LAND REGISTRATION SYSTEM USING BLOCKCHAIN

[1]Mr.C.Gouri Sainath & [2]N.Uma, [3]P.Vandhana & [4]A.Sai Vishnu Vardhan

[1]Associate Professor, Department of Information Technology, CMR College of Engineering & Technology

[2, 3, 4] B-Tech, Department of Information Technology, CMR College of Engineering & Technology

ABSTRACT:

In the traditional Land Registration system practiced in India, there exists a middle man (broker) who establishes a contact between the buyer and seller, for instance if an individual wants to buy or sell a property ,the broker will create and assemble all the obligatory physical documents with regards to an agreement as a proof of property. Brokers will ensure that the land/property would be registered by an authorized government office where all the attributes are noted down in a ledger and thereafter the whole transaction and purchasement between the two parties takes place. In this scenario ,there are chances of losing or tampering of the documents as anyone with certain powers can access or alter the papers easily which inturn threatens this concrete proof of land.Thus, this type of system as compared to our proposed system in which we make use of a smart contract to deal with the assets and transactions among the participants, is relatively time consuming, less secure and unsynchronized where activities including corruption and fraudulence might be associated during the execution of the required process. With an amalgam of inspection and analysis regarding the old accustomed way and considering that Blockchain has an increased transparency and integrity maintenance along with the portability factor, we put forward a blockchain based land registration system which provide a transparent, secured and decentralized method for execution of transactions between the participants by employing the concept of hyperledger.

INTRODUCTION

Blockchain is an emerging platform for developing decentralized applications and data storage among the shared parties with all recorded transactions that have been executed through- out the process. Each and every transaction in the public ledger is verified using consensus protocols involving the majority of the participants of the system. As the new data is emerging blocks are created and encrypted using hashing algorithms. Thus, the information entered once cannot be modified without consulting a legal administrator.Blockchain allows one to create a ledger of events, transactions and data, generated through

various IT processes with strong cryptographic guarantees, that is distributed and replicated across the network for tamper resistance, immutability and verifiability. It is a distributed digital ledger that is open, shared, transparent and highly secured which means all the transactions or records processed are immutable and verifiable. As the name indicates, blockchain allows a block of data to grow as new blocks are appended to it, with each block containing transaction information stored in a specially designed data storage structure.In this system, users would register on the portal and can take up the role of a buyer or seller accordingly. The seller needs to upload all requisite details whereas the buyer can then buy the lands on the portal that are verified by the smart contract. Further users can get deeds digitally which will be uploaded as a new block in the chain. In this way this proposed system does not involve any middleman and all transactions are directly dealt between the buyer and the seller. Transactions will be backed up in all legal servers of all the parties involved in a cryptographic format and the audit ability of transactions will be stronger now that they are associated with timestamps.Business runs on information. The faster it's received and the more accurate it is, the better. Blockchain is ideal for delivering that information because it provides immediate, shared and completely transparent information stored on an immutable ledger that can be accessed only by permissioned network members. A blockchain network can track orders, payments, accounts, production and much more. And because members share a single view of the truth, you can see all details of a transaction end to end, giving you greater confidence, as well as new efficiencies and opportunities.Digitalization and the development of new technologies is the strongest force of change in society. In the old accustomed system, if a user lost original physical agreements which acts as concrete proof of the ownership or if documents get altered or damaged then it is very difficult to navigate all the details in regards with the assets. Traditionally it takes a huge amount of time for verification of owner, land papers manually which in turn slows down the legitimate transactions. Another alarming concern is that of fraudulent activities including hampering, bribery, forgery or alteration carried out by middle agents in the process which results in lack of security.

OBJECTIVE:

We advocate a decentralized system or peer to peer system which does not involve

a middleman for making deeds and all the transactions are directly dealt between buyer and seller using digitally created and verified agreements. So this updated system can avoid fraudulent activities as blockchain uses hashing techniques and any alteration is recorded.All changes are stored in the next block so that no user is unaware of the current state of any asset and all transactions are stored in a blockchain with appropriate timestamps associated with them for strong auditability.

Project Scope And Limitation

- The Land registration system incorporating blockchain using blockchain provides features like registration of owner and land by uploading mandatory verified documents.
- After verification of the owner/land using smart contract using smart contract and consensus protocols implemented in the model , land can be put up for sale and then assets will be visible to all the potential buyers.
- Simultaneously the sale revenue of the land including stamp duty, cost of the land as per the official criteria and registration fees is calculated automatically and the final selling cost of land is generated.
- After agreement between both the parties, purchasement of land gets completed and transactions are recorded and added to the blockchain. Thus, this system stores the history of transactions and backup data in blocks which are immutable.

Introduction

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fig 1: Traditional land registration system

Merits, demerits and challenges

- Practiced from ancient times and there is no need to know about current technologies.
- It is a centralized system.
- Huge cases of claimers posing as the seller of land or property. Thus increases the chances of fraud cases.
- Middlemen or brokers are involved.
- It is a time-consuming process.
- The land registry system is paper based. Hence the chance of bugs increases in the land registry system.

PROPOSED SYSTEM:

In recent times, a lot of problems are faced by commercial real estate industries and land registration systems where even though the data is in digital form , they are stored on disparate systems and thereby lack transparency, trust and efficiency. We propose a private and permissioned blockchain system that restricts the participants who can contribute to the consensus process,to overcome the obstacles faced earlier as mentioned Our blockchain system makes use of Asymmetric cryptography for security of users and distributed consensus algorithms for ledger consistency. The main features of blockchain technology are decentralization, persistence, anonymity and auditability and an amalgam of these results in reduced cost and improved efficiency, reliability.In our portal, we register land users by taking into account all their credentials and mandatory verified documents where the admin invokes the smart contracts aPut for Sale ˆ a and ˆ aChange of Ownership ˆ a for the purpose of selling and ˆ buying the land. Once all the necessary conditions are met then only the user is eligible to buy or sell the land. After the completion of the transactions one can view all the transaction history including all its previous owners, the date of purchasement and summary of all land details. The lands are displayed area wise or land id wise as per the useras convenience. Thus our system works efficiently and caters to the need of a modified and decentralized land administration system.

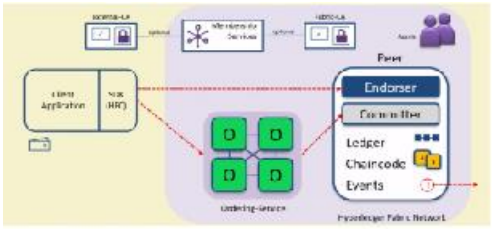

Fig 2: Hyperledger Fabric Architecture

1) Propose Transactions : The Client Application proposes a transaction to multiple endorsing peers. The number of peers is determined by the endorsing policy. The client application needs to satisfy this Endorsement policy to communicate with enough peers to collect endorsements.

2) Execute Proposed Transactions : Each of the endorsers has to execute the transactions proposed. Each execution will capture read and write sets. Once captured these sets are collected for the transaction and each endorser will sign it.

3) Proposal Response to Client : Endorsers communicate back to validate the output with their signature. The client or SDK will now receive the read and write sets asynchronously.

4) Ordering Transactions : Once the client gets sufficient endorsements according to the endorsement policy, it will submit the transaction to the ordering service. Multiple client applications or users across the network simultaneously send their transactions to the ordering service. Ordering service determines how to order the transactions and also ensures that all peers on the network can see the same order.

5) Deliver Transaction : Ordering service delivers ordered sets of transactions(block) to all the peers in the network, it asks them to add this block to their blockchain.

6) Validate Transaction : All peers receive a block of transaction, but not all transactions in the block are valid because some of them do not get sufficient endorsements. When all peers on the network come across such invalid transactions, they reject or mask that transaction.

7) Notify Transaction : All peers, on a per peer basis, commit a set of valid transactions(block). This block is then added to the blockchain and each block emits events to notify that the block has been added. Events may be block events, transaction level events or smart contract events.

Designing

UML Diagram

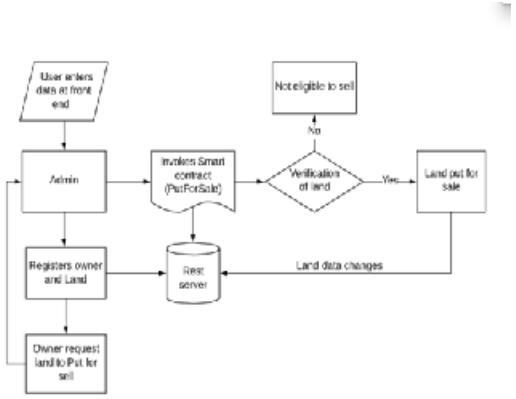

fig 3: UML Diagram

Results and discussions

In the above mentioned existing systems as compared to our proposed system in which we make use of a smart contract to deal with the assets and transactions among the participants, is relatively time consuming, less secure and unsynchronized where activities including corruption and fraudulence might be associated during the execution of the required process. With an amalgam of inspection and analysis regarding the old accustomed way and considering that Blockchain has an increased transparency and integrity maintenance along with the portability factor, we put forward a blockchain based land registration system which provides a transparent, secured and decentralized method for execution of

transactions between the participants by employing the concept of hyperledger.

Output

Now-a-days all applications which require huge security are migrating their application to Blockchain as Blockchain inbuilt security for data. All existing techniques were not having any facility to check whether data stored at decentralized (same data will be saved at multiple nodes and if one node hacked or down then data will be gathered from another working node) server is intact or changed. To check data is intact we can use Blockchain technology to maintain land registration details as this technology maintain tree to store each transaction (any data storage will be considered as transaction) and while storing new data then Blockchain verify all transaction hash code and if data is not alter or hack then same hash code will be generated and verification will be successful and new block will be added and if data is changed then different hash code will be generate and verification will be failed which indicate node is hack.If we manage land registration details in Blockchain then users can verify data from any other working node upon failure of other node. Blockchain also supports tamper or alter proof storage as the data store in Blockchain will get verified upon adding a new transaction and if any data block alter then verification will be failed and the user can understand his data is altered.

1) Blockchain maintain each transaction/storage in blocks
2) All blocks may store inside MERKLE TREE
3) Before adding new block Blockchain will verify all blocks hash code and each block may have
link to previous block and current block
4) If any block data is altered then its hash code will change and verification will be failed.

To implement this project we have designed following modules

1) Admin: admin user can login to application by using username as admin and password as
admin and after login admin can add new land registration details and then can search land
details. Admin will issue registration numbers to each user..
2) User module: Users can search registered plot details by entering plot registering number.

Below screenshots showing code of Blockchain Algorithm

4.3 SCREEN SHOTS

To run project install python 3.7 and then install DJANGO server and then create Python folder inside
system ‘C’ directory and then put ‘LandRealState’ folder inside that C:/Python folder and then start
DJANGO server by double clicking on ‘runserver.bat file. Now open browser and enter URL as
http://127.0.0.1:8000/index.html and press enter key to get below home page

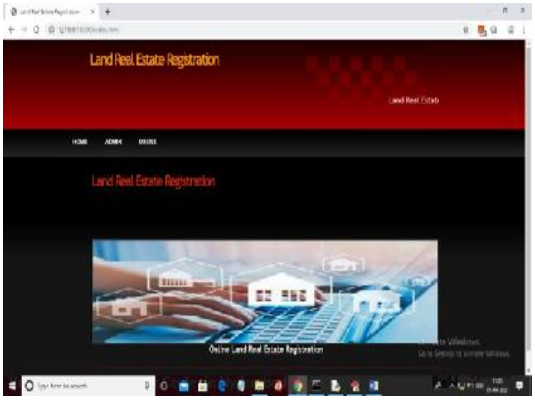

fig 4: Home Page

In above screen click on 'Admin' link to get below screen

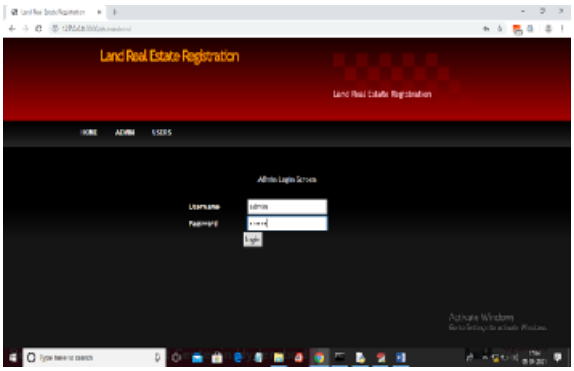

fig 5: Admin Login Screen

In above screen enter username as 'admin' and password as 'admin' and then click on 'login' button to get below Admin Screen

CONCLUSION:

Blockchain is one of the most secure ways of storing data without it being changed. It is a distributed ledger that is open to anyone and once data is put into it, it is very difficult to change or meddle with it. Using this property of blockchain we want to put it to use into one of the most fraudulent systems in India, the Land Registration System. Our system uses blockchain with the employment of hyperledger. This gives rise to a system that is more evolved and features all the activities like buying and selling in an efficient and reliable way. Blockchain technology made this system secure and faster. If this kind of system is upgraded further and integrated with a useful API then this will lead to faster transactions and will eventually lead to easement of the entire process, thus making the entire system hassle free and convenient in the long run which would be beneficial to mankind.

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