

Block Chain Based NFT Market Place

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ABSTRACT

Blockchain is a new and groundbreaking technology that has transformed society from Web 2.0 to Web 3.0. It creates a decentralized system, moving away from centralization. One fascinating aspect of Blockchain is NFTs. NFTs are unique digital assets like art, music, videos, or games, comparable to real-world assets such as gold or stocks. They are prized for their uniqueness and can be excellent investments. This paper proposes the creation of an NFT marketplace, a decentralized app (dApp) for trading NFTs. It explores concepts like smart contracts, wallets, and token standards.

The system design includes features like minting, listing, buying, and selling NFTs. It analyzes the benefits of NFTs, such as immutability and security, as well as limitations like gas fees and legal concerns, to assess the feasibility of developing such an application.

Keywords: NFT, Blockchain, Web3, Decentralized Applications (Dapps).

INTRODUCTION

Blockchain-based NFT (Non-Fungible Token) marketplaces have gained significant popularity in recent years. NFTs are unique digital assets that can represent ownership or proof of authenticity for various types of digital content. These marketplaces provide a platform for creators and collectors to buy, sell, and trade NFTs securely and transparently. From a technical point of view, NFTs are special pieces of data stored securely on a blockchain. This means they can't be changed, destroyed, or copied easily.

The blockchain verifies NFTs, giving them extra value. NFTs are a special type of digital asset on the blockchain that can't be swapped with others like regular cryptocurrencies. They prove who owns something. Each NFT is one-of-a-kind and can't be made again. Examples of NFTs include images, files, cartoons, virtual real estate, pets, videos, and trading cards. They create a unique space for artists and creators to show their work or collections, letting new people join the digital business world. This change brings opportunities for artists to make and earn money from their work, and it gives collectors clear information about what they're buying and where it comes from.

In the past, people didn't always see technology and digitalization as important for the arts industry. But now, that's changing. Many content creators, artists, and others from different industries are making waves with Non-Fungible Token projects. They're moving away from old-fashioned business models by embracing blockchain technology, which offers powerful tools and new features. As people discover more about tokens and tokenization, they're finding more ways to use this technology for business. This shift means users don't have to give up control of their data anymore. New solutions are emerging that let users keep control of their data and avoid the problems often seen in centralized systems.

PROBLEM STATEMENT

Develop a secure and efficient platform for creating, trading, and managing NFTs (Non-Fungible Tokens) in a decentralized manner, ensuring data integrity and provenance. The system should address scalability, energy consumption, and environmental concerns associated with NFTs. Additionally, it must provide a user-friendly interface for artists, collectors, and investors while guaranteeing copyright protection and royalty distribution.

SYSTEM DESIGN

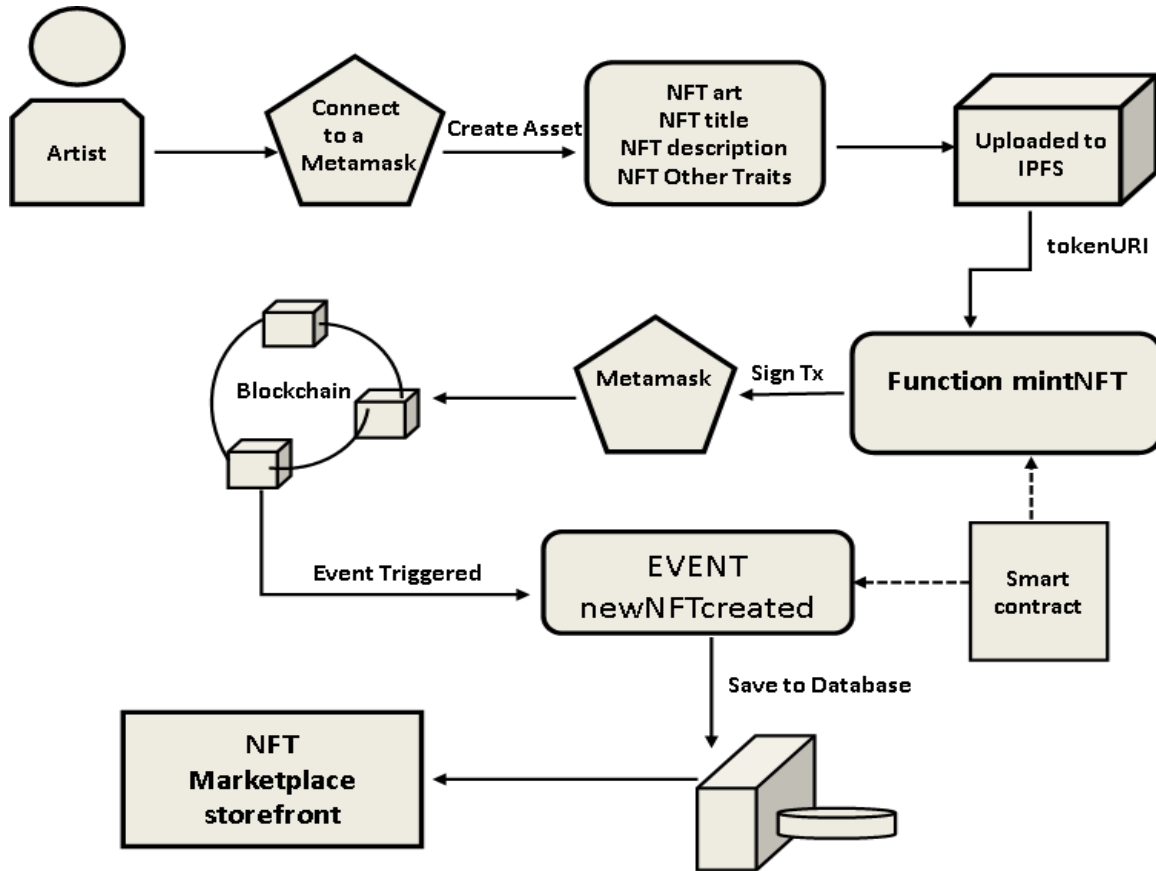


Fig. 1 System Design

METHODOLOGY

Blockchain: Blockchain is a special kind of technology that keeps records securely and transparently. Instead of storing information in one place, like a traditional database, blockchain spreads it across many computers. Each piece of information, or "block," is linked to the next one, forming a "chain." This makes it extremely hard to change any information without everyone noticing. Blockchain is famous for being the technology behind cryptocurrencies like Bitcoin, but its uses go beyond that. It's being explored for things like secure voting, transparent supply chains, and even digital art ownership.

IPFS: IPFS, or the Interplanetary File System, is a clever way to store and share files on the internet. Instead of storing files in one place like traditional systems, IPFS breaks files into small pieces and stores them on lots of different computers all around the world. When you want to access a file, IPFS finds all those pieces and puts them together for you. This makes it faster and more reliable, and it means files can stay available even if some computers go offline. It's like having a big, global library where anyone can find and share files easily.

Smart Contract: A smart contract is like a digital agreement that automatically executes and enforces itself when certain conditions are met. It's like a computer program that runs on a blockchain. Instead of needing a middleman, like a lawyer or a bank, to make sure everyone sticks to the agreement, the smart contract does it all by itself. This can include things like transferring money or assets, releasing funds when a job is done, or even managing complex business agreements. Smart contracts help make transactions faster, cheaper, and more secure because they're powered by blockchain technology.

Ganache: Ganache is a popular personal blockchain for Ethereum development. It allows developers to create and test Ethereum applications, smart contracts, and decentralized applications (DApps) in a controlled environment. Ganache provides a local blockchain that developers can use for testing without incurring any costs or interacting with the main Ethereum network. It is commonly used for development, debugging, and testing purposes. We utilized the Ganache

Ethereum network to conduct transactions. Ganache provided us with a private key that we inserted into our MetaMask wallet, thereby connecting MetaMask to the Ethereum network.

Metamask: MetaMask is a cryptocurrency wallet and a gateway to blockchain applications, primarily focused on the Ethereum blockchain. It is a browser extension that enables users to interact with decentralized applications (DApps) directly from their web browser. MetaMask allows users to manage their Ethereum accounts, store Ethereum-based tokens, and securely interact with Ethereum smart contracts.

With Meta Mask, users can:

1. Create and manage Ethereum accounts.
2. Send and receive Ethereum and Ethereum-based tokens.
3. Interact with decentralized applications (DApps) directly from their browser.
4. Sign transactions securely.
5. Connect to various Ethereum networks, including the main Ethereum network, test networks, and custom networks.

Solidity: Solidity is a high-level programming language used for writing smart contracts on blockchain platforms, with Ethereum being the primary focus. It's designed to enable the creation of decentralized applications (DApps) and smart contracts that run on the Ethereum Virtual Machine (EVM). Solidity is statically typed and supports inheritance, libraries, and complex user-defined types. It draws inspiration from languages like JavaScript and C++, making it relatively easy for developers to learn and use. Solidity code is compiled into bytecode, which is then executed on the Ethereum network, enabling the automation of trustless transactions and the execution of complex logic in a transparent and decentralized manner.

DATA FLOW DIAGRAM

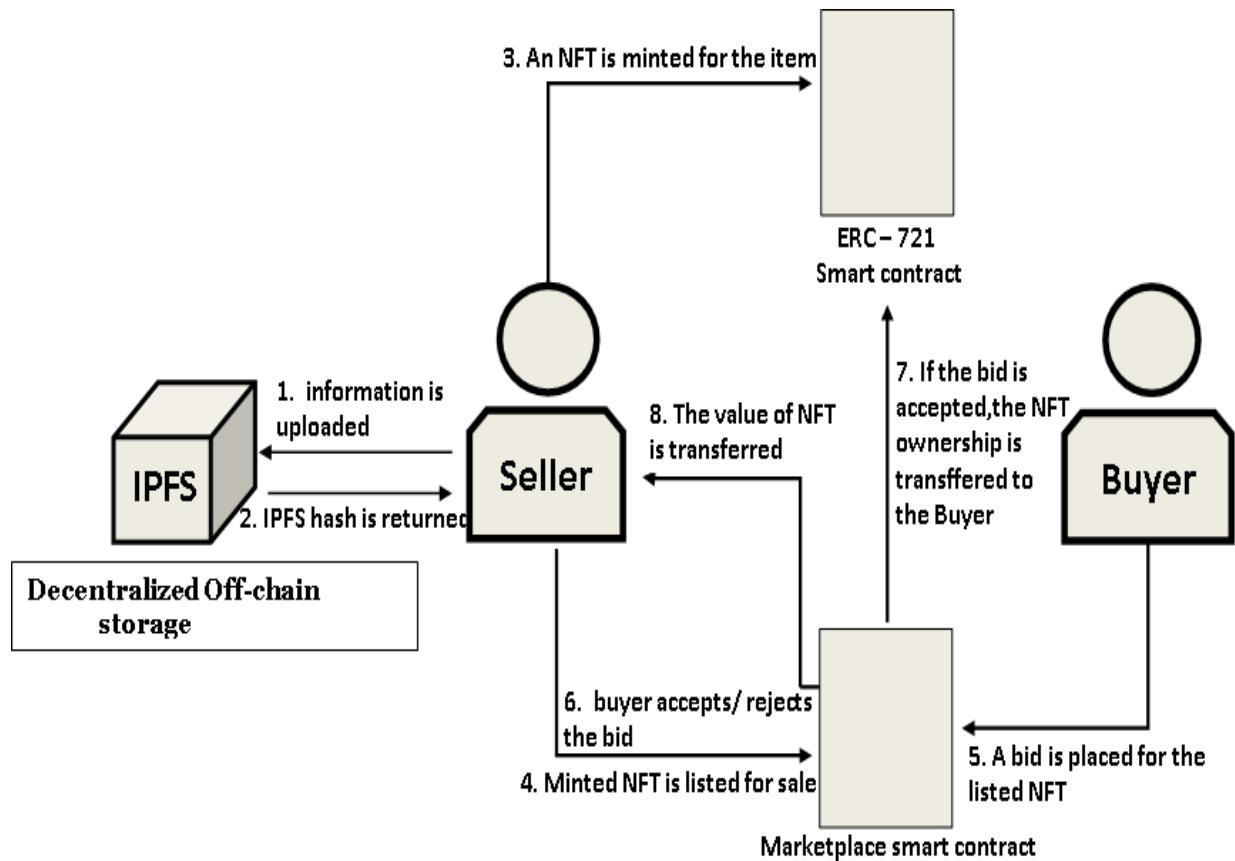


Fig. 2 Data Flow Diagram

RESULT

Home Page: Welcome to my homepage, where you'll find our NFT marketplace, a List of NFTs, profiles, and connections. In the NFT marketplace, you can browse all listed NFTs. The 'List My NFTs' section allows you to list your NFTs, while the profile displays all NFTs owned by the current account holder. The 'Connected' section shows the currently connected account address.

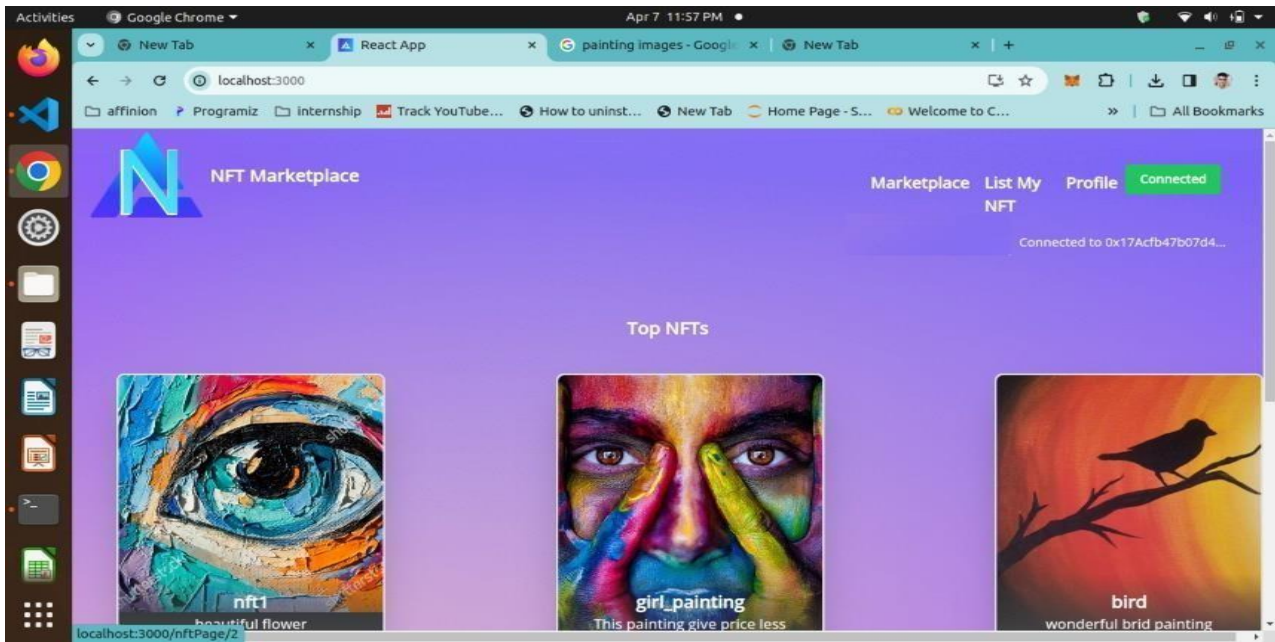


Fig. 3 Home Page

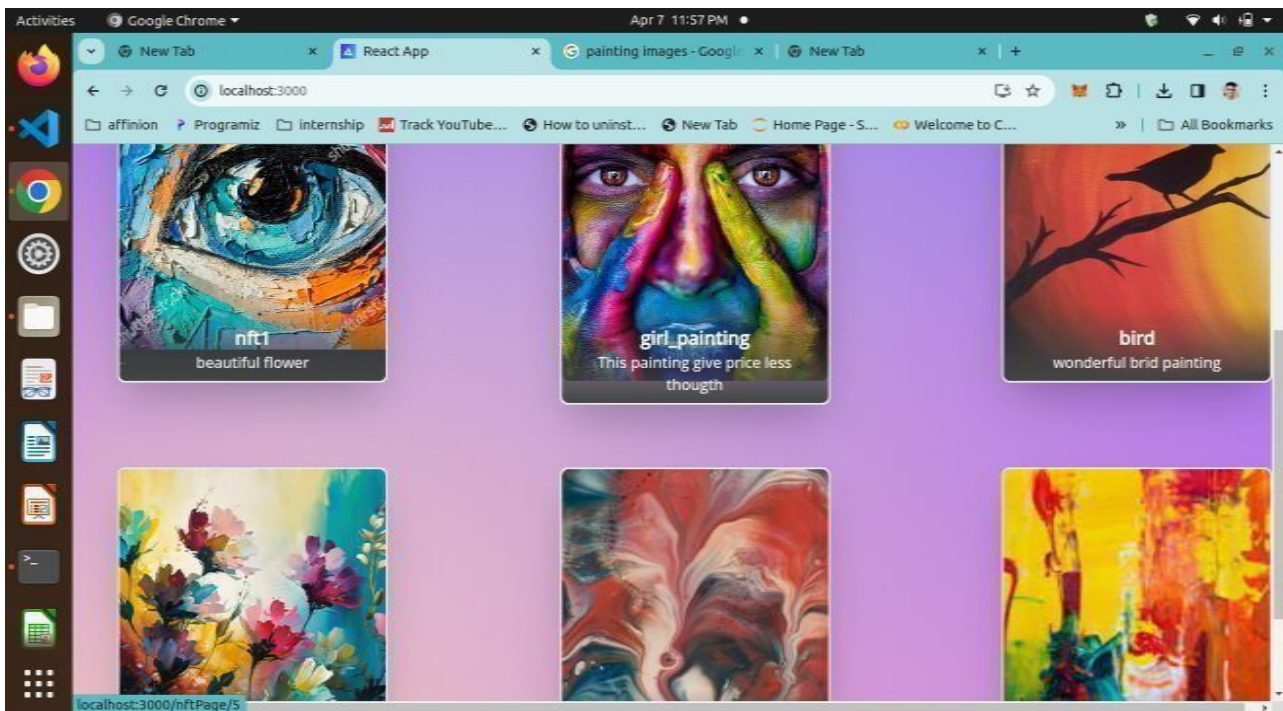


Fig. 4 NFT'S On Home Page

Ganache: We used the Ganache Ethereum network for conducting transactions. Ganache provided us with a private key, which we inserted into the MetaMask wallet. In MetaMask, we added the account and imported the address. By doing this, we connected MetaMask to the Ethereum network.

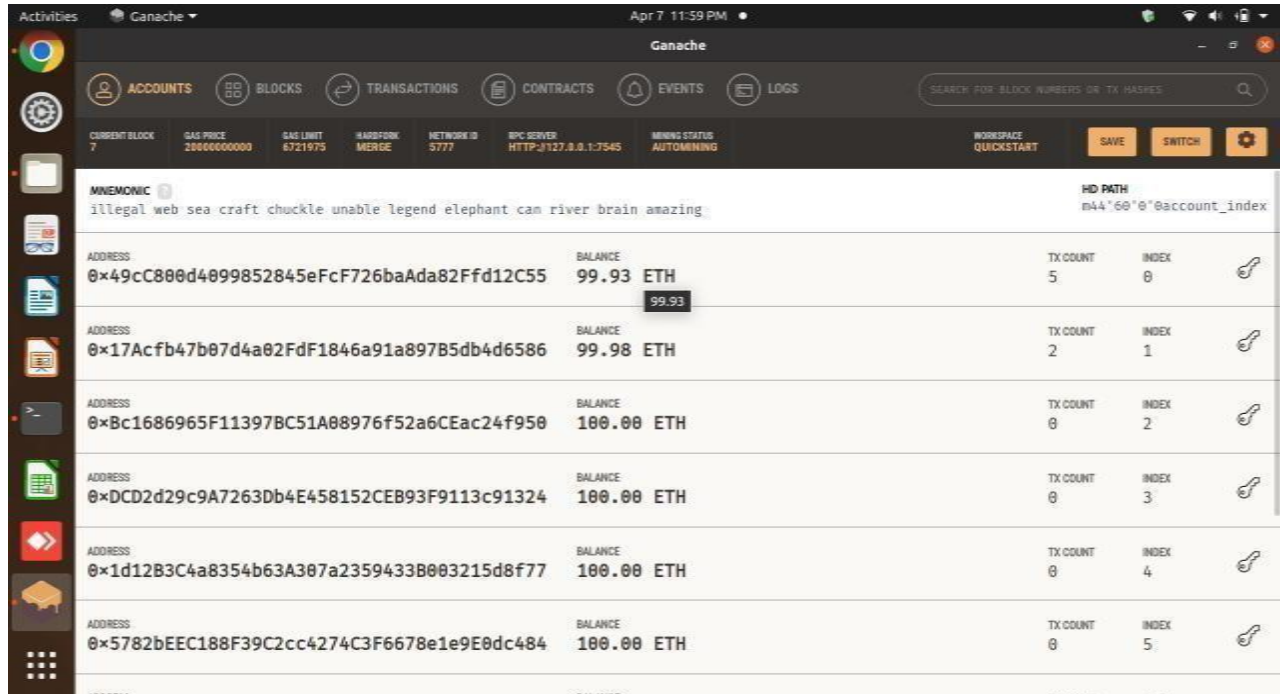


Fig. 5 Ganache Network

Metamask: MetaMask provide us interface to create and manage account, Send and receive Ethereum-based tokens and interact with decentralized applications.

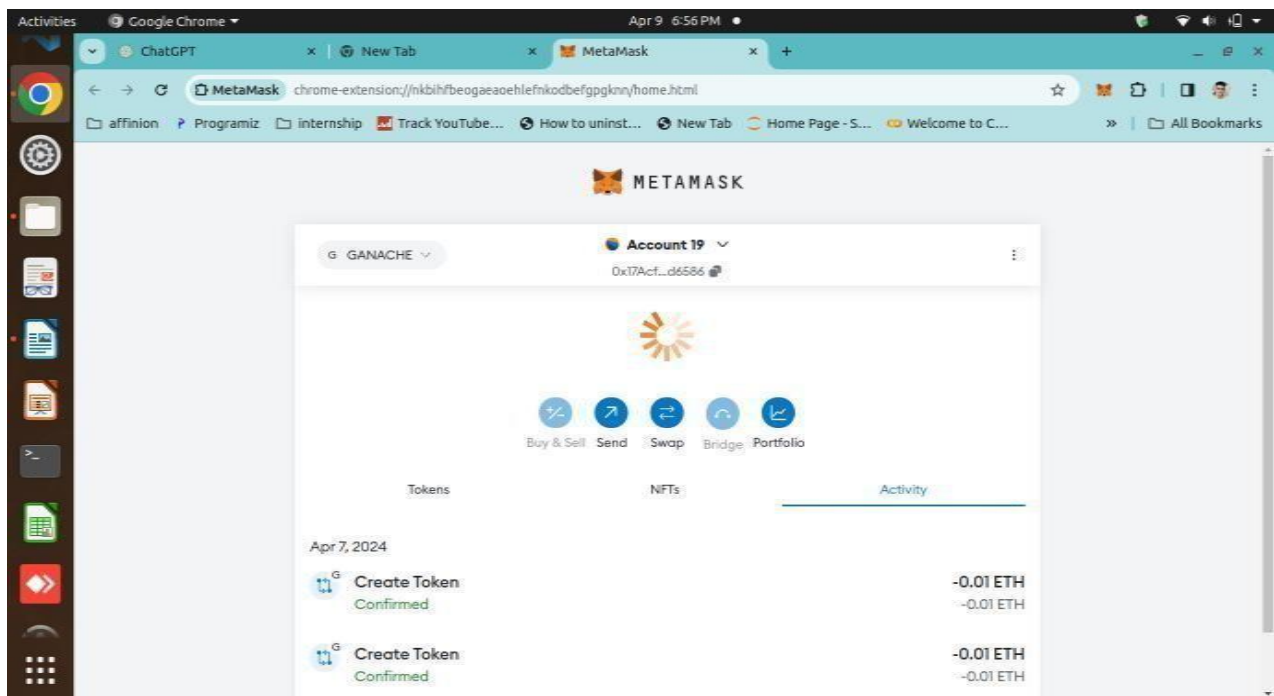


Fig. 6 Metamask

Buy:

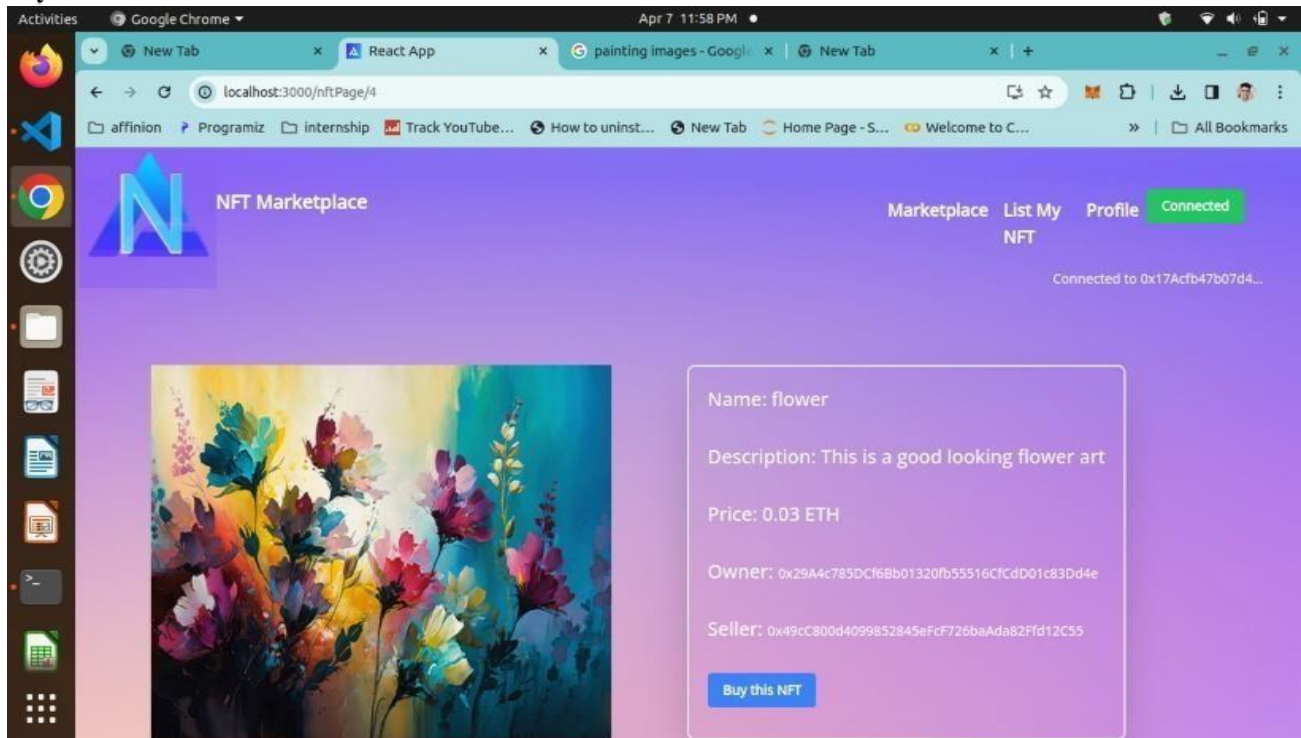


Fig. 7 Buy NFT's

My NFTs:

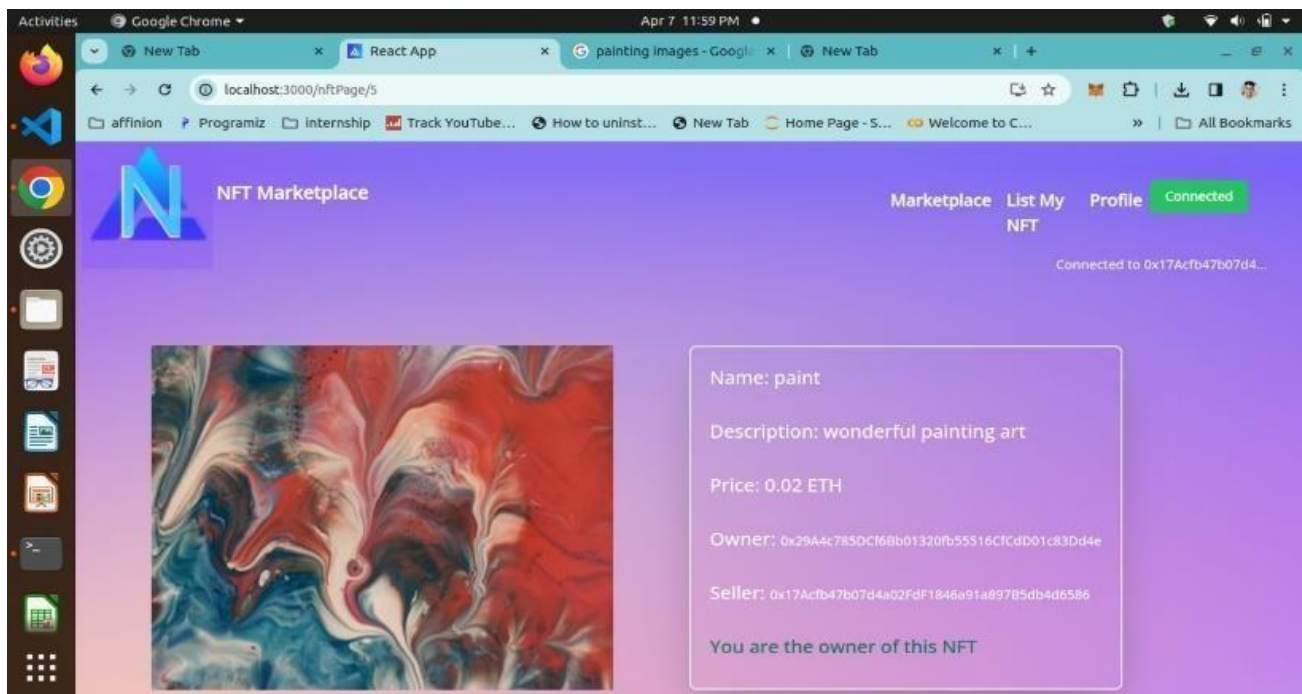


Fig. 8 Show Ownership of NFT's

CONCLUSION

The emergence of NFT marketplaces powered by blockchain technology represents a significant step forward in the digital economy. These marketplaces offer a unique opportunity for artists, creators, and collectors to engage in a decentralized ecosystem where ownership and authenticity are transparently verified. By leveraging the immutable nature of blockchain, NFT marketplaces ensure the integrity of digital assets, providing creators with new avenues for monetization and empowering collectors with a sense of trust and provenance.

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