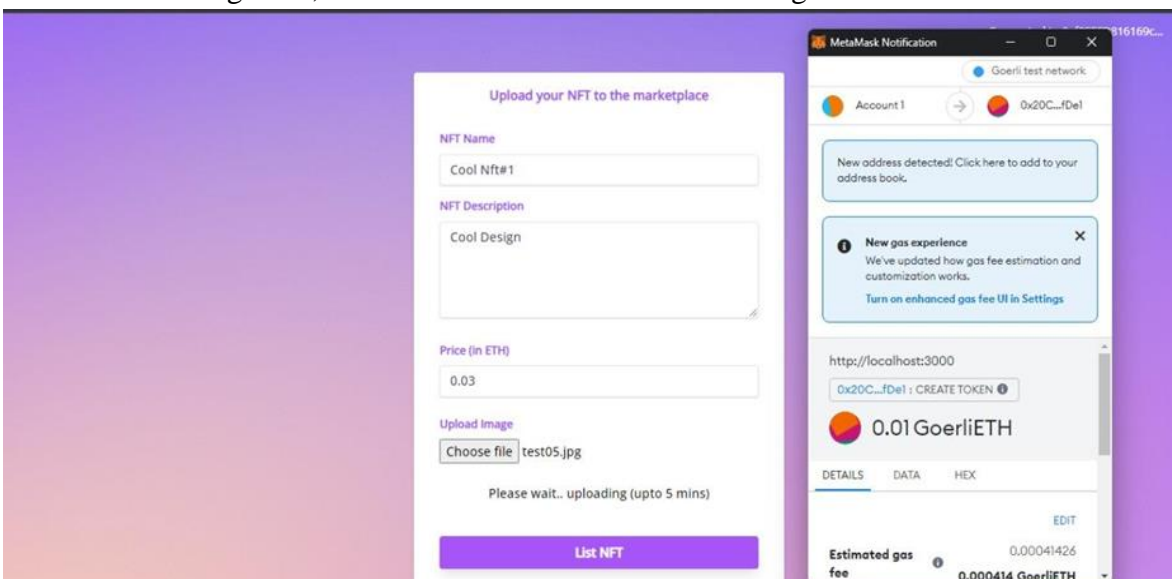
3. Market place



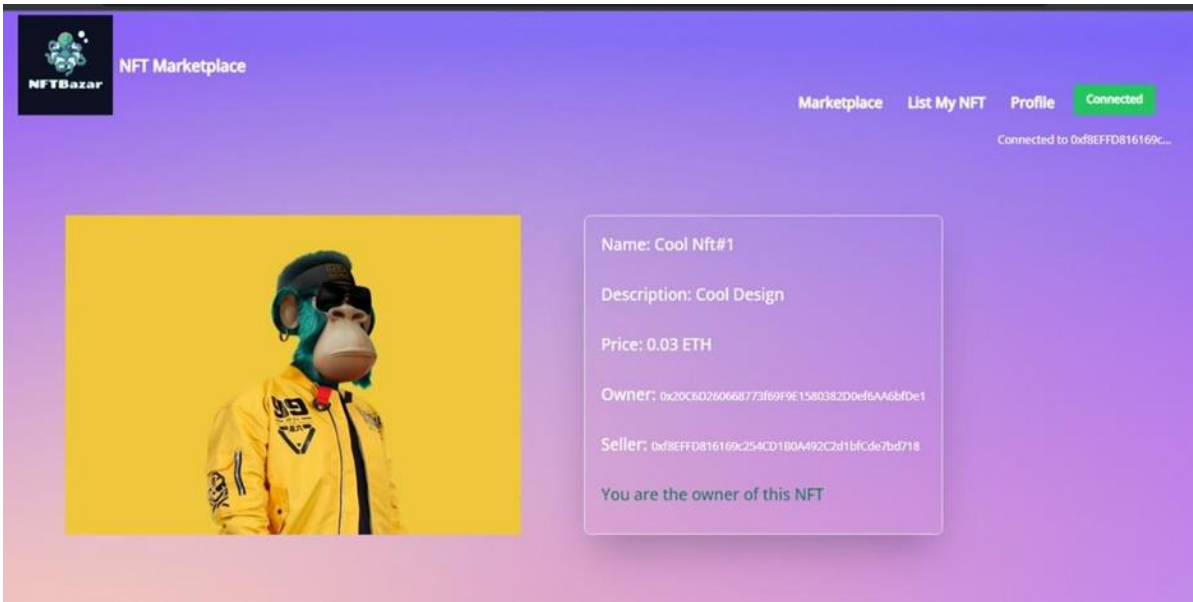
4. Listing/Minting NFT



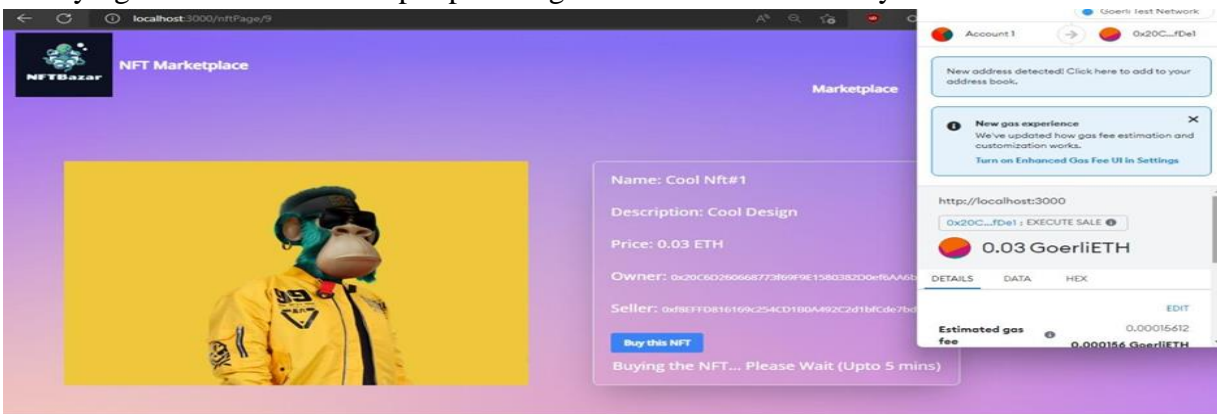
5. For Listing NFT, 0.01 ETH Will Be Asked as a Listing Fees.



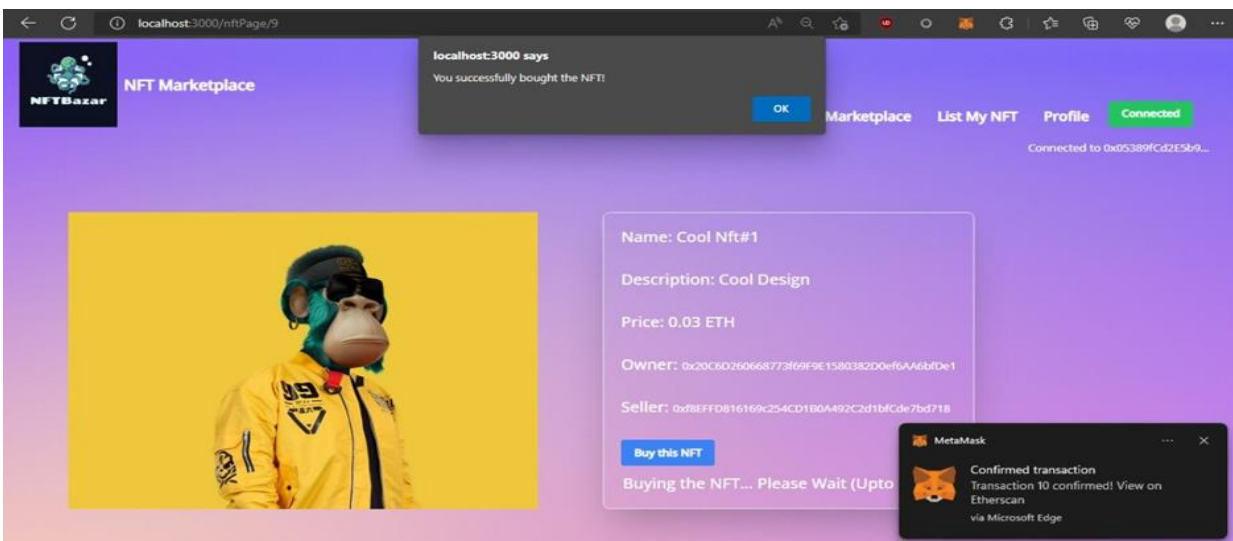
6. Owner's POV : Details Of The NFT



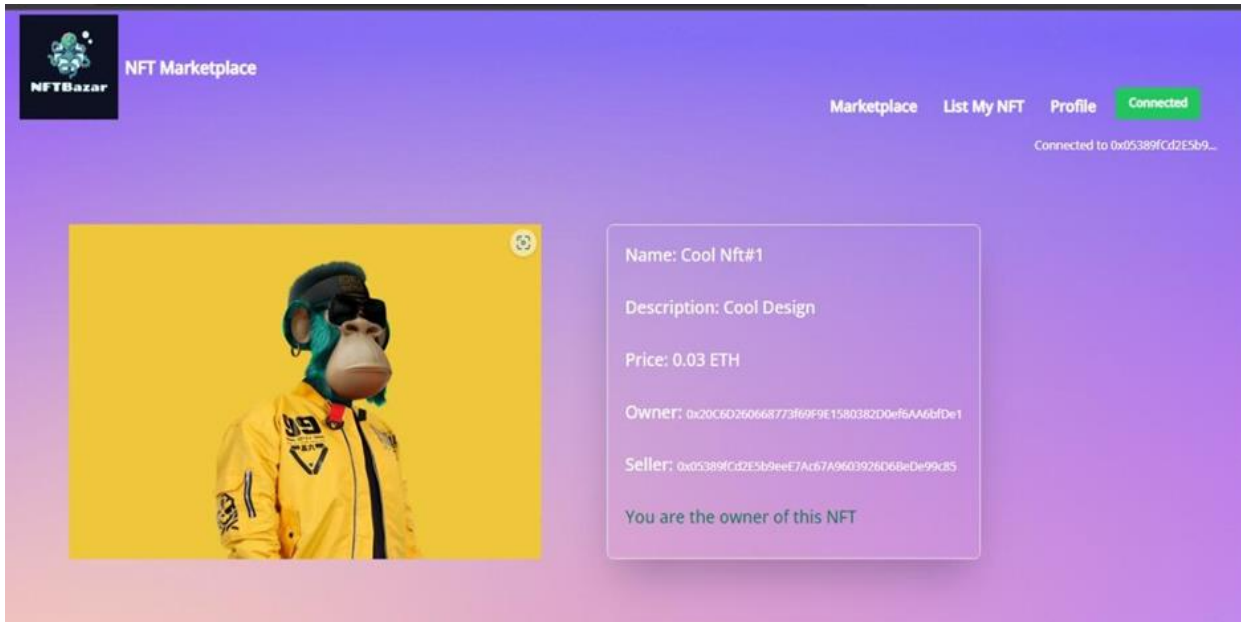
7. Buying NFT : Metamask Pop-Up Asking For Confirmation of Buy



8. Successful Transaction Of NFT



9. NFT Status After Buying The NFT



10. Conclusion

NFT Marketplace named 'NFT MART' is built on blockchain technology. More specifically it is built on Ethereum, thereby making it transparent, traceable, and secure. The characteristics of unique NFT tokens in the marketplace enabled use cases that have not been demonstrated before such as exclusive ownership of digital assets. The authenticity has been increased due to the traceability of the right of each asset. The sudden growth in the nft marketplace is due to the idea of having complete ownership of an authentic purchased digital asset such as images, gifs, videos, music, etc. NFT is not only limited to digital assets but can also be applied to physical assets by exchanging them the same as that digital system. There are a number of platforms that provide the facility of buying and selling NFTs. The marketplace has now been extended to many other domains like education, licenses, certification, fashion, and many more areas. This has increased the way to generate more revenue all across the globe. Along with all the benefits, there are many challenges faced by the owner of an NFT such as lack of standard smart contracts, uncertainties of intellection and property rights, fraud risks and transparency that violates users security and privacy rights. The solutions are yet to gain momentum along with the wider community of blockchain. So the challenges persist and these are yet to be addressed effectively instead of the massive potential of the NFTs, for which the NFT marketplace is proliferating.

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