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# Land Registration with Blockchain

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**ABSTRACT:** The current land registration system in India involves a paper-based approach that is susceptible to fraud, errors, and security risks. This traditional method is time-consuming and involves a complex documentation process, which contributes to the rising cases of fraudulent activities. To address these issues, this paper proposes the use of blockchain technology to create a decentralized land registration system that is secure, reliable, and transparent. The blockchain model offers an immutable and decentralized public ledger that can enhance the accuracy and security of land records. By removing middlemen, the blockchain land registry platform can accelerate the validation process of land ownership, reduce costs, and decrease the time required for land registration. The primary objective of this paper is to explore the potential of blockchain technology in land registration, with a focus on how it can prevent fraud, store land ownership records, and facilitate ownership transfer through cryptographic algorithms and smart contracts. This paper will first discuss the challenges faced by traditional land registration systems, including security, transparency, and efficiency. It will then examine how blockchain technology can address these challenges by providing a secure and transparent land registration system.

**KEYWORDS:** Blockchain Technology; Energy efficient algorithm; Manets; total transmission energy; maximum number of hops; network lifetime

## I. INTRODUCTION

Land registration is a process of recording detailed information regarding land, such as ownership and property size. Currently, India uses a paper-based land registration system, which involves physically registering the land. However, this system has several drawbacks. For instance, referencing any data in the future requires significant labor. Moreover, the system is not transparent, and recording property sales accurately can be challenging. The database method used for storing data is also inadequate in terms of data security.

Blockchain is a distributed ledger technology that records all transactions that take place across a peer-to-peer network. Implementing land registration using blockchain can help prevent fraudulent activities, making the system more secure. Blockchain can also prevent illegal activities involved in land transactions as it is challenging to duplicate. All contracts and ownership details are maintained in a decentralized way, eliminating the need for physical intervention. Thus, it is easier to track data transactions, improving the overall security of the system.

Blockchain provides an opportunity to establish a robust system for digital identity. Using blockchain, each block in the network represents data involved in a land transaction, such as property ID, property number, owner details, transaction amount, mode of payment, and last transaction details like the amount paid for the transaction.

Implementing applications using blockchain guarantees the quality of digital data. Nowadays, technology uses password-based approaches for accessing confidential information. However, storing data in insecure systems is unreliable, especially for privacy and data security issues. The authentication schemes followed by blockchain-based applications are based on stringent identity verification based on public key cryptography.

## II. RELATED WORK

### A. Existing System

Some states in India have explored the use of blockchain for land registration. For example, the state of Telangana has initiated a pilot project called "Dharani" to implement a blockchain based land registration system. It's essential to note

that while blockchain offers many advantages for land registration, the successful implementation of such systems requires collaboration among government agencies, legal frameworks, and community acceptance. Additionally, challenges such as scalability, interoperability, and the need for regulatory clarity must be addressed for widespread adoption.

### B. Proposed System

The proposed land registration system leveraging blockchain technology represents a groundbreaking approach to enhance the efficiency, transparency, and security of property transactions. Traditional land registration processes often suffer from challenges such as fraud, delays, and disputes. By implementing blockchain, a decentralized and tamper-resistant ledger, we aim to revolutionize the way land transactions are recorded and verified. In this system, each property would be represented as a unique digital asset on the blockchain, with ownership details, transaction history, and legal documentation securely stored in a transparent and immutable manner. Smart contracts, self-executing programs with predefined rules, would automate the transfer of ownership upon fulfillment of contractual obligations, reducing the need for intermediaries and minimizing the risk of errors.

## III. STEPS TO RUN THE APPLICATION

- A. Choose an appropriate blockchain platform:** Select a blockchain platform that is suitable for your experiment. For example, you may choose Ethereum, which is a popular platform for building decentralized applications. Set up the experiment: Set up the environment for the experiment by creating a blockchain network and deploying the smart contracts that implement the land registration system.
- B. Develop the front-end website:** Use React.js, a popular JavaScript library for building user interfaces, to create the front-end website for the land registration system. This can include designing and implementing the user interface, creating components for data input and display, and handling user interactions.
- C. Integrate the front-end with the blockchain:** Connect the front-end website developed using React.js with the smart contracts deployed on the blockchain. This can involve using web3.js, a JavaScript library for interacting with the Ethereum blockchain, to send and receive transactions, read and write data to the smart contracts, and handle events and notifications.
- D. Using Web3 to integrate the front-end and the blockchain:** Utilize the Web3 library for interact with Ethereum blockchain, to enable communication between the front-end interface developed using React JS and the smart contracts deployed on the blockchain. Web3 can be used to securely connect the front-end of the land registration system with the blockchain, allowing for seamless interaction and transaction processing between the users and the blockchain-based land registration system.
- E. Implement user authentication and authorization:** Use React.js to implement user authentication and authorization functionalities for the land registration system. This can include features such as user registration, login, and role-based access control to ensure secure access to the system and protect sensitive data
- F. Implement the seller's interface using React JS:** Develop the front-end interface for the seller's interactions with the land registration system using React JS. This includes creating interfaces for listing properties for sale, verifying ownership and property details, and managing ownership transfer requests from buyers.
- G. Implement the buyer's interface using React JS:** Design and implement the frontend interface for the buyer's interactions with the land registration system using React JS. This involves creating user-friendly interfaces for viewing property details, submitting purchase requests, and managing ownership transfer requests.

## IV. EXPERIMENTAL RESULTS

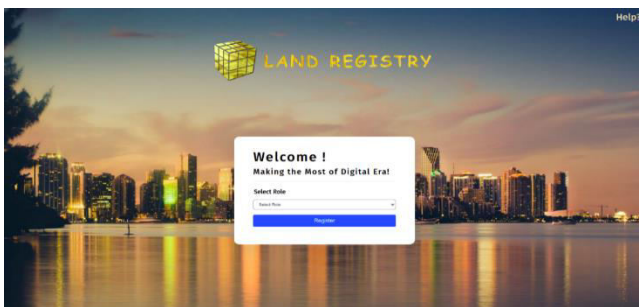


Fig 1. Home Page

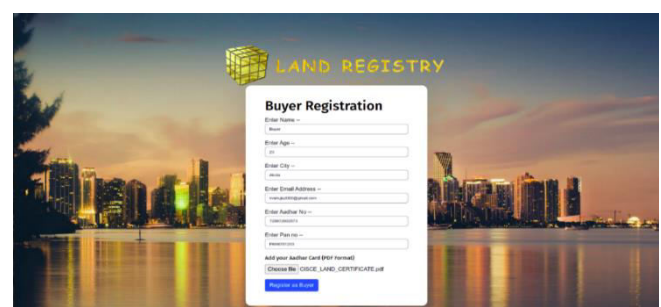


Fig 2. Buyer Registration

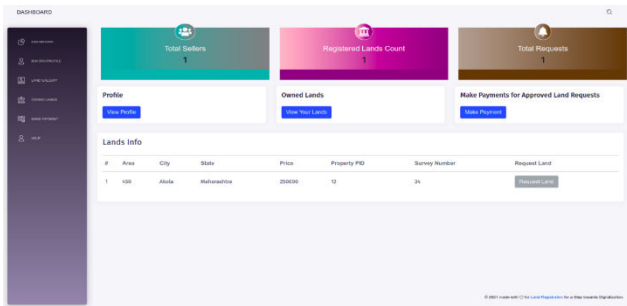


FIG 3. BUYER DASHBOARD

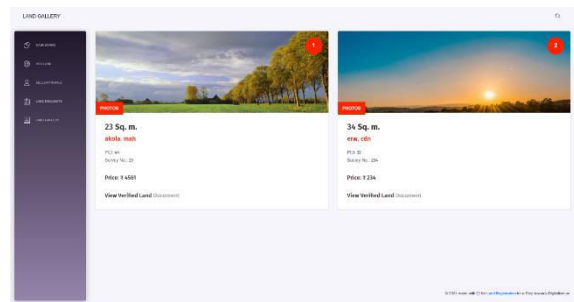


FIG 4. LAND GALLERY

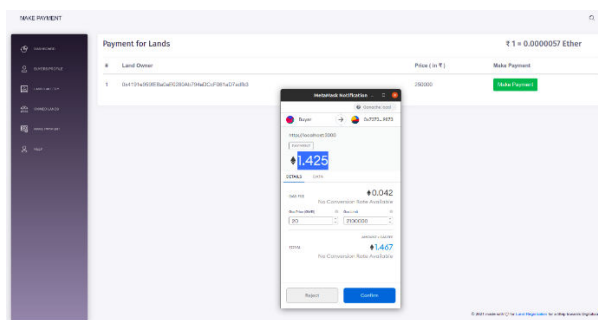


Fig 5. Make Payment

## V. CONCLUSION

The key elements of both traditional and modern record keeping systems are modelled in the proposed conceptual framework for blockchain-based land register systems. A situation that led to the conceptual framework was developed after a survey of many frameworks and some of the more forceful techniques and concepts used in them. The mapping of the scenarios allowed in classifying the key elements, which was helpful for the framework that was proposed. Blockchain-based land registry systems might offer a decentralised answer to the issue of public corruption, privacy breaches, and mismanagement. The implementation of blockchain technology in a land register system and potential effects on present land registration practises are demonstrated in this article. A private blockchain-based conceptual framework has been used up to this point, but this process can be expanded in the near future. The only reason the paper has been active is to create a conceptual foundation. However, in the future, a software system could be made using similar frameworks. It serves as a framework and sheds light on the system itself.

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