Crafted Canvas - an art marketplace

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Abstract— This paper presents a blockchain-based marketplace designed for selling a wide variety of artworks created by artists using non-fungible tokens (NFTs). The proposed system allows users to buy and sell artist artwork with Ethereum, a decentralized cryptocurrency platform. The system also provides a website interface that displays the available artworks, their prices, and their owners. As a result of this research, a supportive and inclusive environment is necessary to promote digital art enthusiasts and enrich the creative landscape, thereby improving artistic endeavors. The system leverages the advantages of NFTs, such as uniqueness, scarcity, verifiability, and security, to create a novel and innovative application of blockchain technology. An overview of the system's design, implementation, challenges, and opportunities is presented in this paper. Additionally, the paper discusses the implications of the system and the direction it will take regarding NFTs and digital marketing trends and developments.

Keywords—NFTs, Artist, Blockchain, Ethereum, artworks.

I. INTRODUCTION

Blockchain technology has become a game-changing paradigm for distributed and decentralized applications, including digital identification, smart contracts, and cryptocurrency. Without the need for a reliable middleman, blockchain technology makes it possible to create an immutable, transparent, and safe ledger that records data and transactions. The representation of distinct and limited digital assets using non-fungible tokens (NFTs) is one of the most exciting uses of blockchain technology.

NFTs are a type of cryptographic token that are indivisible, irreplaceable, and verifiable on the blockchain. NFTs can be used to represent any form of tangible or digital asset
, such as art, music, collectibles, gaming items, or real estate NFTs have several advantages over traditional digital assets, such as:

• Uniqueness: Each NFT has a unique identifier and metadata that distinguish it from other tokens and assets
• Scarcity: The supply and availability of NFTs are determined by the creator or the underlying protocol, which can create artificial scarcity and increase the value of the assets.
• Verifiability: The ownership and provenance of NFTs can be easily traced and verified on the blockchain, which reduces the risk of fraud and counterfeiting.
• Security: NFTs are stored and transferred on the blockchain, which provides a high level of security and immutability for the assets.
• Interoperability: NFTs can be compatible with different platforms and standards, such as ERC-721 and ERC-1155, which enable cross-chain and cross platform transactions and interactions.

In the contemporary era, the fusion of Blockchain technology and art has given rise to a dynamic digital landscape that continues to revolutionize the way we create, experience, and interact with artistic content. Digital spaces have become pivotal arenas for artistic expression, providing a platform for artists to push boundaries, experiment with new mediums, and reach a global audience like never before. The idea of user-centric design, a philosophy that prioritizes user demands and experiences in platform development, is at the core of this evolution. It is impossible to overestimate the importance of user-centric design in forming digital creative platforms. By prioritizing usability, accessibility, and user satisfaction, designers and developers can create immersive and engaging experiences that resonate with audiences on a profound level. CraftedCanvas, a leading digital art platform, serves as a prime example of how user-centric design principles can elevate the creative process and empower artists to realize their vision in a digital space. As we delve into the case study of CraftedCanvas, we will explore how the platform seamlessly integrates technology and art to provide a holistic and enriching experience for users. From intuitive interfaces to collaborative features, CraftedCanvas is the epitome of user-centric design, encouraging creativity and a sense of community among its users. We can learn a lot about the

transformative potential of user-centric design in igniting artistic activities in the digital sphere by looking at creative approaches to digital art and user engagement.

The main contributions of our paper are:

- We design and implement a blockchain-based marketplace using NFTs, which enables users to buy and sell artworks of artist using Ethereum.
- We provide a website interface that allows users to view and purchase different artworks with Ethereum.
- We evaluate the performance and usability of our system, as well as the challenges and opportunities it faces.

II. LITERATURE REVIEW

The project that investigates the use of non-fungible tokens (NFTs) on the Ethereum blockchain is presented in this paper. NFTs are distinct and indivisible digital assets that can stand in for different kinds of artwork, collectibles, and ownership rights. The project shows how to set up and implement the web interface and smart contracts, as well as how to produce, purchase, sell, and trade NFTs using the ERC721 token standard. The potential advantages and difficulties of utilizing NFTs as a novel digital economy model are also covered in the project [1].

In light of the unreliable broadband market, this study examines the issue of optical access network sharing, where multiple operators compete for the same network resources. The paper proposes a novel distributed market scheme that leverages permissioned blockchain technology to enable secure and fair capacity allocation among the operators. A smart contract implementation utilizing the Hyperledger Fabric platform is also presented in the study, along with an assessment of its scalability and performance [2].

The project described in this paper is to provide a safe and user-friendly NFT trading platform. On the blockchain, non-fungible tokens, or NFTs, stand in for distinct digital assets. The project allows users to build, purchase, sell, and trade NFTs using cryptocurrencies by utilizing a variety of technologies, including Web3.js, MetaMask, and Solidity. Additionally, the project aims to inform the public about the advantages and difficulties of NFTs as a novel digital economy [3].

This paper explores the use of blockchain and distributed ledger technologies (DLT) for enabling trust and transparency in 6G network sharing among multiple stakeholders. The paper proposes two solutions based on blockchain: a marketplace and an auction, and uses IOTA Tangle and IPFS to address the transaction and gas costs issues of Ethereum. The paper also evaluates the performance and scalability of the proposed solutions through emulation experiments and compares them with the traditional methods of inter-provider agreements. The paper shows that the proposed solutions offer faster, cheaper, and more flexible network sharing options for 6G users [4].

Non-fungible tokens (NFTs), a new type of digital asset that is distinct and indivisible, are presented in this study.
The paper discusses the history, features, applications, and challenges of NFTs, and how they can transform the art world and the virtual reality domain. The paper also explains how to create, buy, sell, and use NFTs, and how they can enable new forms of blockchain-based innovation and collaboration [5].

This paper analyzes the virtual wearables market in Decentraland, a blockchain-based Metaverse project that allows users to own and customize their avatars. The paper collects and examines data on the publication, minting, and sales of wearables on the platform, and reveals that most wearables are used for marketing purposes rather than for profit. The paper also discusses the implications of this finding for the future of virtual wearable NFTs [6].

This study investigates how gamified software engineering may be used to solve cost-effective and human-centered blockchain system problems. Lack of incentive and trust are two major issues in blockchain decentralized applications and development, according to the report, which also examines the state of the art in gamification and blockchain technology. In order to improve blockchain participants' motivation and confidence, the article recommends a prototype gamified model and makes recommendations for future research and implementations in this area [7].

This study explores how machine learning methods may be applied to enhance the usefulness and functionality of blockchain-based non-fungible tokens (NFTs). Based on singular value decomposition (SVD), a technique that breaks down an image into a

collection of matrices, the research suggests a novel way to create and store NFTs.
The paper demonstrates how this method can reduce the storage cost and increase the verifiability of NFTs, as well as enable the creation of composite NFTs with different levels of privacy and complexity. Additionally, the paper discusses the challenges and opportunities of using this method for different NFT applications [8].

A blockchain-based integrated trading system called ArtChain tackles important issues facing the art business, like authenticity verification, provenance tracking, and transparency. Through the utilization of blockchain's built-in characteristics, ArtChain guarantees transaction records that are tamper-proof and privacy-preserving, offering a transparent and safe environment for the trading of art. The software provides real-time artwork tracing, safeguarding against counterfeit concerns and ensuring provenance and ownership through unchangeable digital records. With ArtChain, the art market has a novel solution that fosters an open, transparent atmosphere for investors and artists alike[9].

LBRY, a decentralized content marketplace powered by blockchain technology, is presented in the study to solve problems with peer-to-peer networks like BitTorrent and centralized websites like YouTube and Amazon. Users may locate, access, publish, host, and pay for information in an open, community-controlled ecosystem with LBRY. In order to provide transparent metadata management and content discovery, the platform implements a novel content naming strategy and leverages blockchain to build a decentralized ledger. This method improves user experience and control by providing a monetizable, user-friendly, and censorship-resistant substitute for digital content distribution[10].

III. METHODOLOGY

The platform facilitates the buying and selling of various forms of digital artwork using NFTs. Artists such as poets, fashion designers, photographers, and painters can tokenize their works and sell them as NFTs. Buyers purchase these unique tokens using Ethereum, ensuring authenticity and ownership.

User Interaction Features:

- Commenting System: Users can leave comments on individual artworks, fostering engagement between artists and buyers.
- Image Display: Each artwork is displayed in image format. The platform supports multiple image types, allowing for a variety of artistic expressions.

NFT (Non-Fungible Token): NFTs are used to certify ownership and authenticity of the digital artworks. Each NFT represents a unique artwork, such as an image, poetry, fashion design, or photograph. These NFTs cannot be duplicated or replaced, preserving the uniqueness of each piece.

Buying and Selling Process:

- Selling: Artists or creators can mint their artwork as NFTs, which are then listed on the marketplace under the appropriate category.
- Buying: Users can purchase these NFTs using Ethereum, gaining ownership of the digital art. The ownership is transferred securely through blockchain technology.
- Ethereum: All transactions occur using Ethereum cryptocurrency, ensuring secure and decentralized handling of payments.

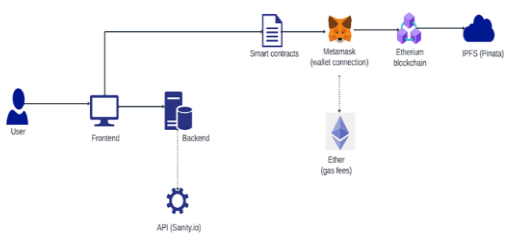
Smart Contracts: Smart contracts handle the transactions between buyers and sellers. The Ethereum blockchain provides the platform for these contracts to be written in Solidity . The ERC721 standard is used to ensure each NFT is unique and cannot be replicated or subdivided.

Blockchain Integration (Ethereum): The NFT marketplace is powered by Ethereum, a decentralized open-source blockchain. It allows users to securely interact with the smart contracts and trade NFTs.

The Technology stack used are:

- Solidity
- Hardhat
- Ethereum
- JavaScript, HTML, CSS
- Sanity.io
- MetaMask

IV. SYSTEM ARCHITECTURE



V. RESULTS AND DISCUSSION

In the result view, there are two different models which are integrated with each other, the first one is a user interface specially for artist to show their different type of artworks and to receive appropriate feedback. The second one is NFT marketplace which is responsible for creating, purchasing and selling the images which are converted to the NFTs.

Fig.1. Home Page

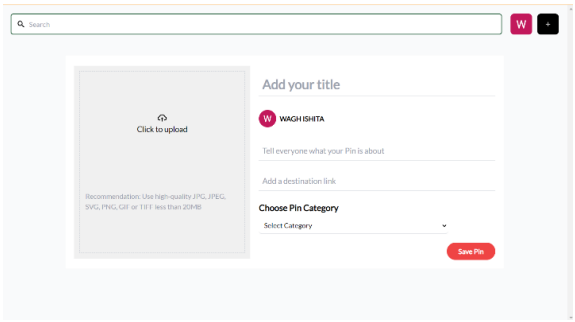


Fig.2. Pin creation

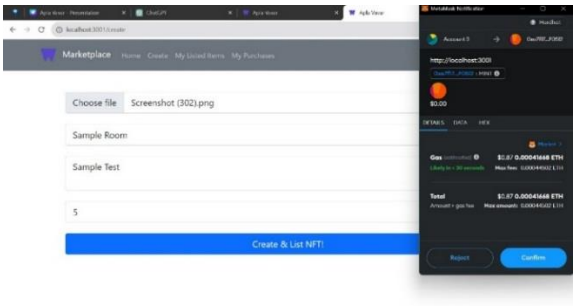


Fig. 3. Metamask Transaction Confirmation

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