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Land Registry Verification System

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Abstract: Creating a land registry system to upload the data on blockchain using IPFS and verify who is the current owner of land with the help of transaction id(hashcode).
It helps to reduce frauds on property, to detect unnamed properties and reduce property disputes.
Correctness is guaranteed as we are using blockchain so there is no chance of repetition of uploading data and data will be immutable.

I. INSTALLATION GUIDELINES

Install MetaMask. If you do not already have MetaMask installed, please go to https://metamask.io/ and follow the instructions.

1) The first dependency we need is Node Package Manager, or NPM, which comes with Node.js.
2) Next we need to install the node modules : $ npm install
3) Install Create-React-App and other dependencies using NPM. Use NPM and install the following:

```
$ npm i create-react-app
$ npm install react-bootstrap
$ npm install fs-extra
$ npm install ipfs-api
$ npm install web3@^1.0.0-beta.26
```

II. INTRODUCTION

Web3.js is overridden as we have to use version 1.0 of web3.js but in metamask default version is 0.20 so we have to override it. Another file storehash.js is created in order to give access to web3.js to the contracts we have loaded from Ethereum's Rinkeby testnet.

The decentralised app is created to make the land registration and land transaction transparent and decentralised..It's main feature is that we can build our applications in a modular fashion which helps in reducing code repetition and makes it easier to debug. The ethereum solidity contract in the back-end makes the decentralised app and transparent. It consist of various variables such as:-

1) *ipfsHash:* It returns the hash generated from IPFS which guarantees that our land record
2) is uploaded.
3) *transactionHash:* It returns the transaction hashwhenever the transaction is completed.
4) *txReceipt:* It is generated only when the transaction is completed.
5) *Transaction:* The transaction hash number can be used to generate a transaction receipt with information such as the amount of gas used and the block number.

Some important methods which is used are as follows:-

a) *send():* This method is used here to send the hash code generated from ethereum contract.
b) *captureFile():* This method is used here to load the file which we are uploading on IPFS and send it to convertToBuffer method.
c) *convertToBuffer :* It will send the uploaded file to the buffer.
d) *onSubmit():* This method get user's metamask account details and then calls other method to perform uploading of data on IPFS and starts creating hashcode and at last gives transaction receipt which is given to used as their unique id and confirmation code that their record has been uploaded on blockchain.
e) *Software Required:* Solidity Compiler, Metamask, Web3 Js, Node JS, Rinkeby
f) *Hardware Requirement:* 8 GB Ram, Permissioned BlockedChain Network Architecture, Good Internet Connectivity, Biometric Verification Device

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A. Existing System

1) *Verbal Contract:* Both the seller and the buyer can have a verbal agreement over the purchase or sale of the land. This might involve conducting physical inspection of the site and negotiations over pricing.
2) *Preparation of Contract:* Once the contract is verbally agreed upon, it needs to be recorded on paper as well. This is done by preparing the sales document. The document can be prepared by anyone, however, it is advised that you seek assistance from a lawyer to ensure authenticity.
3) *Pay Stamp Duty:* Once the deed is made, you are required to pay the stamp duty. The stamp duty value may range from 3-7 percent depending on the state.
4) *Execute and Register Sale Deed:* The next step is to execute the sale deed and register the same visiting the Sub-registrar of Assurances office and submitting all the relevant documents. In Gujarat, it is necessary to submit the photograph of the plot, meanwhile, in Maharashtra, you need to submit a property card, 7/12 extract document.
5) *Property Mutation:* The final step is to get the mutation of the property done in the land and revenue records. This can be done by visiting the local municipal authorities.

B. Proposed System

Blockchain is used to upload the land record using IPFS. The existing solutions in place are out of date. Tracking who owns which pieces of property is challenging when you have thousands of land records to maintain. It is quite common to confront discrepancies within the paperwork such as counterfeit titles, forged documents and a complete loss of the record. Such situations lead to expensive court battles between conflicted parties.

The transparent nature of blockchain can make it possible to trace how property changes hands. Blockchain's immutable, auditable and traceable features are enticing governments around the world to implement the decentralized technology in the land registry process.

III. WORKING

Whenever we want to search land records first we have to start IPFS server which will be started by NPM command. It generates a URL to access the server and host IP address When IPFS server gets started then the first page will be opened where we can choose the file to upload the land record which we want to upload on IPFS server and we will get a transaction hash which will be used further if we want to check or verify whether our land record is genuine or not by some other person if they want to cross check for our land records.

Here Metamask uses Ether virtual money to upload the data on blockchain, here we will get block number too which is the serial number of block where the transaction or our land record is stored.

Now as the data is uploaded on blockchain so now if someone wants to verify whether our land record is genuine or not they can cross check by going to testnet Rinkeby. etherscan and add add our transaction hash (which we got during uploading of land record on blockchain) in the URL to retrieve the input data that we have uploaded on the blockchain server.

After doing this we will get the data in read only mode which cannot be edited but only viewed and this way it verifies that the land record which we showed to the buyer is genuine and if the land record was fake then the data would not have been retrieved on Blockchain.

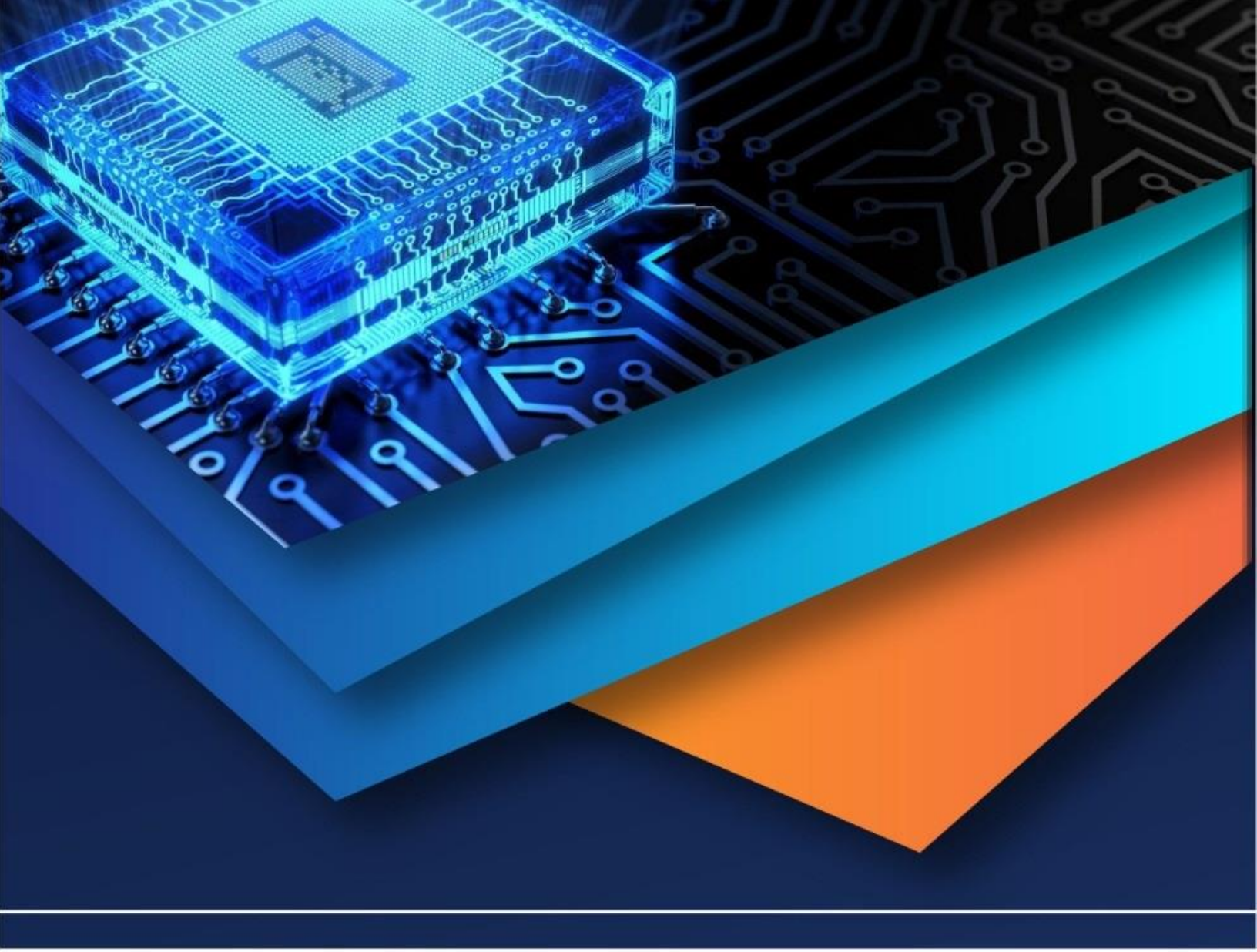
IV. CONCLUSION

When land records are loaded on blockchain there is no need for a third party to verify them. This will help to remove the participation of multiple agents in land selling/buying. It will help to remove the fraud which actually happens with the help of fake land records and cheats the person. With the help of this project people can verify the land record whenever anyone is selling the land and check whether their land is genuine or fake. This will help alot is removing fraud along with extra fees of agents that are also reduced as now buyers and sellers can directly interact and verify and do their transactions.

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