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Land Registration System Using Blockchain

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Abstract
land is an asset, and transferring the ownership of a piece of property from one party to another is both a significant and time-consuming procedure. Not only there's a lot of documentation, but there are also numerous middlemen and several verifications at various stages of the process. This reduces the overall reliability of the procedure and increases the risks of forgery. It also takes a lot of work to learn about earlier transfers. This issue is readily solved by using blockchain for the land registration system. By eliminating agents from the process, this will reduce corruption. It will also boost speed and build trust in the system without any involvement of any central agency. Blockchain is a decentralized, unalterable database that tracks every valid transaction. To maintain the chain of transactions, it employs cryptographic methods, consensus procedures, and hashing algorithms. This maintains the system's transparency and immutability. The goal of this project is to develop a user-friendly, blockchain-based land registration system that will make the procedure easier while maintaining security and trust. In locations like India, where thousands of transfers are made on a daily basis, the quantity of paper necessary to keep records is likewise quite large. This approach will not only bring average people closer to technology, but it will also assist in safeguarding the environment by eliminating laborious paperwork.

Keywords: Blockchain, Ethereum, Smart Contracts, Ganache, Metamask, Truffle

1. Introduction

- The project centers on the vital need for accurate land records within government agencies.
- Land, being a significant asset, requires precise documentation of ownership and rights. However, the current systems face challenges in dealing with issues like fraud and ownership disputes, highlighting the necessity for a more effective approach.
- The existing land registration systems have notable shortcomings. Challenges include difficulties with fraudulent transactions, unclear sale documentation, and problems arising from outdated records, fragmented lands, and proprietorship conflicts.
- These limitations underscore the need for a more reliable solution. The project aims to address the deficiencies of current land registration systems by proposing a solution based on Blockchain technology, specifically using Ethereum.
- Blockchain technology is an advanced database mechanism that allows transparent information sharing.
- Blockchain database stores data in blocks that are linked together in a chain. The data is chronologically consistent because you cannot delete or modify the chain without consensus from the

network.

- As a result, you can use blockchain technology to create an unalterable or immutable ledger for tracking orders, payments, accounts, and other transactions. The system has built in mechanisms that prevent unauthorized transaction entries and create consistency in the shared view of these transactions.
- Various blockchain types like Ethereum, Bitcoin, Stellar, and Ripple exist, each with distinct features, governance models, and use cases. This project utilizes Ethereum, known for more than transaction recording; it supports "smart contracts" that autonomously manage tasks like data storage and retrieval without central authority.
- Ethereum's strengths include DApp creation, an engaged developer community, security enhancements, and compatibility with other blockchain projects.

2. Literature Survey

- Securing Land Registration using Blockchain: Krishnapriya S
- Blockchain enabled Digitization of Land Registration: R.C.Suganthe
- A secured land registration framework on Blockchain: Meghali Nandi
- Land Registry Management using Blockchain: Ameya Thosar
- Blockchain based Land Registry with Delegated Proof of Stake (DPoS) Consensus in Bangladesh: Mahbub Alam Majumdar

3. Abbreviations and Acronyms

1. DPoS - Delegated Proof of Stake
2. DApp - Decentralized Application

4. Methodology

4.1 Modules

4.1.1 User Registration

Individuals who want to engage in land transactions register their details to obtain system access.
Users fill in required information such as name, contact details, and address.
The system generates unique login credentials (username and password) for each user.
User details are securely stored in the system's database for future reference.

4.1.2 Central Authority Login

Centralized authority managing user registrations and land transactions for oversight and control.
The central authority logs in using secure credentials.
Reviews and processes user registration requests, either approving or rejecting them.
Manages land registration requests, ensuring adherence to regulations and standards.

4.1.3 User Login as Seller

Sellers use this module to interact with the system, adding their land details for sale and monitoring the status of their requests.
Sellers log in with their unique credentials.
Enter details of the land they wish to sell, including ownership proof and other relevant documentation.
Check the status of their land registration requests, including approvals or any required actions.

4.1.4 User Login as Purchaser

Purchasers log in to explore available lands for purchase and track the progress of their transactions.
Purchasers provide login credentials to access the system.
Browse and view a list of available lands for purchase.
Check the status of their requests to purchase land, ensuring transparency in the transaction process.

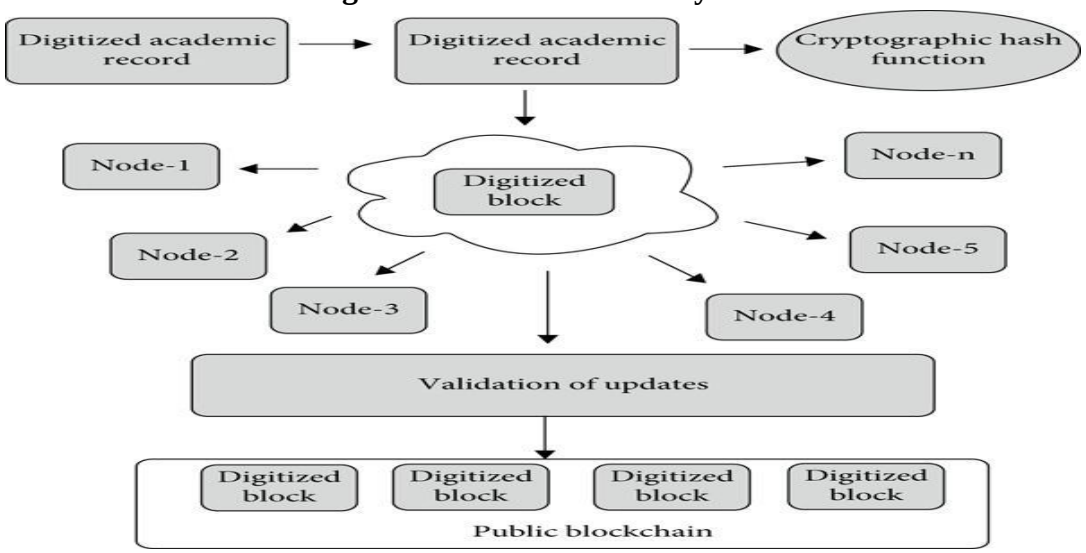
4.2 Blockchain Integration

Ethereum's blockchain technology forms the foundation, leveraging smart contracts, cryptographic algorithms, and consensus mechanisms to create a robust and user-friendly land registration system.
Solidity, a programming language tailored for creating smart contracts on the Ethereum platform, is employed to enact the essential functionalities required for land registration in the project.
Transactions recorded on the Ethereum blockchain are secured through cryptographic techniques, making them clear, irreversible, and traceable. This enhances the overall integrity of the land registration process.
By eliminating the need for middlemen and utilizing blockchain's inherent transparency, the system enhances trust and reduces corruption in the land registration process. Blockchain ensures that all transactions are recorded and visible to participants in a tamper-resistant manner.

5. System Design

5.1 System Architecture

Fig 1 : Architecture of our system



6. Results

Fig 2 : Home Interface

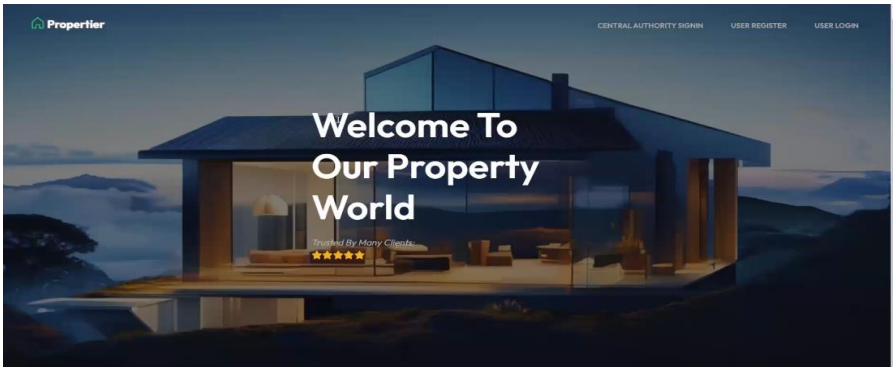


Fig 3 : Sending Request To Central Authority By filling Credentials

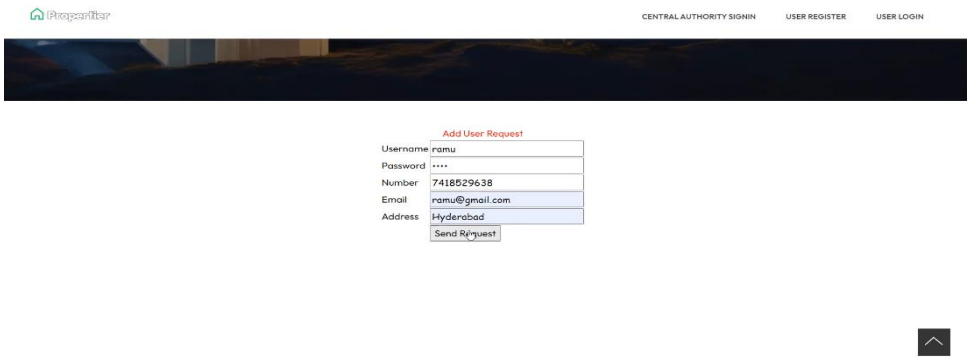


Fig 4 : Accepting User Request

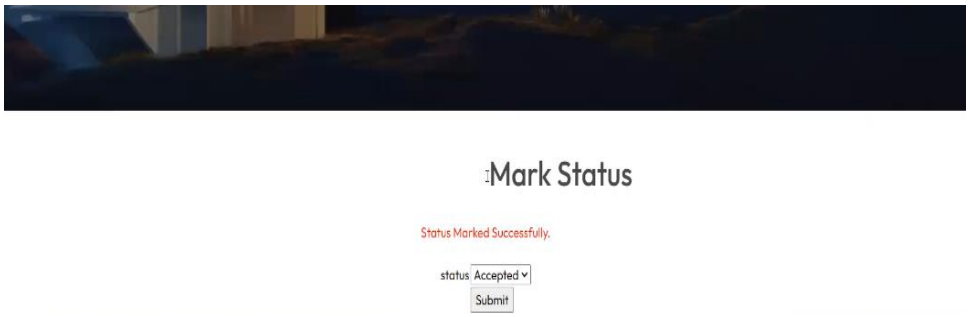


Fig 5 : Central Authority Login

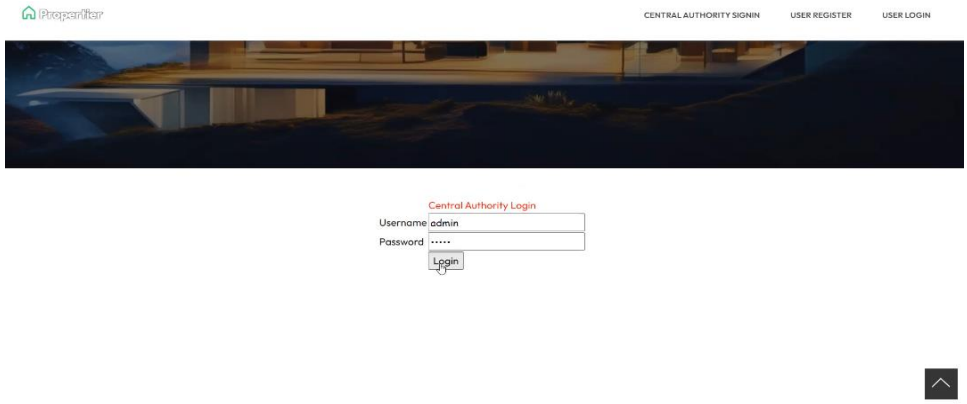


Fig 6 : Add land Details

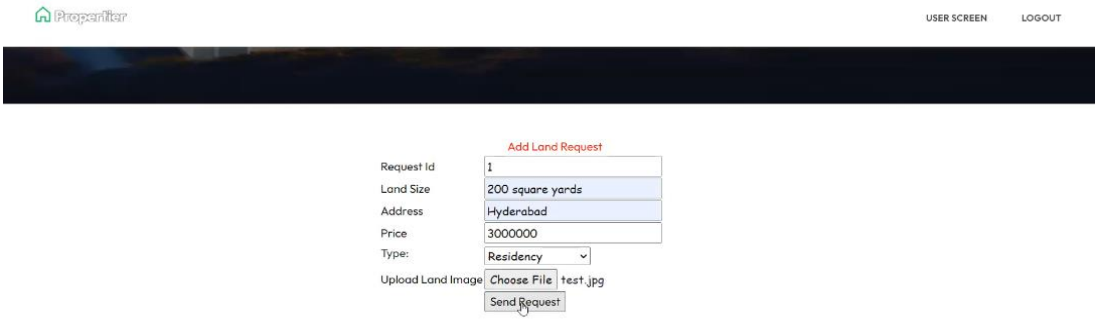
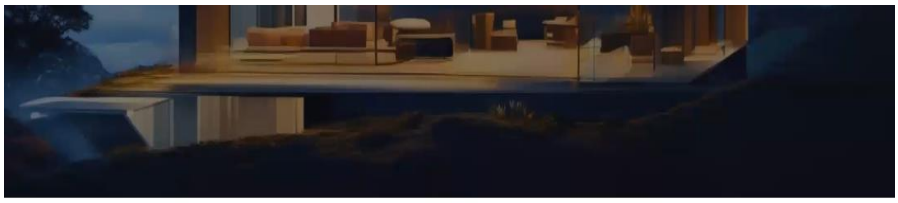


Fig 7 : Accepting land Request

Fig 8 : Enter amount for transaction



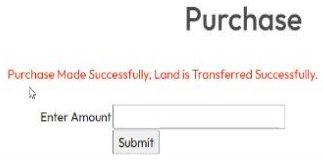
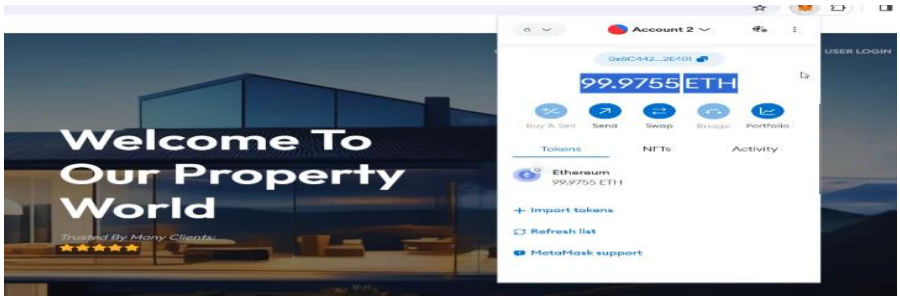
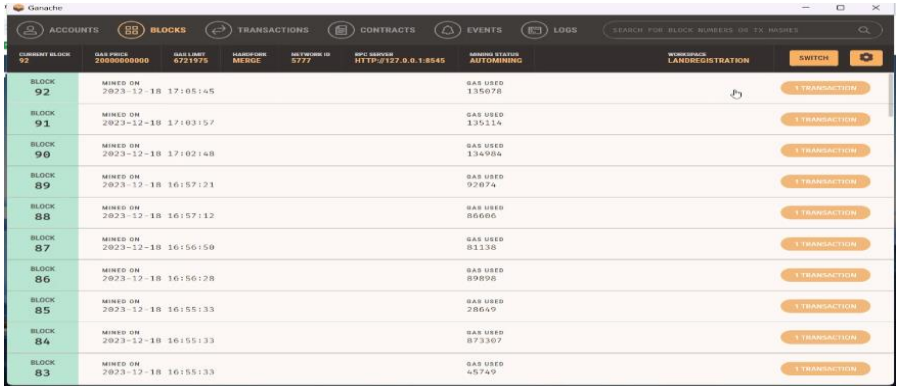


Fig 9 : Transactions





7. Conclusion

Successfully user-friendly blockchain-based land registration system is developed , streamlining the complex process of transferring land ownership and minimizing paperwork, thereby enhancing overall efficiency.The project's decentralized approach addresses corruption issues in land registration by removing intermediaries, leading to increased reliability and a reduced likelihood of forgery, ultimately contributing to a more trustworthy land registration process.Leveraging blockchain technology, the project successfully expedites land registration processes. By eliminating the need for multiple verifications at various stages, the system becomes more responsive to user needs, enhancing overall speed and efficiency.The project's broader impact extends to environmental sustainability, reducing paper use in land record maintenance. By encouraging technology adoption and eliminating manual paperwork, especially in regions with frequent land transfers like India, the project makes a positive contribution to the environment.

8. Future Scope

Enhancements in User Interface and Accessibility.
Research on Interoperability with Other Blockchains
Continuous Improvement and Feedback Mechanisms

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