



Land Registration Platform

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ABSTRACT—

A "broker" serves as an intermediary between a buyer and a seller under India's conventional system of land registration. For instance, if someone wishes to purchase or sell a piece of real estate, the broker would gather all the physical documentation required to prove the transaction. Brokers ensure that the land or property is registered by a reputable government body, where all the details are recorded in a ledger, and that the complete transaction and sale between the two parties takes place after that. There is a chance that the documents will be lost or altered in this scenario since anybody with the required authorization may easily access or edit the papers, harming the physical evidence of land.

Therefore, compared to our recommended approach, which employs a smart contract to manage assets and transactions among users, this type of system is slower, less secure, and unsynchronized. Additionally, it makes it more likely that fraud and corruption will occur when the appropriate procedure is carried out. In order to resolve these challenges, a crucial component of important government resources from the legal executive and policing are needed. Blockchain technology may be able to overcome these restrictions and resolve problems with the land library system, such as how records are handled and how to sell the same piece of land to many buyers. We suggest a blockchain-based land registration system that makes use of the hyperledger idea to offer a transparent, safe, and decentralised way for participants to carry out transactions. This is accomplished by a mix of examination and analysis of the already employed technique and taking into account the fact that Blockchain has enhanced transparency, integrity maintenance, and portability in addition to the mobility aspect. The use of Blockchain to create a secure and reliable land library architecture has been suggested in this article. The suggested structure provides a computation for pre-understanding and makes use of the concept of dazzling agreement at various stages of the land library. We first describe the conventional land library structure and examine its problems. Then, at that point, we established a structure and framed the potential benefits of utilising Blockchain technology in the land library framework.

Keywords: *Blockchain, Land, Hyperledger, land registration, secure*

1. Introduction

The term "land register system" refers to the database used by various governmental entities to track ownership entitlement information. The saved record may be utilised as the evidence of eligibility to prevent any fraud and provide a seamless transfer as needed. The outdated land records make it difficult to confirm the ownership of the land and may even result in fraud. Over 70% of the population, according to a survey by the World Bank, lacks a land title. The idea of having access to land is crucial for a citizen's social and economic resiliency .

Governments will benefit from the safe and current land record in terms of tax collection, service delivery, and other areas of governance . The global bank is aggressively pursuing this goal, offering assistance to nations that want to improve their land registration systems, supporting conferences, and undertaking initiatives to modernize land registration. Several government organisation are investigating and working towards a safe, trustworthy, and tamper-proof digital system for the land record. The process involves a large number of parties, which makes it difficult and necessitates several checks and balances to protect against various risks and foster an atmosphere of trust. The blockchain-based solution is suitable for situations where several companies are cooperating and conducting transactions.

The Fundamentals of a land registry system can be mainly into five sections:

A :The primary goal of the land register system is to locate the legitimate owner of the property, after which the necessary paperwork is submitted for registration. The user identification procedure is not yet widely accessible or standardized .The design of the currently available blockchain technology makes it unnecessary to reveal the user's identify

B :Initial transition process:

C :Consent Principle: To transfer the land to the buyer, consent from the actual owner as shown in the land registry is required. The following are the key problems that have been found during this process:

D :Finding the true owner.

E :All users/owners have access to digital signatures. The system or middleman to confirm the coercion/transfer threatened without consent. The blockchain is designed to cut out any middlemen, however coercion cannot be verified in this situation .

2. Related Work

[1] Smart Contract Definition for Land Registry in Blockchain:

The current Land Registration System makes transferring property ownership in connection with a land transaction a time-consuming process. Because all of the country's data is kept in one location, there are security concerns as well. In some instances, improper or incomplete registration results in land litigation and ownership disputes. In this work, a block chain-based land registration system is proposed to get around the land registration system's aforementioned drawbacks. Data on landowners can be safely stored to prevent overlapping claims to the same parcel of land thanks to the decentralised data storage offered by block chains. Because land is a valuable resource, the application of block chain technology can enhance both the characteristics and the way this sector operates.

[2] A secured land registration framework on Blockchain:

A very valuable immovable, non-liquid asset is land. Maintaining the accuracy and correctness of property ownership/transfer data is a very difficult undertaking. The work of maintaining detailed and extensive ownership transfer records is onerous since the ownership of property might change over time, and sometimes quite often. Due to the existence of false or incomplete registers, which are exceedingly difficult to track down over time, the issue only becomes worse. As a result, ownership issues in the system result in litigation that lasts for years and wastes significant time, energy, and resources trying to resolve them. The majority of the difficulties arise from the present land registration systems' legacy paper document trails or from poorly maintained records.

[3] Blockchain based land registry system using Ethereum Blockchain:

Consumption patterns have altered as a result of Blockchain technology is increasingly being used. This technology can be used in the land registr system, for example. Some nations have already used blockchain technology for land registries or are working on initiatives that will make use of it. There are questions, meanwhile, regarding whether blockchain can offer the security, cost savings, and openness required for land registration transactions. It is critical for both established and emerging economies to properly register immovable properties in land registers and to consider the rights associated with them. As a result, a number of states have already invested a large amount of money in land registry research. One of these states is Turkey. Additionally, great progress has been achieved in the continuing, since the Republic's founding, land registry initiatives.

[4] A blockchain based secured land registration system:

Only a select group of cutting-edge technologies will be responsible for the Fourth Industrial Revolution. Countries with a greater chance of success in the near future are undoubtedly those that are well-trained and prepared to accept these technologies. One of the main underlying infrastructures of this revolution is considered to be blockchain. A number of nations have begun investigating the useful use of blockchain technology due to its tremendous potential. However, one of the most alluring industries where blockchain excels is land registration administration. Blockchain technology offers the potential to address some of the significant flaws in Bangladesh's present land registration system. The intersection of these two dots will allow us to employ blockchain for a safe and transparent system.

[5] JAPAN (PROJECT STATUS: INITIAL STAGE):

Instead of the existing framework, where a few services and land organisations have their own distinct land record framework, the Japanese government has initiated a blockchain-based initiative that would record all of the land records on one stage. The new framework has been tested in a few urban areas as a pilot project, and if the results are promising, it will be implemented at the public level within the next five years. Aside from government initiatives, a real estate company by the name of Zweispac has started a blockchain-based secure framework for the appraisal and exchange of property that may greatly reduce the time cost of moving.

[6] REPUBLIC OF GEORGIA (PROJECT STATUS: COMPLETED):

A pilot project developed by the Bitfury Gathering, the Public Organization of the Public Library (NAPR), and the Blockchain Trust Gas gas for a blockchain-based land naming system in the Republic of Georgia. The Georgian government hopes to restore public faith in foundations and governmental institutions by using Blockchain technology to lead in administration and security. The Public Organization of the Public Vault (NAPR) and Bitfury Gathering promoted a Blockchain-based land titling system in the Republic of Georgia in 2016. The present land library framework was given a blockchain-based time-stepping throughout the project's main phase to make it safe and unrefutable. The procedure of buying and selling land was made accessible in the second stage using blockchain technology The exchange fee for bitcoin has been reduced to about 0.1 percent of land value. Every single record may be created online and obtained using open blockchain.

[7] RUSSIA (PROJECT STATUS: DEVELOPMENT):

Service of monetary turn of events and exchange of Russia has begun a project that will use a blockchain-based architecture to record all land titles and collaborate with a web-based safe exchange of land data. All data will be transferred to a blockchain-based platform in the primary stage, where you may verify all land records, previous owners, potential risks to the property, and other information. crucial criterion, it performs the least well of the essential

variables. It was discovered that engaging with highly specialised consultants, promoting user purpose, and creating an appropriate annual budget might all assist boost senior executives' confidence in their ability to successfully implement the systems.

[8] SWEDEN (PROJECT STATUS: TEST PHASE) The Swedish land-possession authority Lantmäteriet in participation with telecom firm Telia, counseling firm Kairos Future and blockchain organization Chromaway has fostered a blockchain based project for land library. The venture will be three layered. In the main stage a trial was directed to test the mechanical advantages and in the subsequent stage finished up with distribution of report that show the advantages of involving savvy contracts in land exchanges. In the third stage, real exchanges were made utilizing computerized marks and shrewd agreement. The framework is presently being assessed and when the outcomes are agreeable, it will carry out.

[9] BRAZIL (PROJECT STATUS: TEST PHASE):

A blockchain based framework for land library has been created by the Brazilian land enlistment center workplaces in combination with a U.S. organization called Pervasiveness LLC. In two Brazilian districts, Pelotas and Morro Redondo, the venture is now being tested with the goal of making all land records and exchanges completely paperless and defilement-free. An equal framework is being created concurrently with the current land library framework at the underlying stage, and later on all records will be transferred to a blockchain-based framework, as it were.

3. Methodology Used

During the course of land exchanging, the purchaser and merchant need to consent to a set-up agreement (shrewd contract) and afterward further send the solicitation of move to the library office. The vault office confirms the personality of merchant and purchaser then check the land title with the assistance of assessor and departmental records. When the validation and confirmation are finished, the monetary exchange record is checked, and required income as move charges and expenses are gathered then the exchange demand further cycles. In the wake of finishing this multitude of steps, the proprietorship is moved, and the possession declaration gave to the purchaser, and the refreshed record shipped off completely concerned divisions. The check of vendor and purchaser is finished with the assistance of pre-arrangement ID that stores the dealer and purchaser ID and understanding subtleties.

4. IMPLEMENTATION

We will have a distributed system that will keep all the transactions completed during the land purchase process, and the finished result, or model, will be a smart contract written in the computer language Solidity. Additionally, this will facilitate the transfer of land ownership from the previous owner to the new owner and speed up the registration procedure for purchasers, sellers, and government registrars.

The system's roles are as follows:

- Buyer: Buyers must register themselves by submitting official government documentation. The accessible land will then be visible to him.
- Seller: The seller must register himself as a vendor and add images and documentation related to the property. Additionally, he must locate the land on a map.
- Land inspector: A representative of the government department in charge of land registration, he examines the paperwork after any seller confirms a buyer's desire to purchase land.

Step 1: Users register on the platform

- Users who want to sell or buy property register with the blockchain land registration platform.
- They can create a profile on the platform with details such as name, official ID and options. A hash of personal information submitted by the user is stored on the blockchain.

Step 2: Sellers upload certain products to the platform • Sellers can upload photos and information to the platform and mark the location of the land on the map. The transaction corresponds to the seller's right to save the details of the property recorded in the blockchain

- Once the content of a property is uploaded to the platform, it is available to all users registered as buyers.

Step 3: buyer requests access to listed property

- Buyers interested in a particular property can request sellers to access its properties.
- A device access request has been reported to the vendor. They can be rejected or accepted based on the buyer's profile.
- The buyer can view previous ownership information for this property and submit a purchase request and initiate a transfer
- Transactions corresponding to requests from buyers and sellers are recorded on the blockchain to ensure authenticity and traceability.

Step 4: Vendor Approved Change Request, Realtor Receives Notification

- If the Vendor approves the change request, the Real Estate Agent receives a notification to initiate the changes. The smart contract is designed to give land researchers access to land data.

- After the realtor checks the documents, he arranges a meeting with the buyer and seller.
- Discussions have also been added to the blockchain to resolve future disputes

Step 5: Cadastre Specialist observes and initiates the transaction

- Cadastre Specialist verifies the information submitted by the buyer and seller and adds the information to the blockchain land registry platform first.
- The buyer and the seller sign the transfer documents in the land registry in the presence of the cadastre.
- The signed document gets saved in the database and transaction corresponding to it is recorded on the blockchain.
- The transfer is initiated and smart contracts trigger to send funds to the seller and title's ownership to a new buyer.

Step 6: Verification and authenticity of the land registry document

- In case of any disputes, any authorized party can upload the signed land registry document to the platform to check its authenticity and confirm it.
- If the hash generated after uploading the document is the same as the hash generated at the time the document was signed, then the document is verified and no modifications have been made to it.

Signing the Documents: After the buyer and seller sign the documents, the land purchase is completed. Transactions involving signatures and changes in land ownership are recorded on the blockchain.

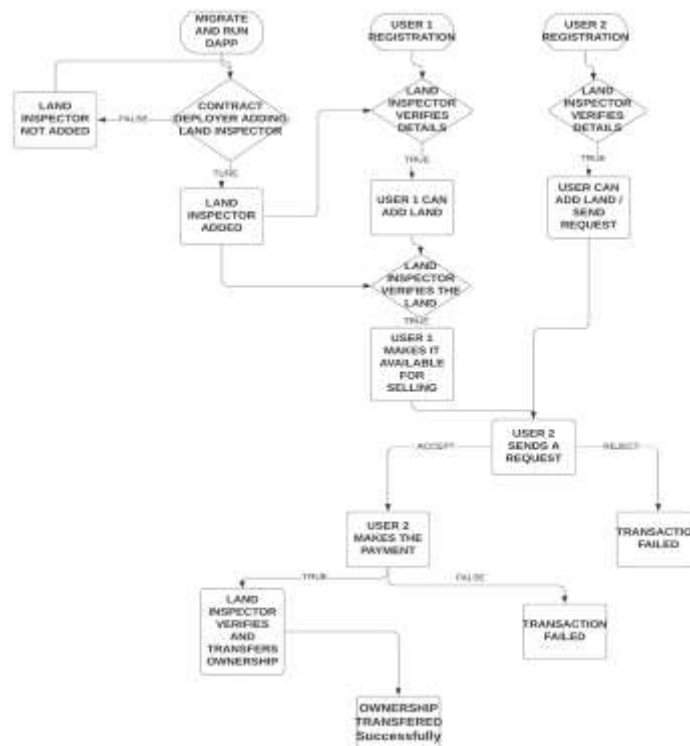
After the land is transferred, the app will create a digital signature and cut it to file.

Seller can see purchased land in My Lands option

User can now add his land. They can add all the details of the terrain, the terrain information and the user can also draw the terrain on the map as shown in the image below.

All of the above transactions will be stored on the Ethereum blockchain and further assistance can be provided in case of disagreements over certain plans or other issues.

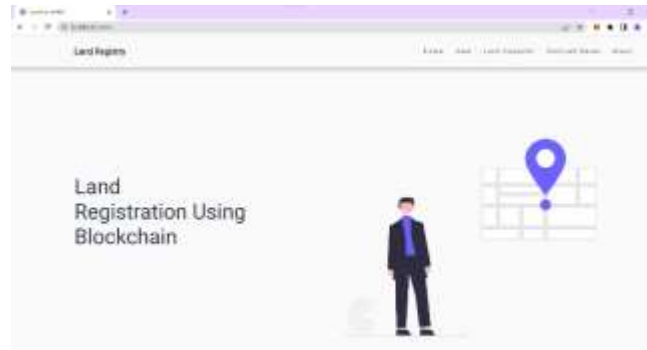
is made for the creation of immutable computer files.



(i) System Architecture

5. Results and Discussions

- Login Screens



- User Dashboard



- Land Inspector Dashboard



- Contract Owner Dashboard



- Mapbox:



6. Conclusion

This article examines the trends and difficulties facing conventional subterranean libraries today. The conventional procedure frequently results in different modifications at each level and also has an impact on the value of information assets, the capacity to store extensive data, and technological security challenges for this data. The structure is very complicated and necessitates large expenditures for study and renovation, which might pay off twice by selling the same plan to many customers at once. People are hesitant to invest in the land barter system, which inhibits the flow of money during the economic cycle from impeding the growth of all nations, as a result of these challenges that are harming the economy. As anonymized assets rise, these problems also have an impact on the allocation and monitoring of tax revenues and illicit funds for the government. Innovation on the blockchain can address these issues. In order to handle important challenges like change, capital doubling, and the nearly successful reorganisation of knowledge in the land, this study suggests a stable and sustainable land bank model. Because it involves less human intervention and is more dependable, planning is relatively affordable. Additionally, this paper offers a computational method for comprehending prior transactions between buyers and sellers. We go into great length on the ageing process of data ownership and the best way to recycle this data through various interfaces (offices).

Future design and computation processes will take place in a real-world environment.

7. Future scope

This technique is time-saving, stress-free, self-satisfying, and doesn't require any outside authorisation. It is also entirely online. Not only would becoming paperless simplify the procedure, but it will also protect the ownership documents from different man-made and natural calamities. The issues with land registration in India and many other countries will no longer exist thanks to this platform. System with government APIs since we are now required to deliver transactions using all of the documents that have previously been personally verified by the authority using our existing system, which is subject to deployment. This allows us to quickly and automatically verify the users' behaviour. Individuals who speak their native tongues can also use other languages characteristic of translation. Finally, we can expand our system with new features to make it more stable and approachable while keeping track of a piece of land's whole history.

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