

DECENTRALISED REAL-ESTATE USING BLOCKCHAIN

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Abstract—

The advent of blockchain technology has been set to revolutionize the real estate industry, and the potential changes are already taking shape. The real estate industry is one of the top global sectors that is driving the economic growth of any country. Developing a secure central system that not only accelerates the process of land registration but also makes it efficient will be effective. This project presents a block chain-powered real estate management system that will provide a transparent, secure, and efficient system for real Signature estate management. The proposed project allows a real estate agent to register a new person. It also allows a real estate agent to register a property sale against a registered person. Block chain technology and smart contracts can sort out the classical issues that RE is facing, and they offer much more meaningful tools for a game-theoretic stable-priced market.

Keywords— blockchain, real estate, smart contract

INTRODUCTION

This research introduces blockchain technology and smart contracts in residential and commercial real estate. Currently, fraud and insecurity are threats to the real estate market. The main objective of this project is to set the groundwork for continued transparency in the real estate industry so that fraudulent activities cannot take place due to false agreements and to introduce transparency through the process. The goal is to develop tamper-proof systems and do rid of reliance on third parties for transactions. Real estate is going through a significant evolution and transformation toward smart cities on a global scale. Smart cities are being developed, and a large number of networks, services, and exchanges are being planned into the initial and ongoing design of the cities. Innovation has improved people's quality of life while also helping to simplify the process of trading real estate. But there is little doubt that security risks accompany technical progress. Therefore, as block chain and cryptocurrency technology advanced, the immutable, tamper-proof technology started to establish its roots in a broad

range of applications. Real estate transactions, which were previously unpredictable because of hidden clauses in lease agreements and other factors, can now be transparent thanks to block chain technology.

LITERATURE SURVEY

[1] Global real estate (RE) investments exceed the size of the stock market. Despite this, the number of RE investors is much lower due to liquidity and global access. The current system is barely satisfactory for tenants, owners, and investors. The goal of this paper is to test the use of blockchain in the real estate market and represent the benefits it can provide. So far, the research has led to the following conclusions: Blockchain technology and smart contracts can solve the traditional problems that RE is facing, and they provide far more useful tools for a game-theoretic stable-priced market.

[2] This research looks at two approaches to real estate transaction execution: the South African case and an international blockchain technology use case. Using Business Process Modelling and Notation, two conceptual models are presented. Document review was used to provide adequate information on the real estate transactions. According to the findings, the South African real estate transaction process is inefficient because it is manual, involves paper-based documents, and is heavily reliant on third parties, resulting in numerous bottlenecks. According to the study, blockchain-based transactions are more efficient and reduce the need for third parties and manual processes.

[3] When a person purchases land under this system, the government authority will provide the person with a hard copy of the property papers, and the system will store the documents in the Inter Planetary File System (IPFS), a decentralized database. The hash of the document will be generated by the IPFS network. After the smart contracts' conditions are met, this hash will be securely stored in the Ethereum blockchain. The documents from the government authorities will be validated and verified by the smart contracts. This will create a decentralized, tamper-proof ledger from which we will be able to easily retrieve the stored data.

[4] In this proposal, lands are registered on the Blockchain network using a smart contract. The proposed study can provide several benefits to stakeholders, such as efficiency, transparency, trustworthiness, and integrity for various entities and processes involved in buying and selling real estate. Essentially, the framework provides services that provide a detailed history and unaltered information about a property to ensure that the record is not tampered with. Restful provides an external link to traditional property dealing apps, allowing them to extract real-time records of the land, such as dimension, location, and price. The proposed system will ultimately ensure trust in conducting real estate transactions over the Internet.

[5] This paper describes a real estate management system powered by blockchain technology that will provide a transparent, secure, and efficient real estate management system. This system will include all real estate management departments. It will store all transactions on a distributed permission blockchain, which will be very secure and resistant to hacking, and it will be highly automated. The system will be centralized in terms of connecting all departments and decentralized in terms of data storage. It is a practical solution to the problem of real estate management.

[6] VO Khoa Tan created the Blockchain network architecture as well as the distributed ledger and smart contracts. As a result, this method is capable of digitizing assets on the Blockchain, storing decentralized transaction history, enabling encryption, and facilitating transactions between sellers and buyers. Furthermore, this system model can reduce data explosion, perform multiple transactions at the same time, and prevent data tampering and sensitive information disclosure. Based on the Ethereum Blockchain platform, the researchers created a prototype of this system model. As a result, they have demonstrated the efficacy of the RETT system model and its practical applicability through experimental transactions. In real estate transactions, this method improves transparency, eliminates intermediaries, saves money, and increases mutual trust.

[7] For more than a decade, the global real estate market has been rebuilding in response to new realities. Because of mass digitalization and instant access to the Internet, network users were able to obtain information about the object they required as

quickly as possible. To remain relevant and competitive, the market is attempting to implement all new technologies. Many of the third-party factors that make real estate and cadastre work impossible or difficult are eliminated by the use of blockchain technology.

[8] The proposed solution includes a decentralized ledger that runs on top of blockchain technology to record land and property transactions. Smart contracts will validate all new transaction entries to ensure the transactions' validity. The transaction records will be stored in cryptographically secured blocks after a proper consensus mechanism has been performed. As a result, the data integrity could not be compromised. Furthermore, before purchasing or investing in land, investors and land buyers can obtain information about current market trends and predictions. Furthermore, the proposed system allows users to view land information graphically and to view the desired land parcels without physically visiting the real location via the geographical information system.

[9] The main contributions of this work are based on the uniswap protocol, which allows users to exchange crypto coins. The automated liquidity protocol provision on the blockchain Ethereum platform is defined as the Uniswap protocol. A user can use the uniswap to buy or sell ERC20 tokens in the decentralized distributed network using an Ethereum smart contract. This paper will assist blockchain network users in using the uniswap protocol as a trustworthy and efficient way of exchanging crypto coins or tokens in the blockchain network.

[10] The deed or an agreement signed by the government that is physically present on a piece of paper and the records kept by the government in the ledger is proof that you own the property. You must hope that you do not lose the deed or that the government ledger is not damaged or misplaced. That is the type of assurance you have. The researchers propose a system that will assist us in solving this problem. If you want to buy or sell property, you can fill out the smart contract form and receive a digital deed that is uploaded as a new block in the chain. Each node's copy will be present on multiple servers, allowing us to maintain integrity in the event of an attack or system failure.

Table 1. Comparison Table of existing systems

S.NO.	TITLE	PROS	CONS
[1]	“Blockchain-Based Real Estate Market: One Method for Applying Blockchain Technology in Commercial Real Estate Market.”	Network reliability and longevity, faster transactions and lower transaction costs.	Accuracy is less.
[2]	“Business Process Models of Blockchain and South African Real Estate Transactions”	Using land with blockchain leads to more efficient transactions, reduce costs and third parties, and reduce transaction time	Slower than traditional systems
[3]	“Land Registry Using Blockchain - A Survey of existing systems and proposing a feasible solution”	Prevents data tampering within the network	Costlier compared to a traditional system
[4]	“A Transparent and Trusted Property Registration System on Permissioned Blockchain”	It is a transparent system trustworthy for public	It is hard to correct a mistake or make any necessary adjustments
[5]	"Real Estate Management System based on Blockchain."	Integrity, Security, and Immutable Data	Not completely automated
[6]	“The Real Estate Transaction Trace System Model Based on Ethereum Blockchain Platform”	Integrity, Security, and Immutable Data	Not completely automated
[7]	“Review of Existing Solutions in the Field of Real Estate and Cadastral Accounting Based on Blockchain Technology”	Users get proof of transaction	User Interface issues
[8]	“Decentralized Ledger for Land and Property Transactions in Sri Lanka Acresense”	Promising results and flexibility	Few complex real estate cases considered
[9]	“Blockchain based Application: Decentralized Financial Technologies for Exchanging Crypto Currency”	Eliminates mediator	Does not consider real world problems
[10]	"BlockChain to Prevent Fraudulent Activities: Buying and Selling Property Using BlockChain."	Users get proof of transaction	User Interface issues

EXISTING SYSTEM

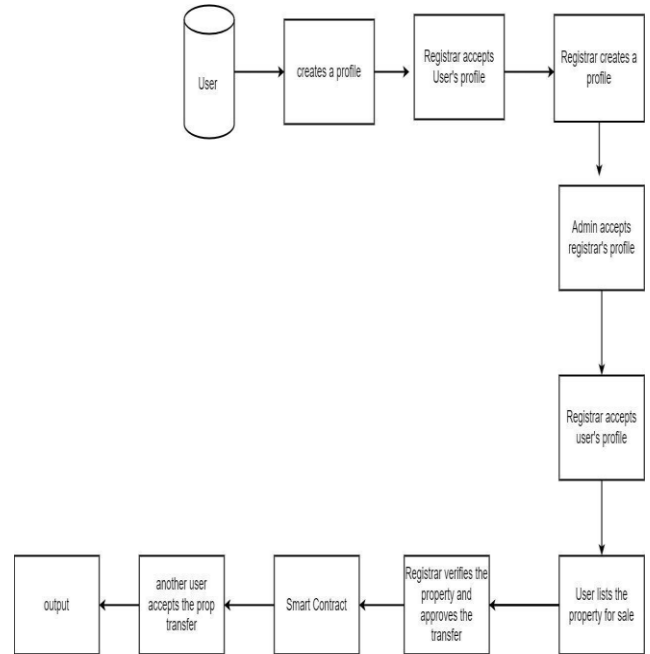
The existing system doesn't use blockchain and the existing system is mainly owned by agencies and brokers. Also there are many scams and frauds occurring in the existing system due to the security issues.

Real estate fraud/scams: In the current climate, whether you buy or sell a property, no matter who you are, someone will be duped in some way. As victims of such dishonesty within the corrupted structure, we are all inevitable victims. Block chain, however, provides the trust beam to upend the entire framework and make it more investor-friendly. Since the data is stored on a public blockchain, it is protected against theft and harm. The implementation of blockchain-based agreements will provide the industry with the long-awaited solutions.

PROPOSED SYSTEM

A novel solution in terms of speed and security has been provided by blockchain technologies integrated with the real estate industry, which may greatly reduce technological scams. This ground-breaking technology accelerates the time between signing the preliminary sales agreement in real estate and streamlines the data transmission process (i.e. smart contract). New digital architecture makes real estate transactions more automated. Members can access the parcels for trade under this method, but only after their information has been validated. The proposed system will place a strong emphasis on smart contracts, which are contracts that automatically execute and are directly put into lines of legislation with the terms of the agreement between sellers and purchasers. For a range of different edge situations relating to the transfer of land and property, a distinction-free method is applied. For each transaction, the system adheres to the Bitcoin Blockchain's stringent decentralized principles while using a medium for reality agreement. Only blockchain members will have access to the data stored on the system. In order to prevent the blockchain from coming into touch with unauthorized individuals in the limited areas, members outside the visual range will only be allowed to examine the packets for trade at the cost of being enrolled in the blockchain. The authorization system redefines the crucial idea of access control for a trustworthy data storehouse.

SYSTEM ARCHITECTURE



IMPLEMENTATION

Module 1: RealEstate.sol Contract

The RealEstate.sol contract is used to handle all the user storing & land registration logic.

Modifiers-

onlyAdmin(): It restricts function call to only Admin .The transaction will get reverted when if someone else tries to call the function.

onlyRegistrar(): It restricts the function call to only the Registrar.The transaction will get reverted if someone other than the registrar tries to call the function

Module 2: Creating Structs and Functions

Structs are custom data types.

ApprovedUser: This struct has id as unsigned integer,name of the user as string,district-code as unsigned integer,property count as unsigned integer,Acceptance status as Boolean.

Property: This struct has id as unsigned integer, Registrar's Name as string,Registrar's Address as address, District code as unsigned integer,Acceptance Status as boolean.

Functions

1. registerProperty(): This function is used to register property. At first it checks if the property is already registered or not. If the property is already registered then the transaction is reverted with a message saying that "Prop already registered".
2. approveProperty(): only Registrar modifier is used here. For that the calling access is restricted to only the Registrar. At first in the require statement, it checks that the Acceptance of the prop is False or True. If it is false then that means the property is not Approved.
3. initiateTransfer(): It takes property ID, part ID, New owner's ID as parameter. It first checks if the part ID exists or not. If it exists then the transaction is reverted with a message saying that "Transfer initiated ahead". It also checks if the acceptance status of the prop is true or not and if the user is verified or not.

Module-3: Front-end

The ABI & address of the deployed contract is used along with the help of web3.js library to connect the frontend with the smart-contract. The whole code for the front-end part is contained in App.js file.

- At first it is checked if Metamask wallet is exists in the user's browser or not.
- If Metamask does not exist in the user's wallet, then the
- User is prompted to install a Wallet
- Then the user is asked to connect to the wallet.
- After the user signs the transaction the landing page is shown, where the user can fill the form to register their property and save the data on the tamper-proof, immutable Blockchain.

CONCLUSION

Like every new technology, blockchain technology is being embraced by a wide range of industries. There are a few questions that need to be addressed before blockchain is implemented or introduced in any firm. It must be confirmed if numerous parties exchange and update data, if any verification is necessary, and

whether the current system is time-sensitive and entails complicated intermediates. Organizations can adopt blockchain technology after cost-benefit analysis is completed and these questions are resolved. Implementing blockchain technology for leasing, selling, and purchasing land would have greater benefits compared to any other sectors because real estate deals with complicated intermediaries, time-consuming due diligence processes, sensitive data sharing and verification, customer relations, sentiments, and its enormous share in a country's economy. To increase token investments and handle difficulties with security, trust, and speed, smart contracts are used in conjunction with tokenization. This opens up the possibility of involving regular people in large real estate developments that are often exclusive to a select set of corporations.

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