

LAND REGISTRY USING BLOCKCHAIN

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ABSTRACT

Exploring the integration of blockchain technology into land registry systems is the primary focus of this research, concentrating on augmenting efficiency, transparency, and security within the domain. Employing an extensive research framework, we rigorously investigate the functionality of blockchain in the context of land registries. Our analysis reveals substantial reductions in transaction times, bolstered data integrity, and increased resilience against fraudulent activities. These findings accentuate the pivotal role that blockchain can play in restructuring conventional land registry practices, instilling trust, and mitigating discrepancies. Beyond the immediate benefits, the study extrapolates into a forward-looking perspective, contemplating the widespread adoption and potential consequences of implementing blockchain technology in the field of land registration. Key aspects encompassed in this exploration include blockchain, land registry, efficiency enhancements, transparent data management, heightened security protocols, and reduced transaction times. It is important to note that while the study acknowledges the transformative potential of blockchain, it does not underestimate the challenges and considerations associated with its implementation. By shedding light on both the positive and potential pitfalls, this research seeks to contribute to a nuanced understanding of how blockchain technology can be leveraged effectively in the context of land registries. The outlined key terms encapsulate the essence of this investigation, providing a comprehensive overview of the multifaceted impact that blockchain integration can have on land registration systems.

Keywords: Blockchain, Land Registry, Operational Efficiency, Data Transparency, Security Measures, Transaction Time Reduction.

I. INTRODUCTION

The integration of blockchain technology in land registry represents a paradigm shift in property management and documentation. Traditional land registry systems are often marred by inefficiencies, susceptibility to fraud, and a lack of transparency. In contrast, blockchain offers a decentralized, secure, and transparent ledger that has the potential to revolutionize how land ownership is recorded and verified. This research delves into the transformative implications of employing blockchain for land registry, aiming to enhance accuracy, reduce discrepancies, and instill trust in real estate transactions. By exploring the current landscape of blockchain in land registry, this study seeks to provide insights into its potential benefits and challenges, guiding future developments in this critical domain.

II. METHODOLOGY

- 1. User Authentication:** Users can log in using a private key or MetaMask wallet, entering personal details and uploading identity documents on their first login.
- 2. Verification Process:** Only the land inspector, added by the contract owner, has the authority to verify users. The inspector reviews documents and details for verification.
- 3. Land Registration:** Verified users can add their lands, providing details and documents. Land verification is solely performed by the land inspector to ensure legitimacy.
- 4. Land Sale Process:** Landowners list verified land for sale. Other users can view available lands, send purchase requests, and await owner responses.
- 5. Transaction Assurance:** The land inspector ensures transparent and legitimate transactions, confirming buyer payments and overseeing the ownership transfer with the attendance of buyer, seller, and witness.
- 6. Verification Documentation:** During ownership transfer, the land inspector takes pictures of involved parties, collects witness information, and generates a digitally signed document uploaded to the database.
- 7. Post-Transfer:** After completion, buyers can view the purchased land in their "My Land" option.

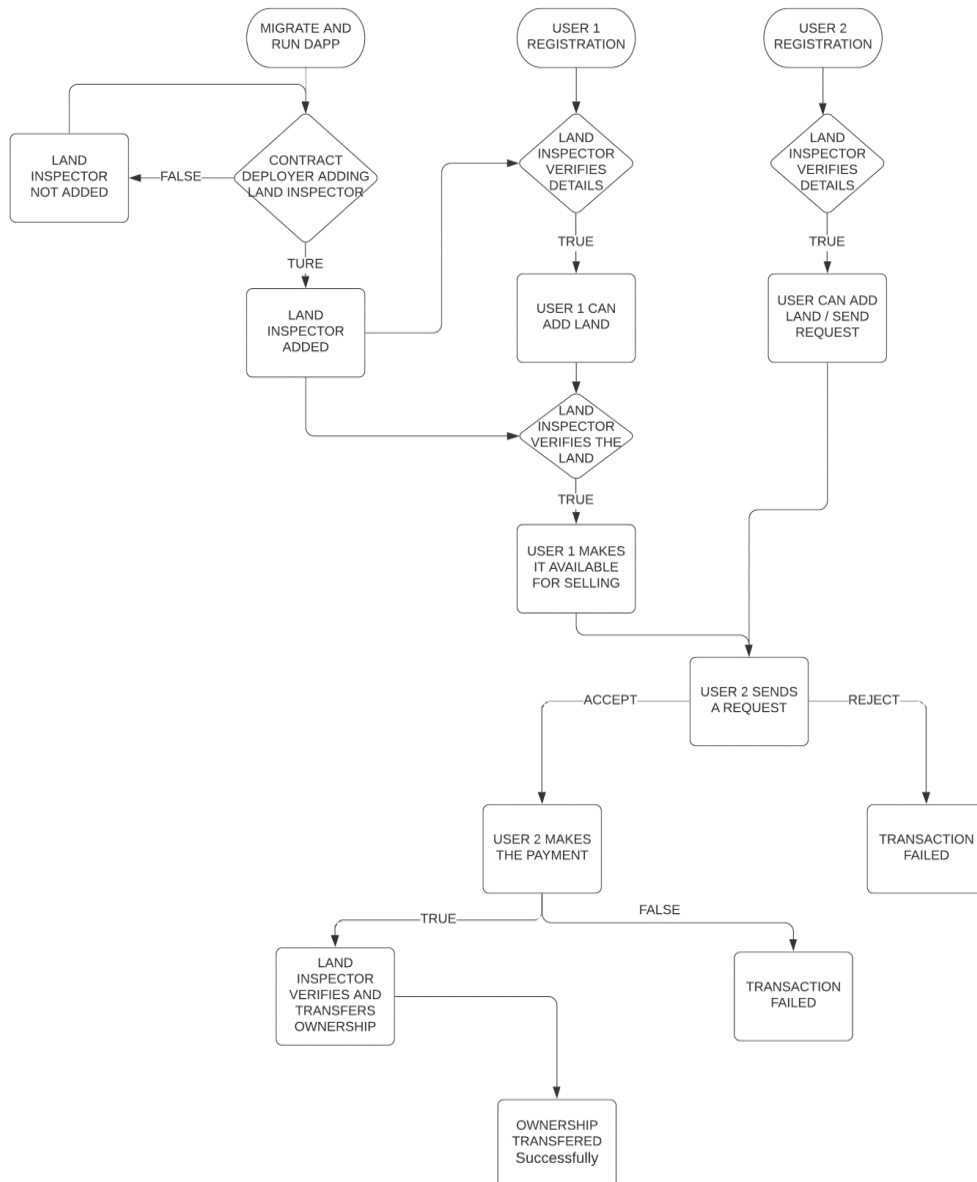


Fig. 1. Flowchart Of the System

III. COMPONENTS

There are 5 main components of the project -

1. **Flutter:** Flutter is used for cross-platform frontend development, simplifying user, inspector, and owner interactions. Truffle IDE sets up a secure DAPP for efficient land-related transactions, ensuring scalability and a seamless experience.
2. **Smart Contract:** Blockchain, akin to the internet for email, enables diverse applications like cryptocurrency. Bitcoin offers conditional value transfer, while Ethereum expands with smart contracts, embedding business logic for secure property registration.
3. **Truffle:** Decentralized apps (DApps) on the Ethereum blockchain are built efficiently with the Truffle framework, offering a unified environment for creating, testing, and deploying smart contracts, streamlining the development process.
4. **Metamask:** MetaMask, a renowned cryptocurrency wallet, facilitates seamless interaction with the Ethereum blockchain without a full node. It simplifies managing multiple accounts, enhances dApp engagement, and ensures security through encryption and features like phishing protection.
5. **web3.js:** Web3.js, a JavaScript package, facilitates seamless communication with the Ethereum network through the JSON-RPC protocol. Developers use it for transactions, data reading, and smart contract development, supporting both Ethereum Mainnet and Testnets.

IV. RESULTS AND DISCUSSION

The utilization of blockchain technology in property registration yields numerous advantages, establishing a transparent, tamper-proof system accessible to all involved parties. The decentralized nature of blockchain ensures secure and swift transactions, eliminating single-party control and the need for intermediaries, consequently reducing the risk of fraud. The incorporation of smart contracts automates property registration and transfer, significantly reducing time and cost while ensuring contractual compliance. The transparency of blockchain prevents fraudulent activities in property transactions, as any attempt to manipulate ownership records is immediately detected by the distributed network. This enhanced security and reliability in property registration contribute to a transformative solution benefiting all stakeholders involved in real estate transactions.

V. APPLICATIONS

- 1. Transparent Security:** Immutable blockchain records enhance transparency and security against fraud.
- 2. Efficiency and Cost Reduction:** Smart contracts streamline processes, reducing time delays and administrative costs.
- 3. Decentralized Trust:** Elimination of intermediaries fosters trust and integrity in the land registry system.

VI. CONCLUSION

This study introduces an innovative approach to land registry using blockchain technology. The proposed system aims to revolutionize property transactions, ensuring a secure and transparent process. By leveraging blockchain's immutable ledger, this solution enhances the integrity of land records, minimizes fraud, and eliminates the need for intermediaries. The implementation of smart contracts streamlines and automates the registration process, leading to increased efficiency and reduced administrative costs. Ultimately, this blockchain-based land registry system offers a decentralized, trustworthy platform, addressing challenges in traditional land management and paving the way for a more reliable and accessible real estate ecosystem.

VII. FUTURE ENHANCEMENT

Blockchain's transformative impact on security extends across industries, and its application in cloud storage shows promise for advanced features. Our network, currently on the Sepolia testnet, aims to transition to a Mainnet or private Ethereum network for real-world integration. Scaling plans involve hosting our DAPP on platforms like AWS as user numbers increase. Collaboration with government agencies will provide real-world testing and valuable feedback for continuous improvement.

VIII. REFERENCES

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