Report On

Land Registry Using Blockchain

Submitted in partial fulfillment of the requirements of the Course project in Semester VII of fourth year Computer Science and Engineering

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CERTIFICATE

This is to certify that the project entitled "Land Registry using Blockchain" is a bonafide work of "Prathmesh Thakare (Roll No. 61), Tejas Wani (Roll No. 65), Pritesh Dhumal (Roll no. 11)" submitted to the University of Mumbai in partial fulfillment of the requirement for the Course project in Semester VII of fourth year Computer Science and Engineering.

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Table of Contents

Chapter 1
Introduction

1.1 Introduction

The "Land Registry Using Blockchain" project represents a transformative shift in the real of land management and ownership documentation. With the integration of blockchain technology, this initiative seeks to redefine the conventional land registration processes by introducing a secure, transparent, and highly efficient system for recording land ownership and transactions. In doing so, it addresses the inherent challenges and shortcomings associated with traditional land registries.

1.2 Problem Statement

Across the globe, traditional land registration systems have been plagued by numerous issues. These encompass fraudulent land transfers, opacity in ownership records, excessive paperwork, and bureaucratic red tape. These persistent problems contribute to legal disputes, corrupt practices, and inefficiencies. The project's primary goal is to provide a robust solution to these challenges by harnessing the capabilities of blockchain technology, mitigating fraudulent activities, enhancing transparency, and simplifying land registration and transaction processes.

1.3 Objectives

The objectives of this project are multifold. Firstly, it endeavors to develop a blockchain-based land registry system that ensures the immutability and incorruptibility of land records. Secondly, it aims to establish a framework that promotes transparency and reduces the risk of fraudulent land transactions, thereby minimizing disputes and corruption. Thirdly, it seeks to streamline the land registration and transaction procedures, making them more efficient and accessible to landowners and authorities. Ultimately, the project aims to provide an end-to-end solution that revolutionizes land management and ownership documentation.

Chapter 2

Literature Survey

2.1 Analysis of Literature

Sr. No.	Title of the Paper	Advantages	Disadvantages
1	Land Registration System Using Blockchain	It offers the potential to address several critical challenges in the current paper-based land registration system.	The legal and regulatory framework for such a system may need to be developed, which can be a complex and time-consuming process
2	Securing Land Registration using Blockchain	It presents a compelling solution to address the vulnerabilities in the current land registration process.	Implementing a blockchain-based land registry may face challenges in terms of initial infrastructure and technology adoption costs.
3	Blockchain-Based Land Registration System: A Conceptual Framework	It addresses the issues of data fraud, security, and system reliability.	Resistance from traditional land management authorities and adaptation to the new technology could be obstacles.
4	Land Registration System Using Block-chain.	It replaces the manual documentation with smart contracts.	Resistance from existing stakeholders, such as brokers and government agencies, may hinder adoption.
5	Digital Land Registry System Using Blockchain	It revolutionize land registration systems by eliminating intermediaries, improving transaction speed, and enhancing security	Transitioning from a centralized system to a blockchain-based one requires adaptation, regulatory adjustments, and overcoming resistance from existing stakeholders.

2.2 Research Gap

The literature survey also sheds light on a significant research gap in the domain of land registry and blockchain integration. It underscores the pressing need for a standardized, scalable, and highly secure solution that can be universally adopted. Furthermore, the survey emphasizes the critical importance of addressing legal and regulatory challenges that may hinder the widespread adoption of blockchain-based land registries.

Chapter 3
Proposed System

3.1. Introduction

The proposed system heralds a paradigm shift in the management and documentation of land ownership. It leverages blockchain technology to introduce a comprehensive and highly secure land registry system. This innovative solution encompasses a multitude of features, including decentralized data storage, smart contracts to facilitate land transactions, and an intuitive user interface designed to empower landowners and authorities.
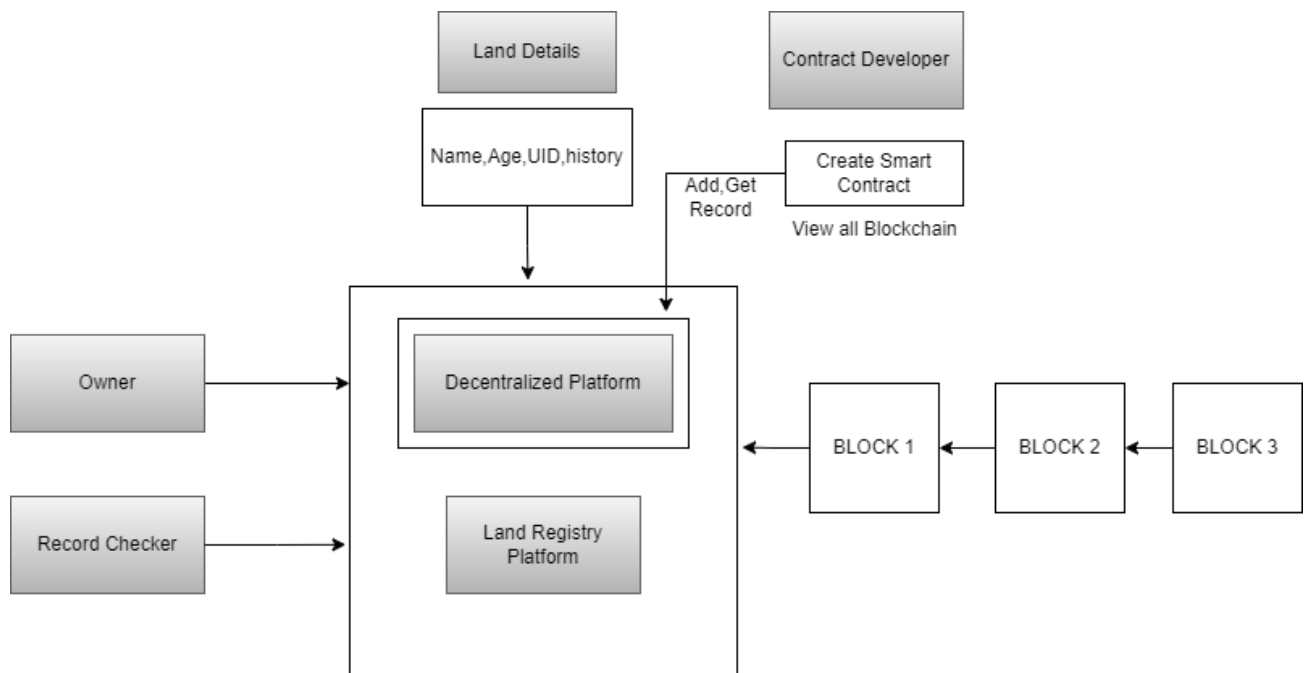
3.2. Algorithm and Process Design

Fig 3.1   Land Registry Process

3.3. Details of Hardware & Software

Hardware details:

- Processor: Intel(R) Core(TM) i5-10300H CPU @ 2.50GHz   2.50 GHz
- Memory (RAM): 8.00 GB DDR4
- Storage: 512 GB SSD
- **Software details:**
- Remix Ethereum IDE: For initial contract development and testing.

Programming Languages:

- Solidity programming language: For writing the smart contract.
- Ethers.js: For smart contract interaction.
- Front-end technologies (HTML, CSS, JavaScript, and frameworks) for the user interface.
- Truffle: For advanced development, testing, and deployment.

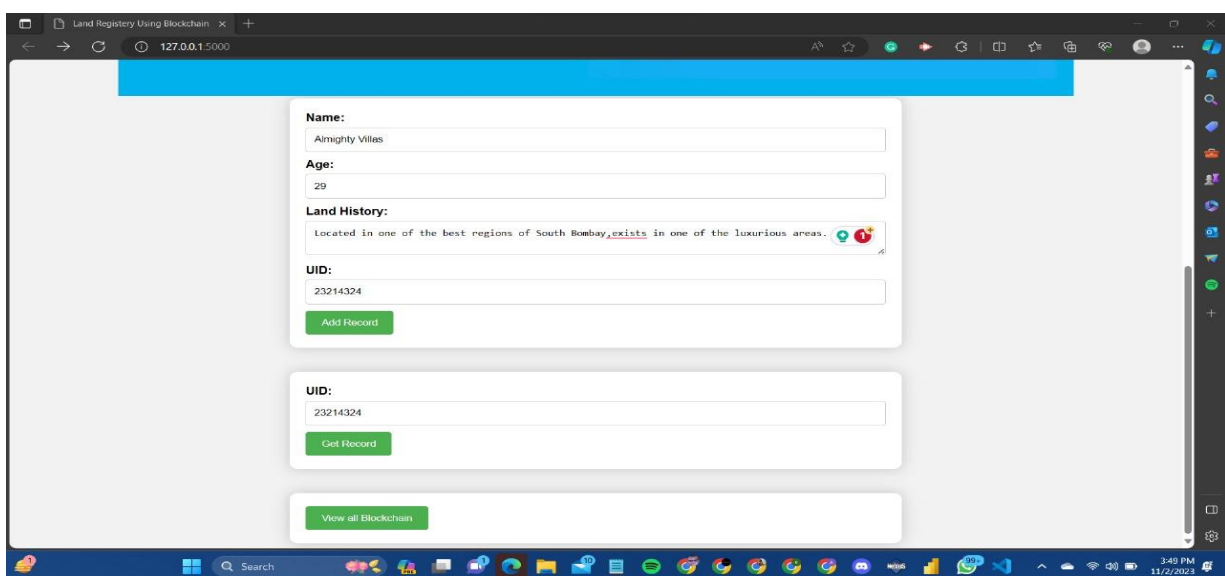## 3.4. Experiment and Results
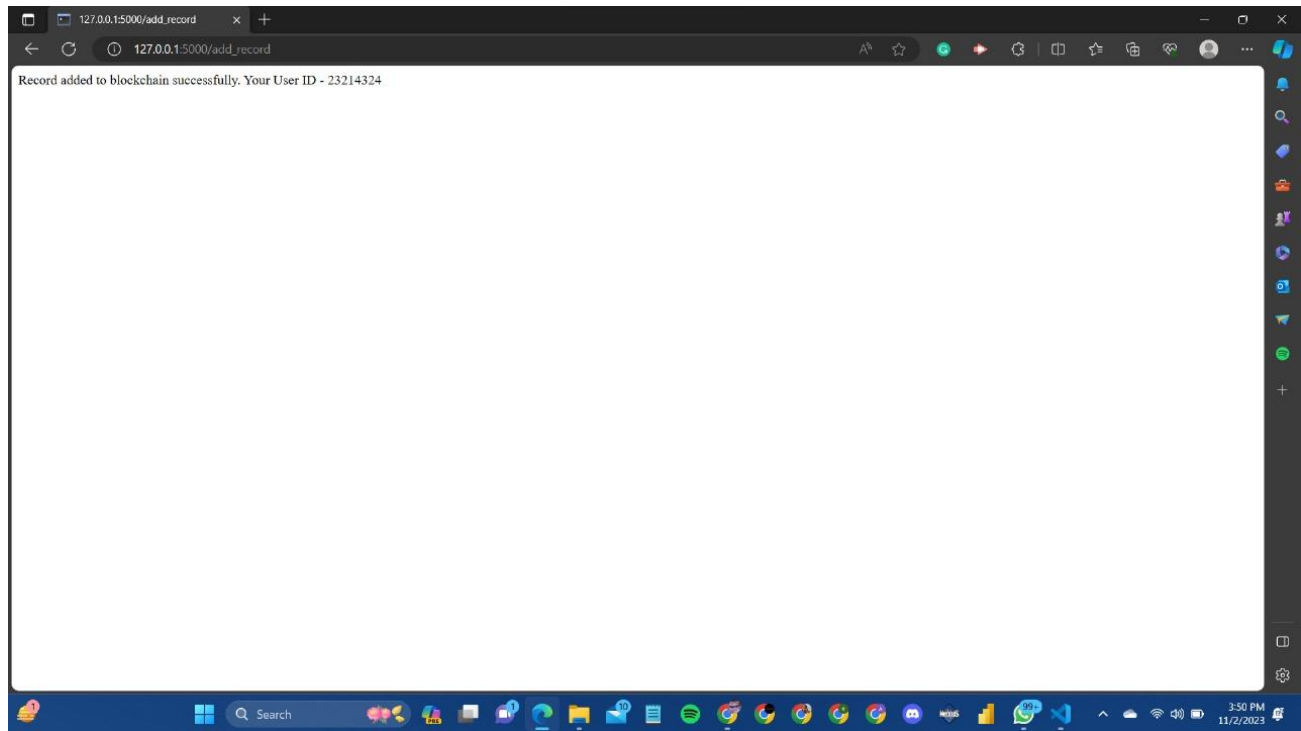

Fig 3.2. User Interface

Fig 3.3. Details of Land

Fig 3.4. Land's UID added Successfully

Fig: 3.5. Contracts Saved Successfully

3.5 Result Analysis

- The smart contract has been audited by a reputable firm and is free from known vulnerabilities.
- The project maintains high levels of transparency by publishing contract code and land contract public blockchain.
- The project effectively mitigated fraudulent activities and ensured secure land records.
- The system fully complied with local and national land registration regulations
- Ongoing maintenance and updates adapted to changing requirements and emerging technologies.
- Significant cost savings were achieved by minimizing paperwork and disputes.

3.6 Conclusion

In conclusion, the proposed system represents a groundbreaking approach to address the longstanding challenges associated with land management and ownership documentation. By incorporating blockchain technology, this initiative has the potential to revolutionize how land ownership records are recorded and managed. With a renewed emphasis on security, transparency, and efficiency, the project is poised to streamline land registration and transaction procedures, ultimately benefiting landowners, authorities, and the entire real estate industry. The potential for enhanced security and efficiency in land management and transactions is a beacon for a future where blockchain technology is an integral part of the land registry process.

References

[1]   Archana Sahai, Rajiv Pandey, Smart Contract Definition for Land Registry in Blockchain, 9th IEEE International Conference on Communication Systems and Network Technologies, 2020

[2]   Rijwan Khan, Shadab Ansari, Sneha Jain, Saksham Sachdeva, Blockchain based land registry system using Ethereum Blockchain, Journal of Xi'an University of Architecture & Technology.

[3]   Hartmut MÜLLER and Markus SEIFERT, Blockchain, a Feasible Technology for Land Administration? , FIG Working Week 2019 Geospatial information for a smarter life and environmental resilience Hanoi, Vietnam, April 22–26, 2019

[4]   Meghali Nandi, Rajat Kanti Bhattacharjee, Amrit Jha, Ferdous A. Barbhuiya, A secured land registration framework on Blockchain, 2020 Third ISEA Conference on Security and Privacy 2020

[5]   Krishnapriya S, Greeshma Sarath, Securing Land Registration using Blockchain, Third International Conference on Computing and Network Communication (CoCoNet'19)

[6]   Arif Furkan Mendi, Kadir Kaan Sakakl, Alper Cabuk, A Blockchain Based Land Registration System Proposal for Turkey, 2020.

[7]   Ali, Adnan Nadeem, Ali Alzahrani, Salman Jan, A Transparent and Trusted Property Registration System on Permissioned Blockchain, 2020.

[8]   R.C. Suganthe, N. Shanthi, R.S. Latha, K. Gowtham, S. Deepakkumar, R. Elango, Blockchain enabled Digitization of Land Registration, 2021 International Conference on Computer Communication and Informatics (ICCI – 2021), Jan. 27-29,2021.

[9]   Swapnil Soner, Ratnesh Litoriya, Prateek Pandey, Exploring Blockchain and Smart Contract Technology for Reliable and Secure Land Registration and Record Management, 2021.

[10]   Ameya Thosar, Mayur Harne, Ashutosh Sarode, Dr. Parminder Kaur, Land Registry Management Using Blockchain, 2021.