Blockchain Technology In Real Estate

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Abstract— **Blockchain technology and cryptocurrencies have helped to create a new crypto-economy in recent years. Commercial real estate, on the other hand, continues to be heavily reliant on a variety of disjointed networks that blur transactional transparency and create friction in existing systems. Here's where shrewd agreements, PC conventions that naturally work with, check, and implement dealings and arrangements between a few gatherings, become an integral factor. Smart contracts have made it possible to create decentralized apps of the next generation which are not dependent on an outside party that is trustworthy; however, legal issues, security concerns, and flaws impede the adoption of these applications. All exchanges that have happened in a shared organization are put away in the circulated data set known as the blockchain. The issue of centralized party trust is effectively addressed by this distributed computing model. Multiple nodes cooperating within the blockchain system to protect and manage a collection of distributing information about transactions in a decentralized way without capitalizing on any external entity. The Ethereum blockchain offers a number of advantages that the commercial real estate industry can effectively utilize. Some of these advantages include having transnational dissemination of assets accessibility, having access to larger investor bases as a result of ownership fractionalization, having access to opportunities in the secondary market, having accessibility to statistics to promote clarity and assist improved decision-making regarding investments and the administration of portfolios, having optimized processes for underpinning business processes, and having fewer expenses as a consequence of the automation of processes. One of the most intriguing applications of Ethereum is the automated monetization for property, which is additionally referred to as tokenization. Through the method of tokenization process, real-world possessions such as as real estate, real estate funds, income streams, management rights, and other objects can be encoded by digital currencies. At the point when these resources are tokenized, they might be separated into more modest pieces, made accessible to extra financial backers, and utilized as influence to fund-raise. When these assets are tokenized, they can be broken up into smaller pieces, made available to more investors, and used as leverage to raise money. Although smart contracts and blockchain technology have obvious advantages for commercial real estate, there are still legal issues, security risks, and flaws that need to be addressed. The commercial real estate industry may benefit from the Ethereum blockchain's ability to access worldwide asset distribution, access to larger investor pools, and lower costs due to process automation.**

Keywords— blockchain, real estate, Hardhat, MetaMask, solidity, Ethereum.

I. INTRODUCTION

Traditional systems rely on a central authority, like a bank, to assure the security and dependability of transactions between parties. This method, however, frequently yields significant transaction costs and a single point of failure. By facilitating distributed interactions between untrusted parties without the requirement for a trusted intermediary, blockchain technology provides an alternate approach. Blockchain was initially developed as a Bitcoin-based peer-to-peer digital payment system. It is a distributed database that tracks all transactions across the network. However, it has evolved into a device that can be utilized to create a wide range of decentralized applications, including smart contracts. Smart contracts, which are executable scripts that run on the blockchain, can be used to facilitate, carry out, and enforce the rules of an untrusted agreement. Digital assets can be distributed to all or some of the parties involved when specific criteria are met. Because they do not rely on a trustworthy third party, smart contracts have lower transaction costs than conventional contracts. Because of its Turing fulfillment highlight, which empowers the development of additional perplexing and redid contracts, Ethereum is the most well-known blockchain stage for creating brilliant agreements.

Smart contracts have a wide range of uses, including smart homes, e-commerce, and music rights administration. This study's main goal is to discover prior research on blockchain-based smart contracts as well as current problems that require further investigation. The methodology the researchers used for their review was a methodical mapping approach, which comprised building a map of the most recent research on smart contracts and finding pertinent publications in academic databases. The examination focused exclusively on the technical components of smart contract studies, which can assist uncover research needs.

An indestructible digital ledger, which is a distributed framework in which all records are stored at each node in the decentralized network, is where every transaction in a blockchain is recorded. Through Smart Contracts, Ethereum lets applications run on the blockchain. This makes it easy for creative project ideas to raise money through crowdfunding. Additionally, the study provides this application with a user-friendly interface, making it simple for everyone to share their thoughts and for others to contribute to the discussion.

Decentralization, durability, secrecy, and audibility are just a few benefits that blockchain technology offers. elements and transactions make up the two basic building elements of the

blockchain system. Blocks are a collection of data that record a transaction together with other pertinent parameters like the correct order and creation timestamp, among other things, whereas transactions are the activity started by a member. The transaction records, or blocks, on the blockchain are immutable because they are cryptographically linked together, making it impossible to change or remove any one of the embedded blocks.

There aren't many studies and research articles accessible about blockchain technology because it's still quite new. However, there is a lot of potential for smart contracts to transform conventional contracting procedures and open the door to new uses. Researchers can unleash the full potential of blockchain-based smart contracts and open the door to a decentralized future by identifying research gaps and addressing present problems.

II. LITERATURE REVIEW

The real estate industry is responsible for more than 200 trillion dollars, 60% of the wealth in the world, and more than 40% of the energy-related carbon dioxide emissions. Despite its significance to society, the environment, and the global economy, the real estate industry's digital maturity is frequently rated lower than that of many other industries. Digitization has the potential to significantly boost productivity. Blockchain, a decentralized system for managing transactions and data, has the potential to help the real estate industry address some of its most pressing issues, such as inefficiencies, corruption, fraud, high costs, and issues with trust. Although they have frequently focused on a specific field, such as land administration, numerous studies have investigated the possibilities, advantages, and disadvantages of blockchain in the real estate industry. By combining theoretical perspectives on the real estate industry with the empirical findings of actual blockchain implementations, the current article aims to fill this research gap.

The study addresses the following issues: How have the benefits and drawbacks of blockchain implementation in the real estate sector been seen over time? What real-world blockchain application examples are there in the real estate sector? How do the theoretical viewpoints and the practical findings compare in the real estate sector?

Nick Szabo, a cryptographer and legal expert, first thought of a secure and decentralized property title system in 1998. After 10 years, the blockchain thought was introduced under the pen name "Nakamoto," which fixed the twofold enjoying issue with Szabo's property title framework. A number of blockchain-based real estate market proposals have been made since then. It would appear that blockchain could theoretically solve some of the major issues facing the real estate market.

According to different points of view, methodical writing surveys notice the land business, especially land organization, as one expected application for blockchain. E-government and smart cities are two more potential applications. However, there are currently no systematic reviews that provide a current and comprehensive understanding of the blockchain's potential for the real estate industry as a whole, not just land administration. As blockchain technology develops at such a rapid rate that earlier works soon become out of date, research is being published more frequently.

In addition, the majority of research on real estate blockchain has concentrated on theoretical ideas rather than realistic settings. The goal of the current study is to close this research gap and strengthen the theoretical discussion by fusing the conceptual viewpoints on the real estate industry with the actual findings of practical blockchain implementations.

Adopting blockchain technology might benefit the real estate sector in a number of ways, including by lowering costs, boosting confidence, increasing efficiency and transparency, and reducing fraud. By offering transparent, unchangeable, and secure platforms, blockchain may potentially enable new, creative consumer and commercial solutions.

Land registry, title transfer, property administration, and smart contracts are a few specific examples of blockchain applications in the real estate sector. For instance, the government of Georgia has established a land registration system based on blockchain that enables property owners to maintain and transfer titles without the need for middlemen. To cut down on the time, money, and complexity of property transfers, Sweden has devised a blockchain-based system.

The implementation of blockchain in the real estate sector may also have certain disadvantages, such as regulatory and legal ambiguity, technical difficulties, interoperability problems, and the requirement for substantial investments in infrastructure and training. A further obstacle to wider adoption is the existing lack of standardization and compatibility across various blockchain systems.

The empirical findings imply that while blockchain has the ability to solve some of the biggest issues the real estate market is now facing, it is not a cure-all. Technical problems, regulatory restrictions, and the requirement for substantial investments in infrastructure and training are just a few of the constraints and hurdles that real-world blockchain implementations in the real estate business have run against. The use of blockchain in the real estate sector also necessitates cooperation amongst many parties, including governments, regulators, real estate experts, and technology suppliers.

III. METHODOLOGY

The project is a web application, which is basically a better version of the existing online real estate platforms. The majority of people view blockchain as a democratic technology that gives users the flexibility to collaborate and conduct business as they see appropriate because it is based on decentralized networks. Using blockchain as a tool for purchasing and selling properties may commonly enhance the potential client traffic by using tax deductions as an incentive. As a result, patrons are encouraged to donate with fewer constraints and the giving process is transparent. Blockchain

real estate can be seen as a method to lessen the need for large-scale facilitators and centralized gatekeepers while allowing more cash to be exchanged in an unusual fashion. A smart contract is a contract that automatically executes between parties like as buyers and sellers, platforms and users, or other parties, depending on which procedure has to be automated and incorporated into the blockchain ecosystem. Instead of being transferred to the seller immediately, the money will be kept in the smart contract itself. If the owner of the property wants to sell it, they must establish a listing price. The approvers should then approve the request made by the property lister. (people who have approved to the property).

The listing system is decentralized since it uses blockchain technology in its execution. This ensures the listing's confidentiality while enhancing the security and effectiveness of the lister system. The advertised property will be offered for sale as soon as the inspector approves it. During the process, security is improved and user feedback is also gathered. The issue with the existing system is that businesses impose high costs on both the customer and the recipient. There is no evidence of the money, integrity, or communications between the investor and the client over the course of the project. Among the organisations that are already up and running, trust is the main issue with buying and selling. Not all of these businesses provide buyer guarantee programs.

Digital IDs based on the blockchain will work well in consumer applications, various industries, and the public sector. Background checks can be expedited, costs can be reduced, and security can be increased by using mutualized blockchain-based KYC/AML processes to identify investors and renters. Anyone can show that they own property thanks to decentralized identities, and it is simple to share important documents like identity proof, insurance information, and credit history with the right people. Thanks to technology known as distributed ledgers, leases can now be signed and paid for on the chain. Rent and dividend payments to property owners are now made automatically, eliminating the need for manual reconciliations. In order to reward tenants, landlords, and service providers for good behavior, smart contracts can automate additional payments and fees.

On-chain recording of property ownership and financial transactions makes it simple for investors and asset owners to conduct automated and nearly instantaneous accounting. When annual financial statements like the income statement, cash flow statement, and balance sheet are being prepared, real-time audits might be carried out. Improved investor engagement, regulatory oversight, and compliance are all possible as a result of this.
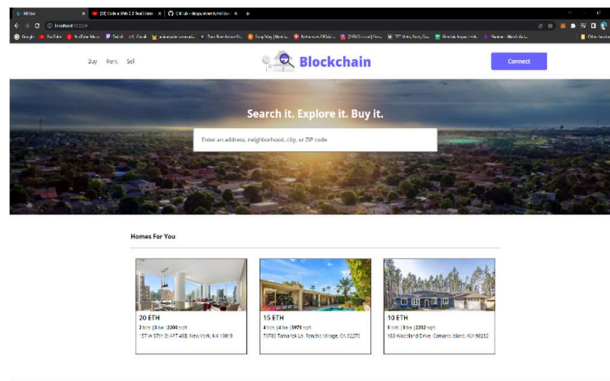
The buyer and the seller will meet one another online at a marketplace where the property is advertised and details about it are accessible to everyone. These facts may include information about the owner, the location, the custody chain, the region, and other relevant information. The market is rigged with integrated technologies to verify the users' identities and ensure their legitimacy.
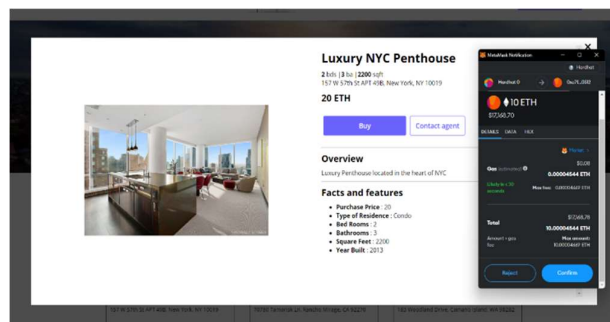
A method that uses blockchain technology to verify users' identities will be used to identify users. These verification methods are absolutely safe and don't require the involvement of a central authority because transactions will be carried out utilizing decentralized money and crypto currency.

Once both parties agree to proceed, all information relating to the agreement will be preserved in the form of a smart contract. Payouts will be credited to the seller in accordance with the conditions and parameters laid forth in the smart contract, and the buyer will get an acknowledgment of ownership. The blockchain will be used to store every piece of data so that it can subsequently be analyzed.
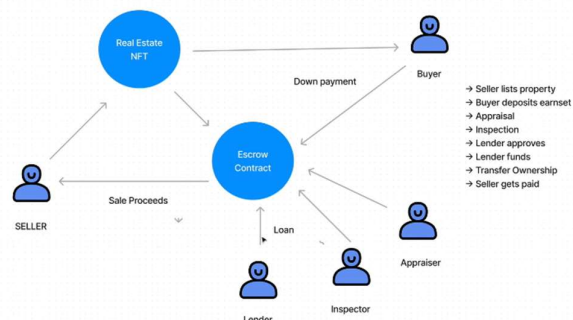
IV. RESULT AND DISCUSSION:

When blockchain technology is applied to the real estate industry, it offers a quick and safe new option that might reduce technological fraud. The period between signing the preliminary sales agreement and closing on a home is shorter thanks to this new technology, which also makes it easier to communicate data. (i.e. smart contract). Automating real estate transactions is now possible thanks to new digital architecture. After their information has been validated, members may only join the Blockchain and view the packages available for trade. In the proposed system, smart contracts, which are agreements between sellers and buyers written directly into laws, would receive a lot of attention. There are several edge circumstances that are handled utilizing a "difference-free" manner when it comes to the transfer of land and property. With a method of reality consensus for each sale, the system strictly adheres to the decentralised components of the Bitcoin Blockchain. The data stored on the system will only be accessible to people who are a part of the blockchain. Only members who join the blockchain will be able to view the packets available for trade if they are within the visible range. This ensures that individuals who shouldn't be there don't have access to the blockchain. The authorization system reconsiders what access control is all about in order to provide a secure location to store data.

V. CONCLUSION

The system based on blockchain technology confirms the fact that it is suitable for interacting with any instance of ownership and land transfer at the value of the organizations who are part of every transaction within the ecosystem due to its capacity to drive transparency and accountability, ability, and economic viability throughout the significant real estate industry through removing the existing shortcomings in the system as a whole. This is because there is a good chance that it will make the industry more responsible, competent, and profitable. The conventional methods of transferring property ownership are extremely labor-intensive and often involve significant financial and emotional resources. A flawed system may potentially yield several cases of fraudulent and identical paperwork for the identical piece of ownership. To overcome such challenges, the concept of blockchain technology was recently encompassed into the proposed approach. Along with blockchain technology, the involvement of cryptocurrencies makes it much safer than it may be in the future.

VI. ACKNOWLEDGMENT

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