Securing Land Registry System Using Blockchain

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Abstract— The current land registration process has many flaws that people use to cheat the public and governments. This section explains By implementing the land registry on the blockchain, the security problem will be solved to a large extent. The hash value calculated for each block is unique because it is linked to the hash of the previous block. The algorithm used for hashing is SHA256. Along with SHA256, a Proof of Work (PoW) algorithm is also used to make the information about each transaction more secure. The message digest generated per block is of fixed size, and each hash represents the complete set of transactions within a particular block. The proposed land registry blockchain network consists of 12 nodes that compute proof of work. Nodes are responsible for validating transactions, mining new blocks, and adding new blocks to the blockchain. A total of 200 real estate transactions are recorded using blockchain techniques to provide tamper-proof and updated versions of land registers. An elliptic curve cryptography algorithm is used to generate the signature and is used to verify whether the transaction was signed by the owner. Merkle trees are used to link transactions using hashes, reducing disk usage. Therefore, the proposed implementation of land registry using blockchain involves 99 effort to record.

INTRODUCTION:

Blockchain is a new platform for distributed application development and data storage among shared parties, with every recorded transaction performed throughout the process. All transactions on the public ledger are verified using a consensus protocol involving the majority of participants in the system. As new data appears, blocks are created and encrypted using a hashing algorithm. Therefore, information once entered cannot be changed without consulting the Legal Manager. Blockchain enables the creation of a ledger of events, transactions, and data generated by various IT processes, with strong cryptographic guarantees, distributed and replicated across networks to be tamper-proof, immutable, and auditable. ensure the integrity of It is an open, shared, transparent, and highly secure distributed digital ledger. This means that transactions or records processed are immutable and auditable. As the name suggests, blockchains grow blocks of data as new blocks are added, and each block contains transaction information stored in a specially designed data storage structure. The system allows users to register on the portal and play the role of buyer or seller accordingly. Sellers need to upload all the necessary details, while buyers can then purchase parcels validated by the portal's smart contract. Other users can receive the certificate digitally, and the certificate will be uploaded onto the chain as a new block. As such, this proposed system does not require an intermediary, and all transactions take place directly between buyers and sellers. Transactions are cryptographically secured on all legitimate servers of all parties involved and are associated with time stamps, enhancing transaction auditability.

MOTIVATION:

The world is changing at breakneck speed, and we don't realize it. Cryptocurrencies and blockchain technology are irreversible advances that will transform existing industries and the way financial communication is done. Distributed data management and information systems require large amounts of data storage. Various attack problems that can occur in clustered database architectures. There is no automatic recovery from attacks in the Core Data Architecture. A distributed architecture enables automatic data recovery in the event of various attacks.

SCOPE:

The scope of this project is to gain a deeper understanding of technologies such as blockchain, information retrieval, and smart contracts in order to create a concise summary of a given news article. This scope also includes understanding how blockchains and smart contracts work and how security algorithms such as SHA256 are used to ensure secure authentication.

LITERATURE SURVEY:

Fiscal institutions have also started espousing blockchain technology to avoid problems with network bushwhackers and security- grounded issues in online deals. A digital currency called Bitcoin ensures a decentralized and decentralized peer- to- peer payment scheme. similar networks have the fresh benefits of invariability, reduced third- party freights, and briskly deals. Electronic payment documentations are grounded on cryptographic attestations and don't involve third parties furnishing trusted payment platforms. The double- spending problem is also avoided by a distributed time- stamping garçon that chronologically generates attestations of sale computations. druggies can corroborate their individualities using digital autographs. Private keys are used by each stoner to make deals, and other bumps check druggies' public keys to corroborate the authenticity of payments. However, he has tore-execute the pow of all former blocks and all posterior blocks, stifling the work of honest bumps, If an bushwhacker wants to intermediate in a block of deals. This can not be done without network-wide agreement, making attacks on blockchain networks a tedious task(2).

Brokerage freights when buying and dealing real estate are huge. It's a waste of time and plutocrat. Blockchain-grounded smart contracts track events successfully and maintain an online tally. The Evarium system is a digital real estate investment model that improves cost savings and profit sharing in marketable real estate deals. Smart contracts are language- grounded contracts whose information is maintained primarily through service-acquainted pall computing capabilities. still, smart contract development in the current Evarum system is a major challenge as it requires a large number of interdependent smart contracts that shouldn't beget concurrency conflicts. Another issue is that of wide use

not addressed in current exploration (3).

In the healthcare field, each case's medical history must be treated with utmost confidentiality. Blockchain technology is being used as a decentralized approach to securing patient medical records. Security is enforced in three phases, including authentication, encryption, and data reclamation. It uses amount cryptography and Advanced Encryption Standard (AES) encryption to insure secure deals for end druggies. Data is recaptured using the SHA algorithm(1).

EDuCTX implements a blockchain- grounded approach to collecting and participating academic data from scholars across universities and assiduity. The credits earned by scholars are streamlined chronologically, and the rearmost education is streamlined with recently created blocks. Enrolled advanced education institutions act as bumps in the network and can award credits to each pupil upon successful completion of coursework

PoW is implemented on EDuCTX using the ARK blockchain platform. Language issues and administrative hurdles for international students to enroll in foreign universities are greatly reduced by available data pools that are securely stored and shared. The selection process can be completed with less effort if students allow their research data to be viewed by educational institutions or potential employers. [4].

Defining Smart Contracts for Land Registry on Blockchain [9]: This whitepaper highlights the challenges facing the current process of land registry in India, such as B. centralization, intermediary or broker involvement, time delays, instances of fraud, and human error or intervention. To solve these problems, they put forward the idea of using blockchain technology and emphasized the importance of smart contracts. The solution proposed in this document solves all of the above problems but does not validate buyers and sellers.

A Secure Land Registration Framework on Blockchain [11] - The system proposed in this article follows a hybrid blockchain decentralized approach with different consensus algorithms, without the involvement of a third party, and without the involvement of a new owner. and verify all land transactions with the previous owner. The system also supports various land transfer cases, such as land division, inheritance cases, wills, and mortgage cases, using decentralized blockchain technology. The system implements the use of Ethereum, which makes transaction processing times very short and efficient for real-time applications.   Blockchain challenges and

opportunities: Survey [13]: This paper briefly describes blockchain technology and its key elements, such as decentralization, persistence, immutability, anonymity, and audibility. This white paper introduces blockchain architecture and its taxonomy, describes and compares different consensus algorithms, and describes and eliminates technical challenges such as scalability, privacy leaks, and selfish mining. We mention recent advances, and I would also like to draw attention to the future possibilities of blockchain technology. Overview of Smart Contracts and Use Cases in Blockchain Technology [14] This white paper describes how smart contracts on the blockchain streamline complex processes with high security and low cost. Integrating blockchain technology with smart contracts can be robust. This white paper describes the various components and working principles of smart contracts. This paper essentially gives an overview of smart contracts in blockchain technology without a detailed study.

PROPOSED SYSTEM:

In recent times, a lot of problems are faced by marketable real estate diligence and land registration systems where Indeed, though the data is in digital form, it's stored on distant systems and there by warrant translucency, trust, and Effectiveness. The intention is to apply a small module. of the land enrollment process with respect to the state of Maharashtra. We propose a private and permissioned blockchain system. That restricts the actors who can contribute to the agreement process, to overcome the obstacles faced before as mentioned Our blockchain system makes use of asymmetric cryptography for the security of drug users and distributed consensus algorithms for tally thickness. The main features of blockchain technology are decentralization, continuity, obscurity and auditability, and a blend of these results reduced cost, improved effectiveness, and increased trustworthiness.

In our portal, we register land druggies by taking into account all their credentials and obligatory vindicated documents where the admin invokes the smart contracts "Put for Sale" and a change of ownership for the purpose of selling and buying the land. formerly all the necessary conditions are met Also, only the stoner is eligible to buy or sell the land. After Upon completion of the deals, one

can view all the sale history, including all its former possessors, the date of purchase agreements, and a summary of all land details. The lands are displayed area-wise or land id wise as per the user's convenience. Therefore, our system works efficiently and caters to the need for a modified and decentralized land administration system.

METHODOLOGY:

A system is divided into five stages, each of which has its own set of dependencies.
S = (Q,,, p0, F) where

• Q is a set of countries that has a finite number of possibilities.
• the elements are a finite set of symbols.
• is the transition character that occurs when $Q \times \rightarrow Q$
• P0 is the starting point for recycling any input (p0 Q).
• F is a set of final state/ lands of Q(F Q). completely (n) data bumps resolve return 1 when each has the same blockchain, Q = first transactional data with beginning block = SHA- 256, Consensus-Val, Mining

The work has been divided into 2 modules, where module 1 gives a detailed description of the working of the administrator with regards to the registry and invoking the smart contracts where Module 2 gives a detailed description of procedures related to change of ownership and completion of the purchase of land.
Register Users: The admin adds users to the platform by filling in a form with their details that include their name, mail, phone number, address entry, and the criminal history details of the user (if any).
Register Land: The admin also adds the land asset record by filling a form that contains the land identity number, the position of the land, the size of the land in acres, the7/12 contract details to corroborate the land, the corresponding contract number and eventually the identity number of the former proprietor and the current proprietor of the land.
Put a land for sale: When requested by the holder to put his land for the transaction, the admin invokes the Put For transaction deal that in turn brings the smart contract that contains the business sense for putting his land for the transaction.
Change the owner of land: when a buyer requests to buy

a land asset, there needs to be a change in the holder of the land. The land must have been put into the transaction by the seller. Also, The current holder is assigned to the prior holder's attribution, while the buyer is assigned to the new holder's attribution of the land asset.

ALGORITHM ANALYSIS:

SHA-256: The hash value calculated for each block will be unique as it's linked to the hash of the privy block.

POW: It makes the information related to each transaction more secure. It consists of 12 nodes, which are responsible for confirming transactions, mining a new block, and adding a new block to the blockchain.

Elliptic-Curve cryptography: This algorithm is used for signature generation, which is used for confirming whether the transaction is inked by the proprietor or not.

Merkle Tree: It's used for linking the transactions using hashes, which reduces disk operation.
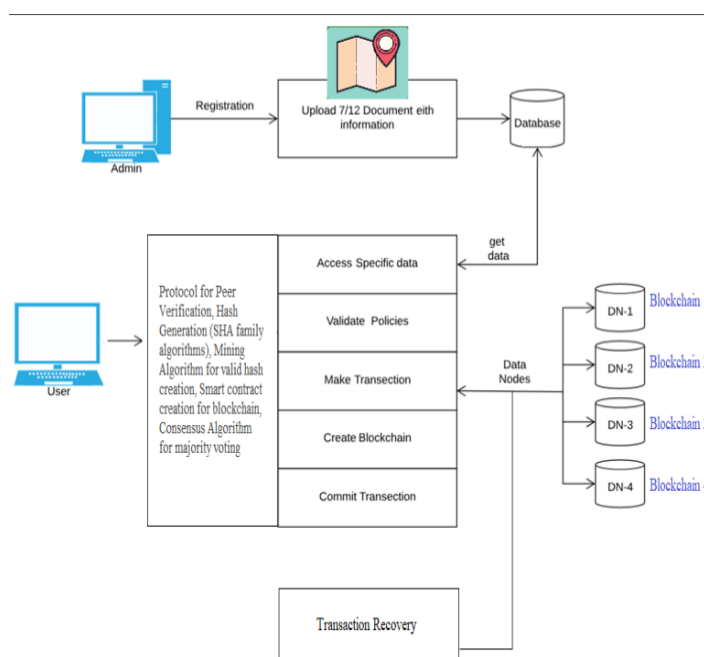
SYSTEM ARCHITECTURE:

Fig:1-System Architecture

CONCLUSION:

There are several research directions for implementing blockchain technology.to real estate transactions due to the breadth of this area and the need for more reliable and efficient information management systems. An interoperable infrastructure will certainly play a significant role in the usage of cases that face popular data sharing and communication issues for many real estate transactions. In terms of technology, further research is needed to decide the most realistic design approach for developing an interoperable system using Blockchain technology while maintaining the critical protection and confidentiality it concerns in real estate transactions. It aims to teach software engineers. and domain experts about the potential impact of this new technology, or to develop a decentralized application using an existing blockchain, more work on effective and reliable software experience for implementing blockchain Technology in real estate transactions is also required. Methods for validating and evaluating the efficacy of Blockchain-based healthcare architectures in comparison to existing frameworks are also essential (for example, see specific measurements of computation time and expense, or analysis methods relevant to their feasibility). In some cases, a new blockchain network might be more appropriate than current blockchains; as a result, another choice might be to look into enhancements to an existing blockchain or to build a Blockchain real estate transaction that offers services tailored to real estate transactions. With blockchain technology, the vulnerability and inequality that these land registrations cause can be prevented. The use of distributed ledger technology would help to build trust.

FUTURE SCOPE:

Currently, we are just focusing on securely registering the land registry and providing a platform to update buying and selling details in the system by not interfering with the current government system. In the future, our scope could be expanded by integrating our system with government APIs. By doing so, We can verify the users and their deeds automatically in a simple manner. Also, the incorporation of a language translation tool can be provided to users who speak their native languages. Lastly, we can also keep track of the entire history of a piece of land and add various dimensions to our system,

thus making it more reliable and user-friendly.

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