



Decentralized Property Listings and Marketplace Using Blockchain-Based Platform

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Abstract: In our research we aim to revolutionize property transactions by leveraging blockchain technology and Non-Fungible Tokens (NFTs) to create a decentralized property listing and marketplace. Traditional real estate transactions often involve multiple intermediaries, leading to inefficiencies and increased costs. By introducing blockchain technology, this paper seeks to streamline the buying and selling process, enhancing transparency and reducing transaction costs. In this decentralized marketplace, sellers initiate the process by listing their properties on the platform, which are then tokenized into NFTs, ensuring unique ownership rights and immutability on the blockchain. The NFTs are made available for purchase on the decentralized marketplace, enabling buyers to acquire properties directly without intermediaries. Participation in the marketplace requires buyers to have a MetaMask account linked to the platform, providing a secure cryptocurrency wallet and interface for interacting with decentralized applications. Facilitating property transactions are smart contracts, which automate and enforce the terms of the agreement encoded directly into the blockchain, ensuring secure and transparent ownership transfers. By decentralizing the property listing and marketplace, this paper aims to enhance transparency, reduce the risk of fraud, and lower barriers to entry for both buyers and sellers, offering a secure and efficient alternative to traditional real estate transactions and unlocking new opportunities within the global property market..

Keywords: NFT, Blockchain, Smart Contract, Real Estate

I. INTRODUCTION

Blockchain technology, recognized as a transformative force in the digital realm, operates as a decentralized ledger system ensuring transparent and secure transactions across a network of computers. By obviating the necessity for intermediaries, blockchain instills trust and enhances efficiency across diverse industries [1]. Non-Fungible Tokens (NFTs) have recently emerged as distinctive digital assets, leveraging blockchain's capabilities to authenticate and represent ownership of digital and physical assets. Unlike cryptocurrencies, NFTs are indivisible and non-interchangeable, rendering them ideal for tokenizing real-world assets, digital art, and collectibles.

The contemporary real estate market grapples with numerous challenges, characterized by intermediaries, opacity, and protracted processes. Conventional property transactions entail multiple intermediaries and convoluted paperwork, resulting in inefficiencies and inflated transaction costs. In contrast, blockchain technology presents a promising solution to revolutionize the real estate industry by introducing transparency, efficiency, and accessibility [2].

This research paper explores the implementation of a decentralized property listings and marketplace using blockchain technology, delineated into three pivotal phases: minting and verifying property, listing properties, and transferring ownership and transactions. By tokenizing real-world assets and leveraging smart contracts, this platform aims to streamline property transactions, enhance transparency, and mitigate fraud. Through a comprehensive examination of each phase, this paper seeks to elucidate the transformative potential of blockchain technology in redefining the landscape of property ownership and transactions.

The implementation of our platform using blockchain will leverage the capabilities of smart contracts and Non-Fungible Tokens (NFTs) to revolutionize the real estate marketplace. Smart contracts, self-executing contracts with the terms of the agreement directly written into code, will automate and streamline property transactions. They will facilitate seamless and transparent interactions between buyers and sellers by executing predefined conditions without the need for intermediaries, reducing the risk of disputes and minimizing transactional costs.

Additionally, the integration of NFTs will play a pivotal role in tokenizing real-world assets within our platform. NFTs, as unique digital representations of assets, will authenticate and securely store ownership information for properties on the blockchain. This will enable fractional ownership, allowing investors to own a portion of a property through the purchase of corresponding NFTs. Furthermore, NFTs will provide a tamper-proof record of property ownership history, enhancing transparency and trust in the marketplace.

By combining the power of smart contracts and NFTs, our platform aims to provide users with a decentralized and efficient solution for property transactions. This integration will not only streamline processes but also ensure greater accessibility, security, and transparency, ultimately revolutionizing the real estate industry for all stakeholders involved.

II. OBJECTIVES

- 1) **Investigate the Potential of Blockchain:** Examine the capabilities of blockchain technology in revolutionizing the real estate industry by introducing transparency, efficiency, and accessibility to property transactions.
- 2) **Explore the Integration of Non-Fungible Tokens (NFTs):** Investigate how NFTs can be utilized to tokenize real-world assets, authenticate ownership, and represent properties on a decentralized platform.
- 3) **Analyze the Role of Smart Contracts:** Assess the impact of smart contracts in automating and streamlining property transactions, including minting and verifying property, listing properties, and transferring ownership.
- 4) **Examine Security and Privacy Concerns:** Investigate the security measures implemented within the blockchain-based platform to protect user privacy, prevent fraudulent activities, and ensure the integrity of property transactions.
- 5) **Examine User Experience and Adoption Challenges:** Explore the user experience of interacting with a decentralized property marketplace and identify potential challenges in adoption, such as technological barriers and user trust.

III. LITERATURE SURVEY

VO Khoa Tan et al. [2] pioneered a Blockchain network with smart contracts, enabling asset digitization and secure transactions. This method enhances transparency and efficiency in real estate transactions.

Shamili Prabakaran et al. [3] Research focuses on the Uniswap protocol, facilitating secure ERC20 token exchange on the Ethereum blockchain through automated liquidity provision, offering users a reliable and efficient crypto coin trading method. It also allows a real estate agent to register a property sale against a registered person. Block chain technology and smart contracts can sort

Ankit Mittal et al. [4] paper presents a blockchain-powered real estate management system, ensuring transparency, security, and efficiency across all departments. Utilizing a distributed permission blockchain, the system offers robust security and automation, addressing real estate management challenges effectively.

Disha Shinde et al. [5] Upon land purchase, government issues hard copy papers, stored in decentralized Inter Planetary File System (IPFS), with hashes securely recorded on Ethereum blockchain via smart contracts for validation and retrieval.

Toqeer Ali et al. [6] advocates for registering lands on the Blockchain via smart contracts, offering efficiency, transparency, and integrity in real estate transactions.

Dipika Bhanushali et al [7]. Physical deeds and government ledger records signify property ownership, yet their vulnerability necessitates a solution. Researchers propose a system where smart contracts generate digital deeds, ensuring integrity through decentralized blockchain storage.

Sobhan Latif et al [8]. aims to explore blockchain's application in the real estate market, highlighting its potential benefits. Initial findings suggest that blockchain technology and smart contracts offer solutions to traditional real estate challenges, fostering a stable-priced market with enhanced functionality.

IV. SYSTEM ARCHITECTURE

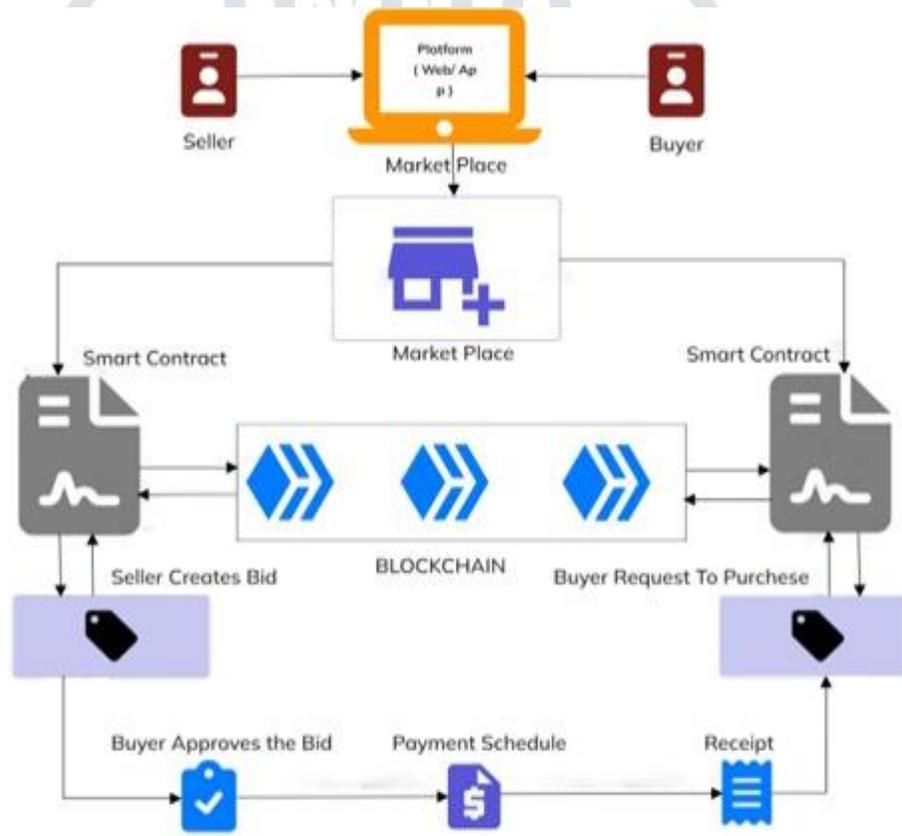


Fig. 1: System Architecture

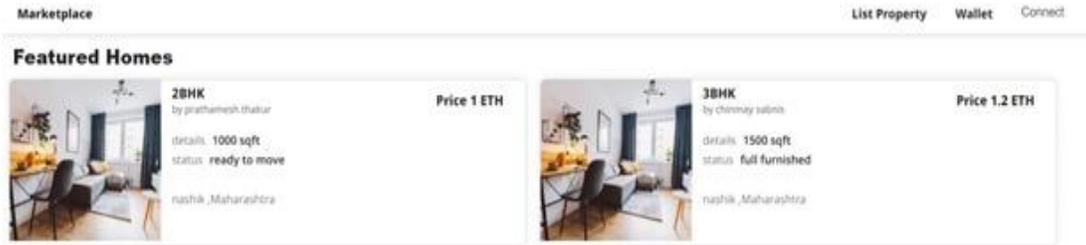
V. METHODOLOGY

This section details the key components of the system, each playing a crucial role in the creation of a secure and transparent platform for tokenizing and trading real estate assets.

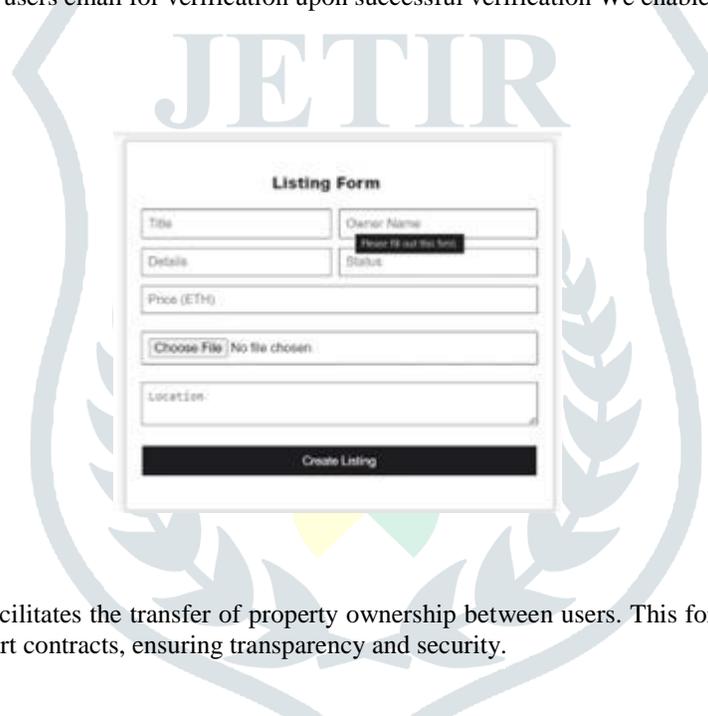
1. Metamask Integration: Enable users to connect their Metamask wallet to the platform for secure transactions. This component displays a "Connect Metamask" button on the platform's interface. Upon clicking the button, prompt users to install Metamask if not already installed. Use Metamask's API to connect the user's wallet to the platform securely.



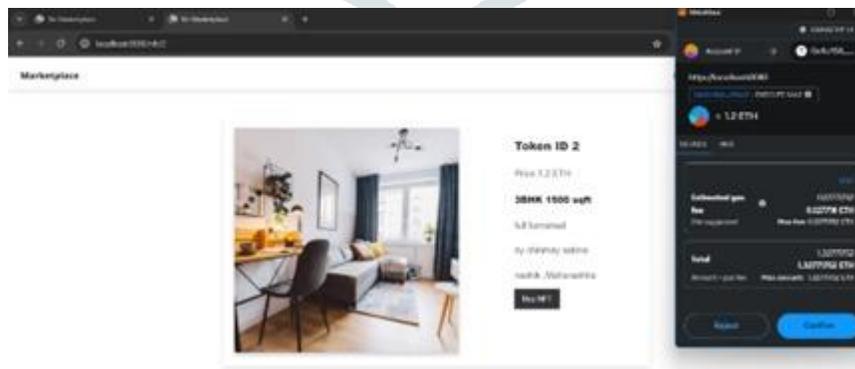
2. Property Listings: We Present users with a user-friendly home page featuring properties for sale. displaying an image, name, description, price, owner, and seller details. We fetch and display properties available for sale from the Blockchain. We provide proper pagination and filtering options for ease of browsing.



3. List a property: Provide users with the ability to list their properties for sale on the platform. Develop a "List Property" button or feature accessible from the home page. Upon clicking, redirect users to a form to enter property details. Collect necessary information such as property name, address, documents, and expected price. We implemented email verification that generate and send otp to users email for verification upon successful verification We enable users to submit their property listing information securely.



4. Ownership Transfer: Facilitates the transfer of property ownership between users. This form automates the ownership transfer process through smart contracts, ensuring transparency and security.



VI. RESULTS AND DISCUSSION

The decentralized real estate platform powered by blockchain technology redefines the real estate landscape by offering a holistic solution to users navigating the intricacies of property transactions. This innovative system provides an intuitive interface, leveraging smart contracts and blockchain's transparency to streamline property transactions and enhance user experiences. Through decentralized architecture, the platform facilitates secure and transparent real estate transactions, reducing reliance on intermediaries and ensuring the integrity of ownership records. The platform's automated property tokenization feature eliminates the complexities of manual processes, providing users with digitally secure and unique assets represented by Non-Fungible Tokens (NFTs). This not only saves time for property owners but also ensures compliance with regulatory standards.

In addition to the blockchain-based transactional features, the system incorporates an intelligent property recommendation system. Using advanced algorithms, this component identifies properties that align with users' preferences, investment strategies, and regulatory considerations. By automating the property discovery process, the platform significantly reduces the time and effort required for manual searches, presenting users with relevant investment opportunities in a timely and personalized manner.

To further empower users, the platform offers a comprehensive resource center. This includes articles, guides, and tutorials on navigating regulatory complexities, understanding blockchain in real estate, and making informed investment decisions. These resources enhance users' knowledge, enabling them to approach real estate investments with confidence and make decisions aligned with their financial goals.

Overall, the real estate platform using blockchain proves to be an indispensable tool for individuals navigating property transactions. With its transparent, secure, and automated features, it empowers users to tokenize their assets efficiently, discover investment opportunities aligned with their goals, and navigate the real estate market with greater success. By providing a supportive and empowering environment, the platform plays a crucial role in transforming traditional real estate practices and contributing to a more accessible and equitable real estate market.

VII. CONCLUSION

In summary, if we use Blockchain and smart contracts can genuinely make the real estate market better. Traditional real estate can be confusing, hard to sell, and not very accessible. But with Blockchain, we can fix these problems. We've seen that Blockchain can bring more clarity, reduce the need for middlemen, and make real estate transactions more secure. Our research is not just a dream, it's a practical solution that can actually make the real estate world easier for everyone.

VIII. REFERENCES

- [1] Dipika Bhanushali, Akshara Koul, Sainiranjana Sharma, Bushra Shaikh, "Blockchain to Prevent Fraudulent Activities: Buying and Selling Property Using Blockchain", International Conference on Inventive Computation Technologies (ICICT), 2020
- [2] VO Khoa Tan, Thu Nguyen, "The Real Estate Transaction Trace System Model Based on Ethereum Blockchain Platform", 14th International Conference on Computer and Automation Engineering (ICCAE), 2022
- [3] P. Shamili, B. Muruganatham, "Blockchain based Application: Decentralized Financial Technologies for Exchanging Crypto Currency", International Conference on Advances in Computing, Communication and Applied Informatics (ACCAI), 2022
- [4] Ankit Mittal, Bhavyansh Sharma, Pinku Ranjan, "Real Estate Management System based on Blockchain", IEEE 7th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON), 2021
- [5] Disha Shinde, Snehal Padekar, Siddharth Raut, Abdul Wasay, S. S. Sambhare, "Land Registry Using Blockchain - A Survey of existing systems and proposing a feasible solution", 5th International Conference On Computing, Communication, Control And Automation (ICCUBEA), 2020

- [6] Toqeer Ali, Adnan Nadeem, Ali Alzahrani, Salman Jan, “A Transparent and Trusted Property Registration System on Permissioned Blockchain”, International Conference on Advances in the Emerging Computing Technologies (AECT), 2020
- [7] Dipika Bhanushali, Akshara Koul, Sainiranjana Sharma, Bushra Shaikh, “BlockChain to Prevent Fraudulent Activities: Buying and Selling Property Using BlockChain”, International Conference on Inventive Computation Technologies (ICICT), 2020
- [8] Sobhan Latifi, Yunpeng Zhang, Liang-Chieh Cheng, “Blockchain-Based Real Estate Market: One Method for Applying Blockchain Technology in Commercial Real Estate Market”, IEEE International Conference on Blockchain (Blockchain), 2020

