"Square-Block" Real Estate Administration Using Blockchain

Ujwal N Sintre[1], Renu Kumar K[2], Santosh N[3], Mr Satish B Basapur[4]
[1, 2, 3, 4] Dept of Information and Technology
[1, 2, 3, 4] Dr Ambedkar Institute of Technology

Abstract- *Our project focuses on real estate management using blockchain technology. The objective is to establish a decentralized and secure platform for administrating real estate transactions, smart contracts, and property ownership records. We make use of various tools and technologies to achieve this goal. Smart contracts, written in Solidity, serve as the base for blockchain infrastructure. They automate and enforce the guidelines linked with real estate transactions, ensuring transparency, immutability, and security. The React.js framework, along with CSS and Bootstrap, is used for front-end development, enabling uncomplicated display for utilizing and interacting with the blockchain-based system.*

The hardhat development environment is utilized to create the blockchain environment, enabling efficient smart contract development, testing, and deployment processes. The project imposes the Polygon network, a layer 2 scaling solution, to deploy the smart contracts on a private network, enhancing scalability and low cost. Third-party web services are also utilized to enhance the functionality and features of the platform, expanding its capabilities and user experience.

Comprehensively, the real estate management project presented in this paper demonstrates the potential of blockchain technology to revolutionize the real estate industry.

Keywords- Blockchain Technology, Smart contracts, Solidity, React.js, HardHat Environment, Polygon network

I. INTRODUCTION

The real estate industry has long been plagued by inefficiencies, fraudulent activities, and legal disputes. To tackle these challenges and bring about a new era of transparency and trust, this project introduces a groundbreaking solution that geares the potential blockchain technology. By utilizing smart contracts developed in Solidity, the project automates and secures real estate transactions, ensuring unprecedented transparency and immutability throughout the entire process. The user display, built with React.js, CSS, and Bootstrap, provides an elegant and intuitive experience, seamlessly connecting users to the underlying blockchain-based platform. The project also streamlines the creation, testing, and deployment of smart contracts using the Hardhat environment, reducing development time and ensuring trustable. To enhance scalability and low cost, the smart contracts are deployed on the Polygon network, a cutting-edge layer 2 scaling solution. This integration enables swift and cost- efficient transactions while ensuring the privacy and security of sensitive real estate data. Additionally, the project integrates various third-party web services to enhance functionality and cater to the diverse needs of real estate stakeholders. By exemplifying the transformative potential of blockchain technology in restructuring real estate management, this project sets the stage for a future where trust, performance-oriented, and transparency are the norm in the industry.

II. SYSTEM ARCHITECTURE

The architecture of this project is designed to leverage the potential blockchain technology for real estate management. At its core, it consists of a decentralized network built on the blockchain, with smart contracts written in Solidity serving as the support of the system. These smart contracts automate and enforce real estate transactions, ensuring transparency, immutability, and security. The front-end development is used using React.js, CSS, and Bootstrap, enabling uncomplicated display for utilizing and interacting with the blockchain-based platform. This display enables users to seamlessly navigate through various features and functionalities, such as property listings, transaction history, and contract management. To facilitate the development and deployment of smart contracts, the project utilizes the Hardhat environment. Hardhat streamlines the process of writing, testing, and deploying smart contracts, enabling developers to rapidly iterate and ensure the trustable and performance orientation of the system. The smart contracts are deployed on the Polygon network, a layer 2 scaling solution. Polygon enhances the scalability and low cost of the blockchain, allowing for faster and more affordable transactions. By deploying on a private network, the system ensures the privacy and security of sensitive real estate data. To enhance the functionality of the platform, third-party web services are integrated. These services provide additional features, such as

identity verification, digital signatures, and secure storage, further modifying the user experience and expanding the capabilities of the system.

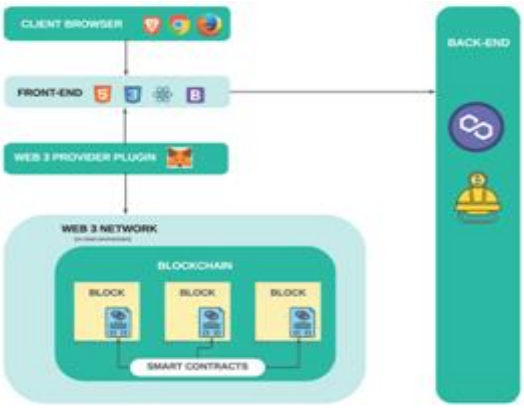

Figure 1: Flow Diagram

III. IMPLEMENTATION

Software Implementation

1. Home Module

The home module in the real estate management project serves as the entry point for users, enabling property listings, search ability, and navigation options to explore different sections of the platform. Users can browse listings, search for specific properties, and easily access other modules such as the creator's page, List Property, network activity,user-info, List asset and owners hub. The home module offers a seamless experience for property discovery and access to various functionalities.

2. Creators Module

The creators module is used to portray the current strength and progress of the application, by giving appropriate credits to developers and copyright owners.

3. Network Activity Module

This module elaborates on the overall Private Polygon network status and all transaction history linked with it. To promote transparency and trust, a user can also access the total properties listed in the network.

4. List asset Module

New properties can be listed in the Private network for selling or buying, as per the user's choice. To Create these new properties, you need to list them using this List asset module and verify the same using the consensus mechanism of the blockchain network. The List asset module uses Pixabay Third party website for hashing the properties' Images and verification.

IV. RESULTS

Figure 2: Landing Page

The landing page offers a secure and customized experience for those interested in buying and selling real estate assets. Individuals can access this by visiting the system's website or using the mobile application.

Figure 3: MetaMask Login Pop-up

The Meta mask login pop-up allows users to connect their crypto wallet to the Real estate Web application, as shown above.

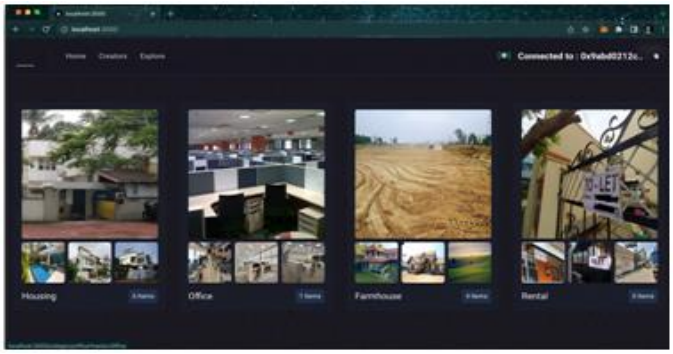

Figure 4: Top Categories Page

This page shows the top categories in Real estate properties.

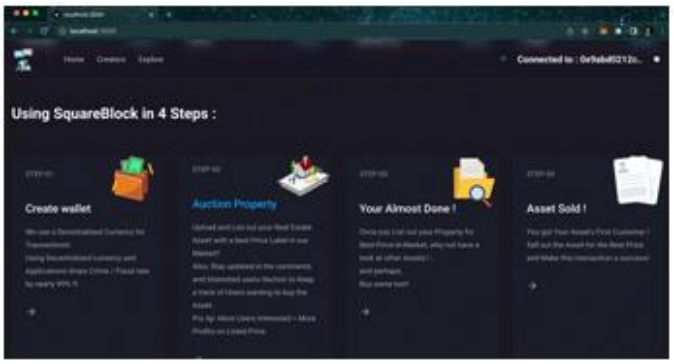

Figure 5: Using SQUARE-BLOCK

This page shows how to use the SQUARE-BLOCK application, as above.

Figure 6: Network Activity page

This page gives the details of the private netwoork

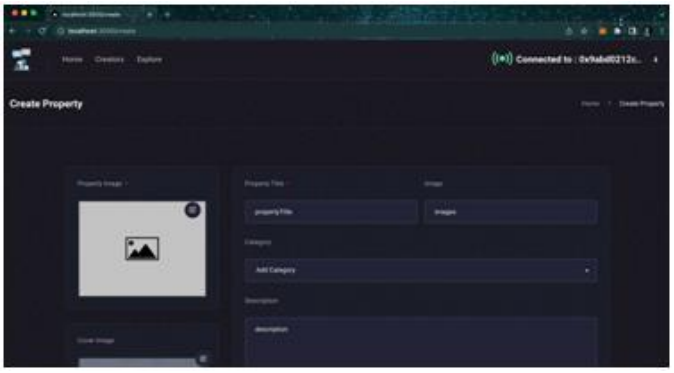

Figure 7 List asset Page

This page allows users to list new assets and upload them for selling-buying.

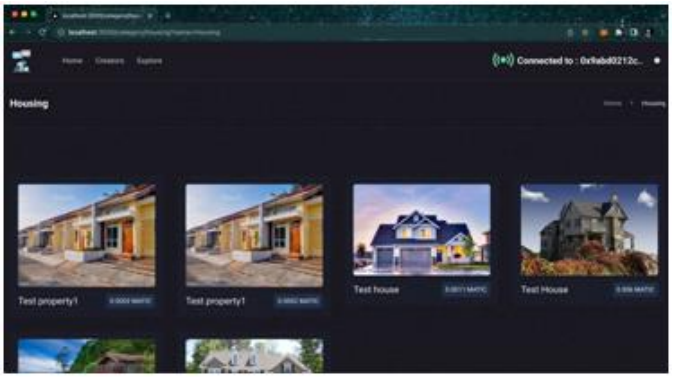

Figure 8: Category Page

This page shows the porperties listen in the particular category, where the user can buy-sell assets.

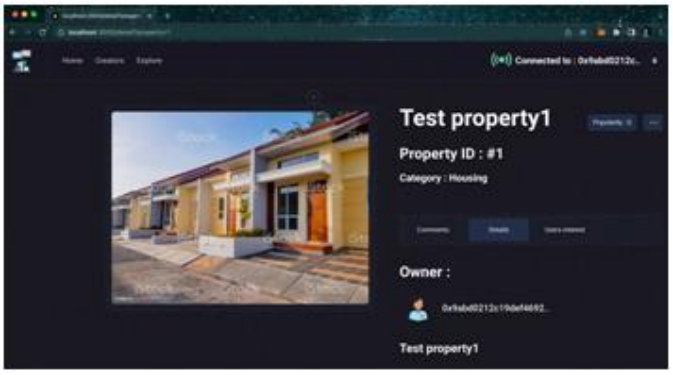

Figure 9: Property Details

This page allows the user to view the property and its details for buying.

V. CONCLUSION

In conclusion, this real estate management project harnesses the potentials blockchain technology to revolutionize the industry. By leveraging smart contracts, coded in Solidity, the project automates and secures real estate transactions, ensuring transparency and trustable factor. The integration of React.js, CSS, and Bootstrap creates uncomplicated display, enabling seamless interactions with the blockchain-based platform. The adoption of the Hardhat environment simplifies smart contract development, while the deployment on the Polygon network ensures scalability and low cost. The incorporation of third-party web services enhances functionality, expanding the platform's capabilities.

Overall, this project presents a dynamic solution for real estate management, addressing the challenges of traditional processes through blockchain technology. It offers increased transparency, smooth transactions, and improved security, fostering trust among stakeholders. By enabling a secure, efficient, and user-friendly platform, this project paves

the way for a new era of real estate management, transforming the industry and restructuring the way transactions are conducted.

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