

Land Registry Using Blockchain

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Abstract

Blockchain technology and distributed ledgers are attracting massive attention from academia and trigger multiple projects in different industries. In industries that need to be protected against corruption, human error, or human intervention, it takes a comprehensive approach. One application that involves many intermediaries in order to put trust in the system is Land Registry. The existing solutions in place are outdated. Land registration generally describes systems by which matters concerning ownership, possession or other rights in land can be recorded (usually with a government agency or department) to provide evidence of title, facilitate transactions and to prevent unlawful disposal. The most common method for processing transactions and confirming asset ownership in the modern world is intermediation. Along a network of intermediaries, intermediaries carefully examine each party involved. However, this is time-consuming, expensive, and carries a credit risk in the event that a middleman fails. The current land registry system is rife with corruption and inefficiencies. With blockchain, we have a chance to overcome these issues.

Keywords: Blockchain, land registration, buyers, sellers, registrar, cryptography

1. Introduction

The Land Registration process currently requires a lot of paperwork. The primary issue associated with the land registry is the use of printed documents. It is challenging to keep a track of who is the owner of which tracts of land or property when there are hundreds or even thousands of years' worth of land records. It's possible to encounter factual inaccuracies in the paperwork, such as falsified credentials, fraudulent titles, and, in extreme circumstances, a permanent loss of all paperwork. Conflicted parties engage in expensive and lengthy

court disputes as a result of these circumstances. In this context therefore, it is easy to see the relevance of a blockchain-based land registry to be developed and more so to developing economies. A blockchain is a type of distributed ledger technology that consists of a growing list of records that are securely linked together using cryptography. A timestamp, transaction information, and a cryptographic hash of the prior block are included in each block. Each and every transaction in the public ledger is verified using consensus protocols involving the majority of the participants of the system. Blockchain's immutable, auditable and traceable features attract governments all over the world to implement the decentralized technology in the land registry process. Using the blockchain technology it is possible to build a land registry and a history of transactions that can be easily verified at any given point. So, in this technological era there is a need for implementing land registry using blockchain.

2. Objectives

The objectives this project aims to achieve are:

1. To develop an access database to store land titles and transactions.
2. To provide high capacity and throughput for millions of records.
3. To make the data immutable thus bringing trust and auditability to the records.
4. Quick retrieval of transaction histories.

3. Literature Survey

The blockchain can act as a worldwide data repository that guarantees transparency. There are four major types of blockchains: public, private, hybrid, and consortium. Decentralization in blockchain enables it to run without a central authority and thus it cannot be controlled, censored, or shut down. However, adding information to the blockchain is considerably slow, Ethereum requires

around 15 seconds. Another limitation is that in the process of mining blocks, only the quickest node wins while the time and energy spent by the other nodes get wasted [1]. Blockchain can be integrated with a wide range of different fields, including machine learning, IoT, data analytics, etc., to address security, confidentiality, and authentication-related challenges. Depending on the type of newly emerging data, different blockchain systems handle various real-time scenarios. For instance, it has been proven that Ethereum is effective in improving security, but scalability is still a challenging attribute to be proven decentralized technology in the land registry process. [2]. The Bitcoin blockchain space cannot be used for publishing arbitrary information. Thus, information to be published is hashed and those hashes are embedded into transactions. Transparency and the use of cryptographic primitives for authentication eliminate potential failures [3].

4. Proposed System

For countries without adequate land management, the challenge is not simply to develop a land registry system but to develop a system that is reliable, effective, and free of corruption. Currently no solution exists to the problems faced in the existing land registry system. Thus, our proposed system aims at building a real time record maintenance system that captures various attributes of land by using blockchain as its key technology. The system will let users buy and sell land securely while maintaining authenticity of the ownership.

The proposed system will typically be carried out in the following steps:

Step 1: The users have to register on the portal for buying properties.

Step 2: The properties will have to be registered for listing them on sale.

Step 3: The registrar verifies the seller and buyer along with the sale deed.

Step 4: The transactions verified by the registrar are stored on the blockchain.

Limitations:

1. The registrar has to accept and reject requests based on the details uploaded by the requester every time.
2. The land verification may take time depending upon the circumstances.

5. Methodology

User: For buying land

1. The user will register on the portal.
2. The user can view the marketplace and check the different properties listed.
3. As per his requirements the user can select the land to buy.
4. On selection of land, the payment can be made.
5. When a user buys property, registration need not be requested as it will already be a part of the blockchain from the seller's end.

User: For selling land

1. The user will register on the portal.
2. For registered property, the user can list it out for sale.
3. If the property is not registered, the user will have to fill in the required details and documents and request for registration.
4. Upon completion of the registration process, the property can then be listed for sale.

Registrar

1. The registrar will login into the portal.
2. He can view the registration requests on the dashboard.
3. The registrar can accept and reject requests based on the details uploaded by the requester.
4. The accepted requests will be stored as a block in the blockchain.

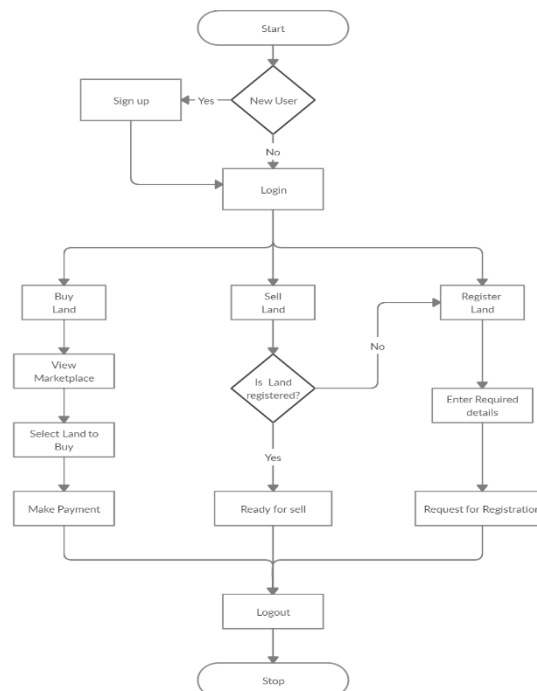


Fig. 1. Flow chart: User

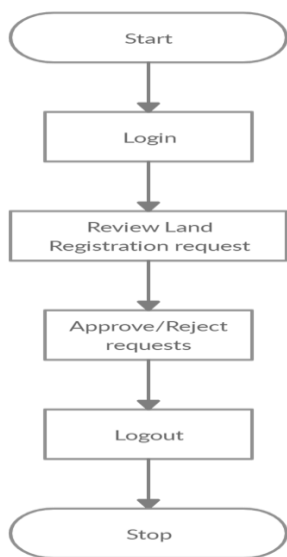


Fig. 2. Flow chart: Registrar

6. Results and Discussion

Currently, the proposed system can be used to authenticate and validate property ownership and allow the user to put up properties for sale. As the verified user ownership information gets stored as a block in the blockchain, it becomes secure due to the security aspects of the blockchain. The information will be available to different departments as per their usage. The resultant system will serve as an easy, quick, and cost-efficient record maintenance and retrieval system.

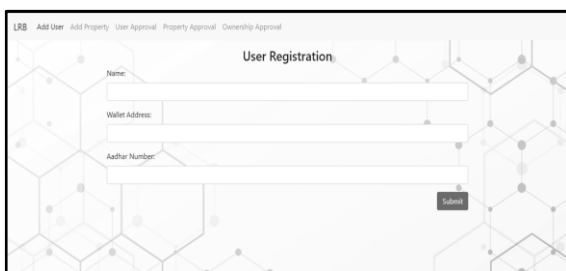


Fig 6.1 Registration page where super admin or admin can add new users

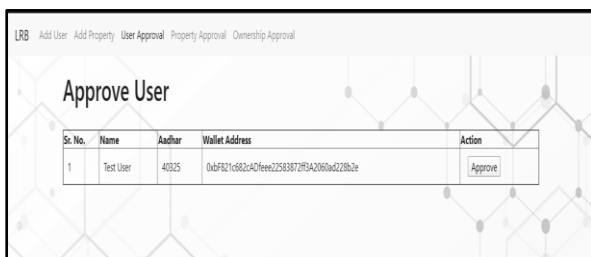


Fig 6.2 Once the user has been registered by the super admin or admin, he has to be verified by the super admin to grant him access to the portal.



Fig 6.3 Super admin or admin can add a property for the user.

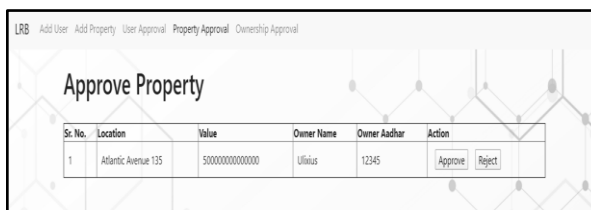


Fig 6.4 After the creation of the property, it needs to be approved for being listed in the dashboard. Only after the property has been approved, it can be requested for a change in ownership.

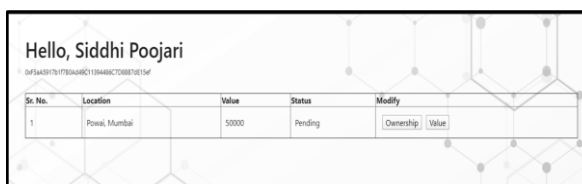


Fig 6.5 User dashboard



Fig 6.6 Users can change or transfer the ownership rights to other users registered and verified on the platform

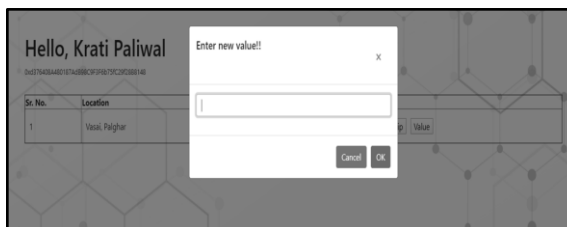


Fig 6.7 Change property value



Fig 6.8 After a user request for the change of ownership of property super admin has the right to accept or reject this request.

7. Conclusion

The traditional land registry system is prone to various types of tampering at every stage and indirectly affects the cost as well in the form of paper resources, storage requirements of vast record keeping, and the security issues of these records. The system is also time-consuming and requires more time to verify and update the records which gives rise to bribery and the chances of double spending increases. These issues affect the economy, and people are skeptical about investing in land trading.

The Blockchain-based Land registry system will facilitate the integration and validation of land records over a given region. The system allows users to buy, sell and register new properties. It is easy to use and a secure way of buying and selling land. Blockchain provides the key feature of security which allows the registrar to validate the user's authenticity in a hassle-free way. As the verified user's record is

entered in a block in the blockchain it can surely be relied upon.

The problem of discrepancies and false records is eliminated in our system. Thus, it can be guaranteed that the property listed by a user belongs to him only. This makes the system trustworthy.

8. References

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