Land Registry Using Blockchain

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Abstract - An Any government system would be incomplete without the Land Registry system, which is responsible for maintaining vital data on the ownership, history of transactions, and other aspects of land. The current system has many flaws that increase the likelihood of dishonesty and disagreements. The use of blockchain technology has been predicted to create a safe and trustworthy land register system. Blockchain is being used in this instance as a cryptographically encrypted electronic ledger for digital documents and transactions. To close the gaps in the current land register, this system attempts to create a model for a secure and reliable land registration system enabled by blockchain technology.

Index Terms– Blockchain Land Registry ,Decentralized Land Ownership ,Smart Contracts in Land Records ,Immutable Land Title, Cryptographic Land Registration ,Distributed Ledger for Real Estate ,Transparent Property Ownership ,Blockchain-based Land Transactions ,Digital Land Title Management ,Secure Land Registry Systems

I. INTRODUCTION

The use of blockchain technology enables the creation of a decentralized and continuously expandable list of bookings, where proper state documentation is necessary due to the involvement of multiple participants in the bookkeeping process. This technology is known as Distributed Ledger technology, which can be used to book and document any kind of transaction. This technology allows for faster and more transparent processing of individual steps in the transfer of ownership process, giving all parties involved a real-time overview of the progress.

Land registry is a system that homes the essential information of land possession. Currently the entire process of land registry maintenance is to complicate since it involves safe keeping of large volumes of registers in written form. Existing system in not safe since many ways as majority of the process is not transparent, system is slow, and the trade of property more than once needs to be recorded accurately. To solve this issue, we are implementing blockchain technology, to counter these loopholes and find out the problems connected with land register system like mentioned above.

Blockchain is the distributed ledger technology that keeps historical record of all transactions that have taken place across a peer- to-peer network. Implementing land registry using blockchain helps inn avoiding fraudulent activities thereby making the system more secure. Documents provided by each user are verified directly by land survey department and on successful verification of documents, the landowner will provide with the unique ID which is attached with the land ownership document, and which will passed on to the next user after selling that land. This avoids reselling of same land. And by this being the online platform removes the need for a middleman or broker to sell or buy the land. This also records all the transaction history of each land and is secure.
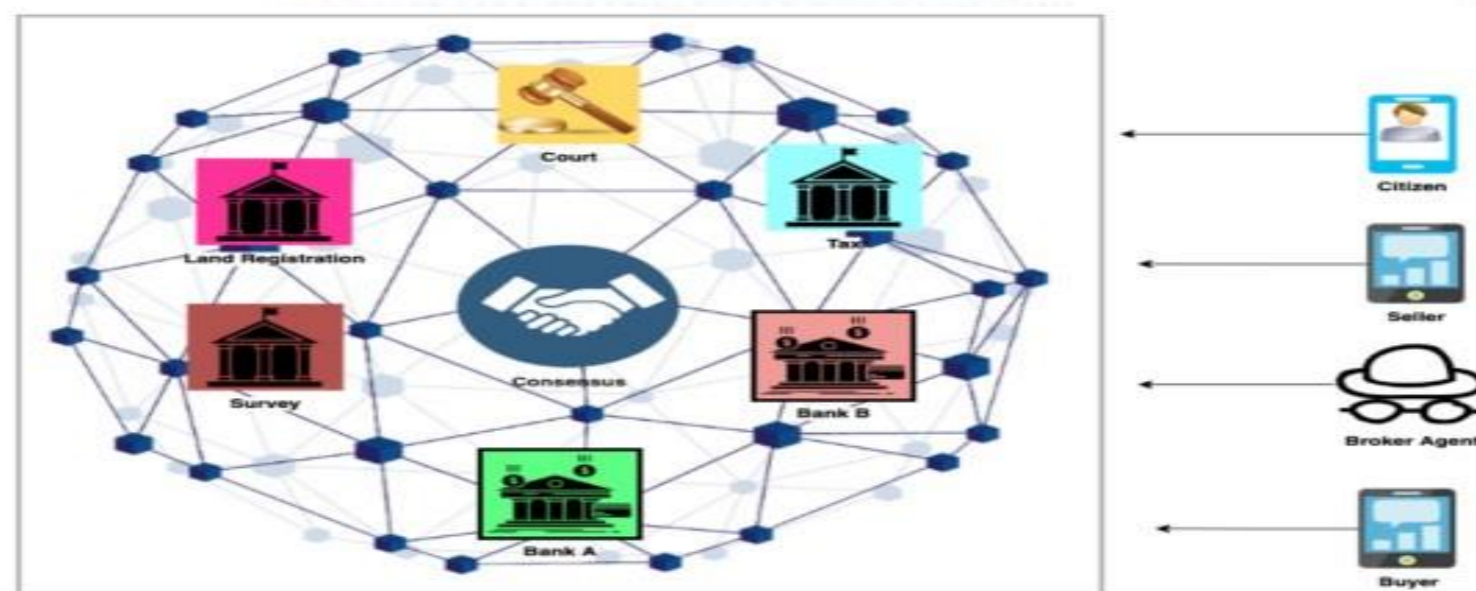

Fig 1: Blockchain Based Land Regristration System

II. LITERATURE SURVEY

Projects	Proposed Work	Review
A Novel Framework for implementation land registration and ownership management by Md Sakibul Islam, Fahmid Shahriar Iqbal	framework developed for land registration ownership and management using blockchain	Easy to use
Chain of Ownership by Hannah Natasha Hariharan, Abarnah Kirupananda	A Solution to reduce land forgery through a transparent land ownership portal	Helps to avoid the tampering of documents
Blockchain enabled digitization of land registration by RC Suganthe, N Shanthi, RS Latha	Digitalization of the present registry system	Makes the registration process faster

In current well-functioning Land registry systems transactions are physical in natures. The normal system indirectly affects the cost, paper resources, storage for huge record keeping, security problems with the records. Land ownership is one of the most controversial and combative issues in India today. India has many regional and territorial disputes. There are many disputes going on based on the ownership of the land.

The revenue department of Haryana made some progress in digitalizing the land registration by developing HARIS for registering property and HALRIS for managing the land records. Despite these advances, land registry process is still complex. For registration of documents, the authorized signatories of sellers and buyers must be present, along with two witnesses.

Blockchain provides transparency of the records, transactions. Over past five years, governments have deployed blockchain internationally to improve service and ensure the integrity of public records. The United Nations development program was particularly interested in developing a solution that would improve land registry in India. Block scale solutions worked in collaboration with the state government to working prototype of a blockchain enabled registry.

The proposed system mainly aims at providing the secure transactions, transparency of records. Digitalizing of documents prevent the loss of records. We are mainly focusing on digital service delivery and invest in reengineering processes to boost efficiency. Our system is incredibly economical, as it involves fewer human resources. This system is more reliable as compared to the past system.

III. TECHNOLOGY STACK

Smart Contact - The core of the entire project is a smart contract created in the computer language Solidity. It includes all the detailed guidelines and procedures that apply to property transactions. In essence, a smart contract is a self-executing digital contract that, upon the fulfilment of specified requirements, autonomously enforces the terms of the agreement.

Decentralised Application - DApps, are programmes that employ blockchain technology to give users access to a decentralised and trustworthy platform. DApps operate in a transparent, auditable, and immutable manner, unlike conventional applications which are governed by a single entity.

IPFS -A decentralised and distributed file storage system called the Inter Planetary File System (IPFS) can be used to store and exchange data of all sizes. It is founded on a peer-to-peer (P2P) network, where every node is equal, and no single node has control over the data.

MetaMask- 16 -The native cryptocurrency of the Ethereum blockchain, Ether, can be safely stored, managed, and transferred by users using a software cryptocurrency wallet, which is a digital wallet. These wallets are frequently offered as computer programmes that may be downloaded and set up on desktop or mobile devices.

Sepolia Testnet - Developers often test a smart contract on a Testnet before releasing it on the Ethereum Mainnet. A unique kind of blockchain network called a testnet is created with testing and experimenting in mind. They use test Ether rather than actual Ether, which is why they sometimes go by the names "fake" or "play" networks even though they imitate the capabilities of the Mainnet.

Truffle suite - Developers must extensively test a smart contract to make sure it is reliable and useful. An effective tool for this is Truffle Suite. It has an environment for building and deploying smart contracts, an Ethereum asset pipeline, and automated contract testing.

Flutter - The frontend of the project has been developed using Flutter, an open-source cross-platform software development kit (SDK) created by Google. Flutter allows developers to create applications that can run on multiple platforms, including Android, iOS, Web, Windows, Linux, and Mac OS, using a single codebase. This reduces the development time and costs and makes it easier to maintain the application across multiple platforms.

web3.js - A JavaScript package called Web3.js is used to communicate with the Ethereum network. By delivering queries using the JSON-RPC protocol, which enables frictionless connection with the Ethereum nodes, it enables developers to engage with the Ethereum network. For transmitting transactions, reading data from the blockchain, and developing smart contracts, the library offers a straightforward and user-friendly interface

IV. METHODOLOGY

User registers themselves to the system/website, on successful registration the user is directed to the dashboard. Here on dashboard the user can add, sell, or buy the land and also view their previous history of transactions made, if user owns property, then they have to add their land details and get the land verified from the land department. Land department initially verifies the documents provided by the user. And on successful verification they will provide each user the unique ID which will be attached to that land document and whenever this property is sold this unique ID along with ownership will be passed to the buyer. When a user initiates a buy request this request will be notified to both the seller and the land department and will be further processed by land department. After verification of the land and payment medium the land ownership along with unique ID will be transferred to the buyer with consent of both buyer and seller.

1. Proposed solution for the system

Blockchain and Web3 Blockchain technology works by using a peer-to-peer net work to create an immutable ledger of transactions. These transactions are then verified and stored by an ever-growing network of computers. Each node (computer) in the network stores a copy of the ledger, and the ledger is updated when ever a transaction is made. This makes it virtually impossible for hackers to tamper with the data. Furthermore, the technology is also used to create smart contracts, self-executing agreements between two parties that are enforced without needing a third party. This makes the technology ideal for a variety of applications, such as in the financial services, healthcare, government, and supply chain industries. .

2. Implementation details

Initially, the end users of the land registry system ie, Land owners, Land Buyers use our web platform in order to buy or sell a land. We use blockchain to safely handle the transactions involved in this process. The Land Department inspects the requests raised by the sellers and buyers, verifies the users and approves the valid transactions. If the user wants to add the land in their dashboard the user sends a add request to the land department by sharing the documents and on successful verification from the land department the land department issues an Unique token which uniquely identifies each land and avoid document tampering and duplication.

Fig 2: Basic Function of system
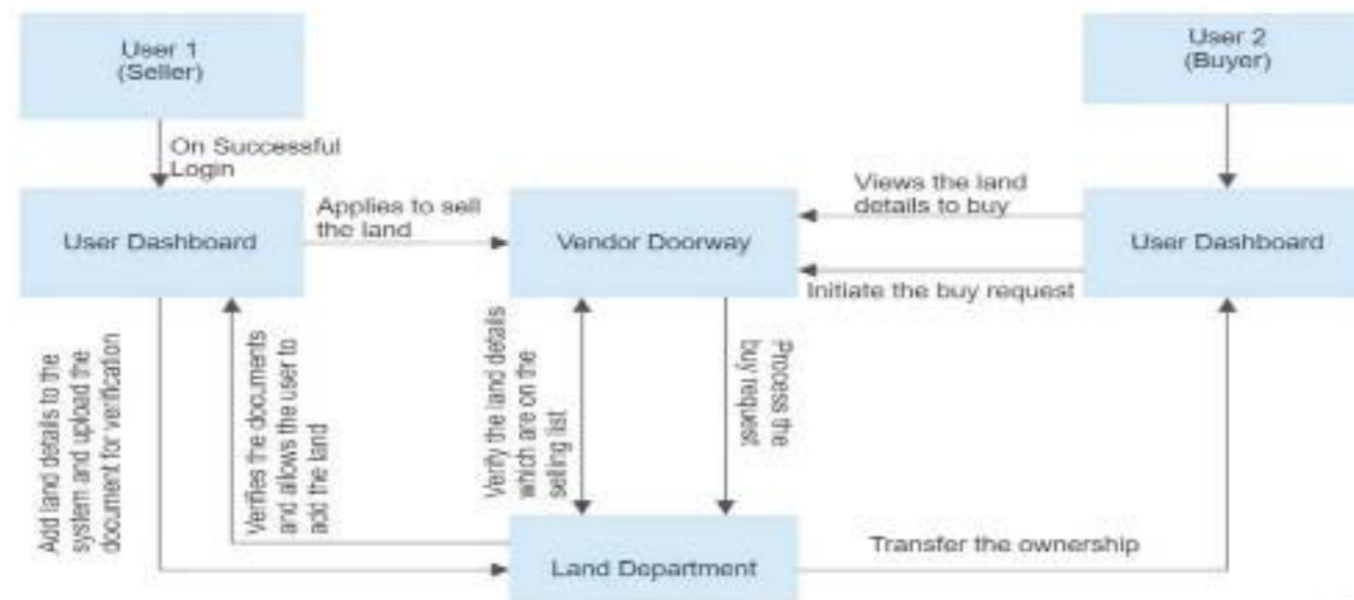
V. CONTRIBUTION TO SOCIETY AND ENVIRONMENT

● To make the process land registry quick, easy and simple.

● To prevent people from fraud and scam.

● Mindful use of resource like paper, manpower by digitalizing the process.

● Reduce the work of land department by digitalizing it and reducing the cost of maintenance of record. To maintain the previous history of land in digitalized form so that document is free from fear of loss.

● To make the process of land registry transparent.

● To make the process of land registry available to everyone at their fingertip.

● To provide secure transaction to user. Efficient use of energy and resources.

VI. CONCLUSION

In summary, the use of blockchain technology in property registration has the potential to completely transform the current system by offering a safe, effective, and transparent solution that is advantageous to all parties involved in real estate transactions. The transparency of blockchain technology is one of its distinguishing qualities. A distributed network of computers is used to record transactions on the blockchain, making it difficult for anyone to tamper with or corrupt the data without being detected. This means that in the context of property registration, all process-related transactions, such as ownership transfers, are documented on the blockchain ledger. It becomes challenging for anyone to conduct fraud or indulge in any unethical practises related to property ownership because the ledger is tamper-proof and available to all parties involved in the process.

The blockchain will for instance immediately identify any attempt to sell a property that the seller does not actually own because the ownership records of the property do not match the seller's identity. Similar to how if someone tries to alter the ownership records, everyone in the network will be able to see the change and the attempted alteration can be stopped. Overall, the transparency offered by blockchain technology increases the security and dependability of the property registration process while lowering the dangers of fraud and unethical behaviour associated with poor financial management.

VII. REFERENCES

1. Siddhant Chatterjee, Ayesha Shaikh, Anjali Singh, Pravin Jangid, Land Registry System using Blockchain (2022), volume 09. Anthony Williams Deep Center, India's Land Registry using blockchain (2018)
2. Mohammed Shuaib, Salwani Mohd Daud, Shadab Alam, Wazir Zada Khan, Blockchain based Framework for secure and reliable land registry system (Oct 2020), volume 18
3. Hannah Natasha Hariharan, Abarnah Kirupananda, Chain of ownership-A solution to reduce land forgery through a transparent land ownership portal (2021)
4. Roopa, R.C. Suganthe and N. Shanthi, "Blockchain Based Certificate Verification Using Ethereum and Smart Contract", Journal of Critical Reviews, vol. 7, no. 9, pp. 330-336, 2020
5. N. Shanthi, R. Suvitha and R.C. Suganthe, "Blockchain Based E-Voting Approach in P2p Network", Journal of Critical Reviews, vol. 7, no. 9, pp. 337-342, 2020.
6. Sahai and R. Pandey, "Smart Contract Definition for Land Registry in Blockchain", 2020 IEEE 9th International Conference on Communication Systems and Network Technologies (CSNT), pp. 230-235, 2020.
7. Kaczorowska and Maria, "Blockchain-based Land Registration: Possibilities and Challenges", Masaryk University Journal of Law and Technology, 2019