

Blockchain Based Land Registration System

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Abstract In the real-estate field, it is very important for the land to have accurate records which identifies the current owner and as much of the ownership history as possible, which is not been perfectly existing in the current world. As land registration involves number of intermediaries to trust the system, a centralized one which is volatile and mostly tracking of the ownerships is highly tricky and leads to court battles. Rather, what if we have a system which could handle the property registrations and title transfer process? “**Blockchain Technology** using [Smart contracts](#) “

Using a Programmable Blockchain, **Ethereum**, developing a Land registration system which could handle the land registrations and title transfer process having real time track of previous ownerships of the land as well as immutable land insights.

Keywords: Ethereum, ledger, Smart contracts, ERC 20, MetaMask, Ganache, lite-server, truffle framework.

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1. INTRODUCTION

Land registry in India as well as in many parts of the world is very slow and cumbersome process. There are also many intermediaries involved in the process of land registration. Developing a system that not only accelerate the process of land registration, but also make it easier for Buyers, Sellers and Government registrars to transfer the land ownership from seller to a new buyer, is only possible by creating a distributed system that store all the transactions made during the process of land buying. In this project we'll try to explore the possibilities and problems solved by using a blockchain based system for land ownership transfer. The system that we are trying to implement is based on Ethereum Blockchain that will store all the transactions made during the process of land ownership transfer. Using the concept of smart contracts of blockchain technology we can triggers various events like registering users on to the system and transfer of land ownerships by land inspector and fund transfer event from buyer to seller after successful verification of the land ownership transfer. This system will solve the problems faced by all the three parties during the land registration and will also remove the intermediaries like property dealers. This system makes the process of land registration resilient and decrease the cases of fraud in the process. Using the system, validation of the lands is also possible as immutable transactions are being stored in the public ledger.

For land, being a high-valued asset, it is very important to have accurate records which identify the current owner and provide the proof that he is indeed an owner.

These records can be used to:

- A) Protect owner's rights
- B) Prevent sale frauds
- C) Resolve disputes
- D) make sure ownership is correctly transferred to a new ownership

Currently people rely on third party, i.e., government agencies that are responsible for keeping track of ownership information. This third party keep all the records in the centralized database. Hence to transfer the ownership, it becomes difficult and slow to first find verify the land and then transfer the ownership. It is possible to keep track of the property ownership if we have a distributed system which stores all the land history and share it among the interested buyers. This would remove the intermediaries. And seller can directly contact the buyer.

2. DESIGN

The Blockchain technology ensures the two main factors **Trust** and **Intermediaries**

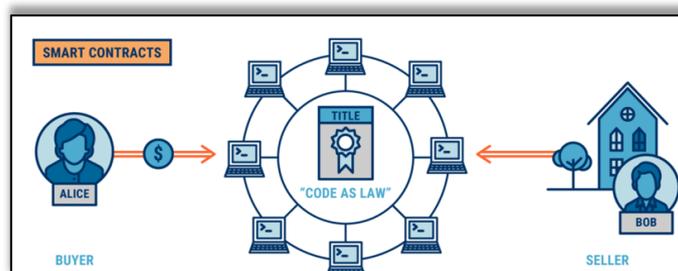
It itself doesn't create trust whereas the working principle does and the concept of not having Intermediaries is such a thing which makes a blockchain a new mode of conducting transactions independent of any third-party. Blockchain like Ethereum replaces intermediaries with smart contracts which execute the protocols automatically when developed.

In our scenario of Land Registrations:

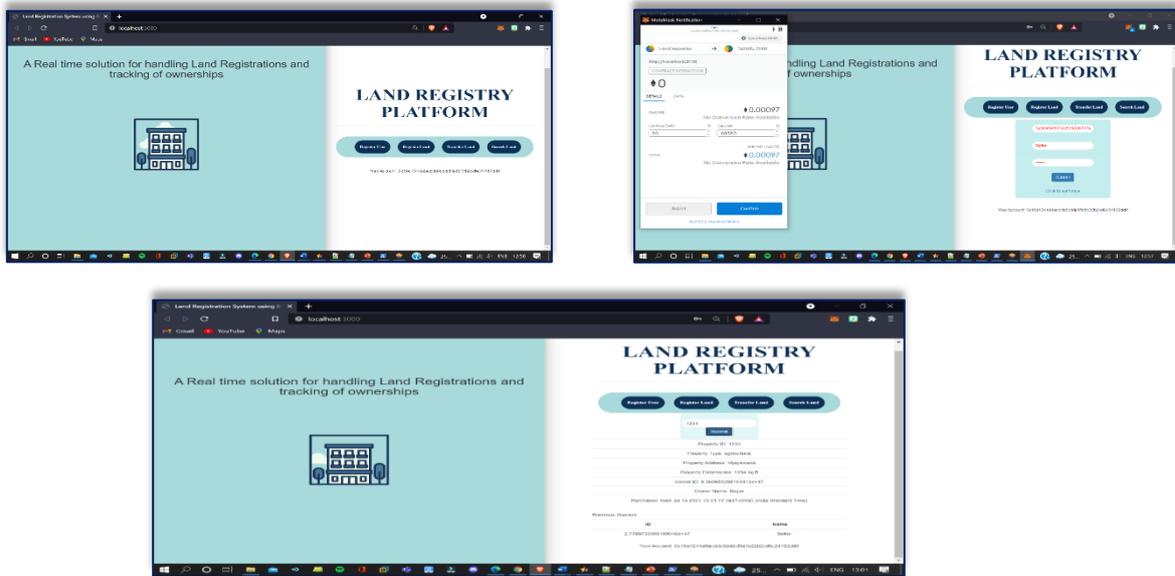
1. Accelerates the process
2. Reduce Fraud cases
3. Brings transparency with smart contracts

Also, the Blockchain is a tamper-resistant process and this makes a user more comfortable to buy, sell or to get details about the land and its purchase history. The Land registry method can be simplified by applying blockchain technology and can be a secure, fast, and transparent way to operate the system.

1. The land registry in Blockchain, the property owner, can automatically check their own and whether they are eligible to transfer the legal ownership to others or to sell the property.
2. The Buyer and the Seller, both parties, are the user in the blockchain channel and can get easy access to each other, as it connects users over the single platform.
3. The verification of property and the land records becomes very accessible and very easy.
4. Once the verification gets complete, the users who are buyers and sellers can quickly move to the next process of registration that is the transaction.
5. The Purchase of land or asset gets executed by using a smart contract.
6. The payment process automatically gets completed by transferring the amount from Buyer's Bank to the seller's bank.



Figure



3. ANALYSIS

India has land disputes over all the levels of courts, comprising of discourse over a land of 2.5 million hectares involving 7.7 million people, which contains a total of 66% of all the pending court 2.3 million cases in India. An average pendency extends from an average of 20 years, from the undertaking till the last hearing resolution. Authenticity in land registration is, therefore, posing as a significant challenge in the country. The critical process in land registration is the sale deed process, which involves five significant organizations, which include the government, two parties of interest, banks, registrar, witnesses and other minor organizations such as stamp vendors, agents, advocates, document writer. These process affects the efficiency in transferring the ownership of land from one party to another, drastically as it can take almost 30 days in transferring total property, which poses a risk in the data loss or modification.

Nakamoto et., [1] proposed a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and re-join the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone

Buying a piece of land in India is very crucial and you need to pay due diligence to the entire process. Especially, you have to make sure all the papers are clear from title defects and other legal issues. It is best to register your land with the help of reputed legal professionals and lawyers as they scrutinize each and every document and offer the advice on whether to proceed further or not.

Blockchain in the land registry has been an essential aspect of today's world. Once the land transfer task completes, the information automatically updates and saved on that blockchain platform, and this process is the safest and tamper-free mode of the operating system. No one can change the legal right of the ownership, and no one can damage the data asset; others cannot make a change in that transaction and ownership. The history of past transfers of ownership uses to help in verifying the current legal owner of the land. There is no need for authority in the Blockchain, which is a huge advantage in today's world. There is no requirement of middleman or authority and is simply called as Decentralized ledger. The term blockchain has been gaining popularity because of success, such as Bitcoin, Ethereum, and Hyperledger fabric.

The use and implementation of Blockchain in the land registry and its assistance in maintaining the land records are quite transparent. Blockchain helps to make the process of land registry transparent, straightforward and more accessible. It is very useful in the land registry where this application enables us to know how, when, where, which, etc. about the land title. It also empowers us to know if there had been any activities in a particular land. It shows every record of the land registered. This application will indeed take us towards development and easy accessibility to life not only for us but also for the future generation.

Procedure for land registration: Document verification: As the first step, all the documents related to the land should be verified.

- a) Drafting of the deed: Irrespective of the way you have obtained the land, it is important you have the correct deed. For instance, if it is a gift, a gift deed is required. If it is a purchased one, a sale deed mentioning the contract, payment, terms

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and conditions agreed by the seller and the purchaser, tenure of the payment, etc. Encumbrance certificate: This document confirms that the land has no legal liabilities like loans and mortgages.

- b) Preparing stamp paper: To execute property transaction and related documents like conveyance deed, sale deed and sale agreement, a fee has to be paid to the government. It is called stamp duty. You need to get the stamp paper from authorized vendors.
- c) Execution of the deed: The deed must be executed at the Registrar's office and both the parties have to be presented to duly sign the documents. If anyone of the parties either seller or purchaser is not available, then a Power of Attorney can be given to proceed with the execution.
- d) Registration: As a final step, once all the documents are reviewed and found to be perfect, the land will be registered. Personal documents like PAN, Aadhar, etc. Unlike residential and commercial buildings, for land, there is no field inspection by the authorities.

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Barbieri M, Gassen D [2] Blockchain-based approach to registering property titles could significantly increase the efficiency of conveyancing and even prevent fraud. 3 It is also alleged that property transactions could be handled on a blockchain in a similar way to payments between parties using digital currencies.4 In simple terms, a blockchain is a type of distributed ledger of digital records or transactions that is accessible to all computers running the same protocol.

Graglia JM, Mellon C [3] Real estate transactions currently depend on a number of intermediaries, including brokers, government property databases, title companies, escrow companies, attorneys, inspectors, appraisers, and notaries. In the short term, sharing contracts and approvals in real time will reduce delays caused by mailing and delivery.

Benbunan-Fich R, Castellanos A [4] The analysis of these two cases helps to identify enabling and constraining factors related to the digitalization of public records and the adoption of land-registry blockchain initiatives. While these projects do not rely on invention of new technology, they do require process redesign and technological readiness.

4. RESULTS

Blockchain in the land registry has been an essential aspect of today's world. Once the land transfer task completes, the information automatically updates and saved on that blockchain platform, and this process is the safest and tamper-free mode of the operating system. No one can change the legal right of the ownership, and no one can damage the data asset; others cannot make a change in that transaction and ownership. The history of past transfers of ownership uses to help in verifying the current legal owner of the land.

5. CONCLUSIONS

The term blockchain has been gaining popularity because of success, such as Bitcoin, Ethereum, and Ethereum ledger. The use and implementation of Blockchain in the land registry and its assistance in maintaining the land records are quite transparent. Blockchain helps to make the process of land registry transparent, straightforward and more accessible. It is very useful in the land registry where this application enables us to know how, when, where, which, etc. about the land title. It also empowers us to know if there had been any activities in a particular land. It shows every record of the land registered. This application will indeed take us towards development and easy accessibility to life not only for us but also for the future generation.

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