

Implications of Block Chain in Real Estate Industry

Deepashree K. Mehendale , Reshma S. Masurekar, Harsha V. Patil

Abstract: In today's world of technology, we see that even the technology is running faster we are still far behind in the aspect of real estate industry. The standard procedure for the sale/purchase of a real estate includes several logical steps: housing assessment, collection of documents, conclusion of the preliminary contract, conclusion of the main contract, transfer of money, and registration, thus making the overall process lengthier, time consuming, complex involving many intermediaries and more cost. The use of online websites have made this time consuming process a bit faster, but the problem is about the security and issues regarding multiple resale of real estate. In this paper we focus on blockchain technology. Blockchain is a digital record of transaction in which the individual records are called as blocks, these blocks are linked using cryptography. Each block contains transaction data, timestamp and hash of previous block which makes it more secure and tamper proof. The three main properties of Blockchain are decentralization, transparency and immutability making it more robust. Blockchain technology has various number of applications which can transform society such as Asset Management, Insurance, Health Industry, Blockchain Government, Blockchain Identity, Passports etc. The research focuses on how blockchain technology can bring a diversified change in real estate industry. As of today the process is more time consuming, paper driven and most of the steps work offline. The research explores more about what the technology means, its benefits in real estate industry and its working model. **IndexTerms:** block, blockchain, cryptography, intermediaries, real estate

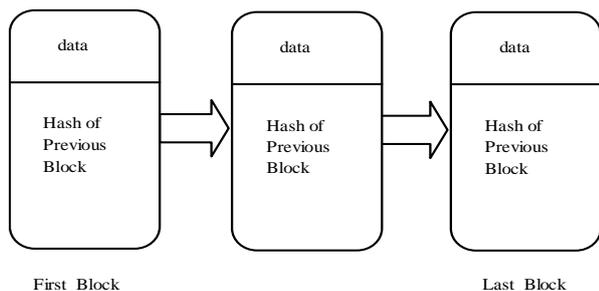


Fig : Blockchain

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I. INTRODUCTION

What is Blockchain?

The Blockchain is an encrypted, distributed chain of block that records transaction data with some characteristics. One of the vital factor of Blockchain is that data is accessible over several nodes and is not bound to be kept in a single location. The increasing list of blocks is connected using cryptography thus being secure and tamper proof. Each block contains transaction data, timestamp and hash of previous block [1], [8]. The structure of blockchain can be compared with a train where every coach is connected to its previous coach and next coach except first and last coach.

The core components of Blockchain architecture are [3]:

1. **Node:** - It is a user or computer within the blockchain architecture.
2. **Transaction:** - It is a record that serve purpose of blockchain.
3. **Block:** - It is a data structure used for storing a set of transaction which is distributed to all the network.
4. **Chain:** - It is a sequence of blocks in chronological order.
5. **Miner:** - It is a specific node which performs the block verification process.
6. **Consensus:** - It has set of rules which decides how the blockchain will function.

Blockchain in Business:

As focused in Blockchain for Dummies 2nd IBM limited Edition by Manav Gupta[5] the four key concepts of blockchain for business are as follows :

1. **Shared ledger:** - It is a distributed ledger used in double entry book keeping process to record the transaction which are shared among all participants in the network through replication. Each participant has its own copy of ledger.
2. **Permission:** - Blockchain are of two types permissioned and permission less. In permissioned blockchain every participant has a digital unique identity to access transaction details. These are more effective as they are able to control consistency by allowing one or more participants to modify data. For eg.: In a business there might be different permissions set for seller and buyer. But in permissionless every participant can interact with the network and add entries to the digital ledger.
3. **Consensus:** - Transactions can be verified through consensus (agreement). Consensus mechanisms vary from blockchain to blockchain, it includes Proof of stake and Multi-signature for validating transaction and to keep a check on valid transactions on the network.

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4. Smart contracts: - A smart contract is an agreement or set of rules that govern a business transaction; it's stored on the blockchain and is executed automatically as part of a transaction.

Benefits of Blockchain are:

- 1. Low cost:** - As blockchain restricts the use of intermediary therefore cost involved in process is low.
- 2. Transparency:** - All the parties who have agreed to participate in blockchain are able to view and update the block making the process transparent.
- 3. Security:** - Open blockchains are managed by a large network of entities that prevents any one entity from submitting inaccurate data, recording a fraudulent transaction. As every transaction is encrypted and connected to previous transaction there is less chance of hacking.
- 4. Increased speed:** - As blockchain automate the process using a single digital ledger which is shared among entities thus increasing the speed.
- 5. Increased efficiency:** - All entities involved in transaction share the same digital ledger thus making it easy to develop trust on each other without including intermediaries.

II. SMART CONTRACT

Smart contract is legal consensus which is made between different entities involved in the transaction. Likewise a paper agreement the smart contract contains all the rules and regulations for creating valid transaction. But a paper agreement has the involvement of third party to build trust during transaction. In contrast the smart contract is a program which gets initiated like a trigger when given conditions are satisfied. This approach potentially eliminates the requirement for trusted third-party. Thus reducing the cost for using third party. There are many industries which can be benefited by smart contract like shipping industry, legal industry, finance/banking and real estate. In this research paper we focus on use of smart contracts in real estate.

Following are the advantages of using Blockchain in Real Estate industry:-

According to reference How Blockchain Technology could disrupt Real Estate [7] various benefits of blockchain in real estate industry are discussed. It also focuses on areas of real estate which can be transformed by the technology.

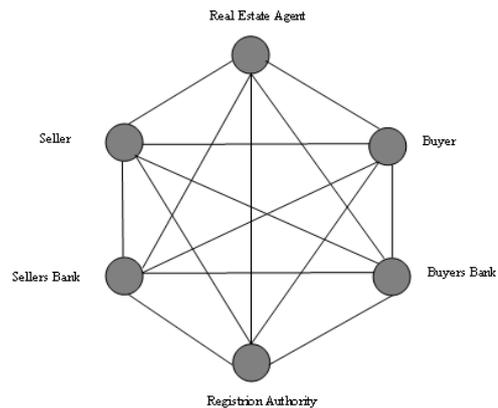
- 1. Stimulate the process:** - In real estate after the seller and buyer have reached a final decision, the seller needs to transfer his property to the buyer for which he needs to make an agreement get it notarized and send it to the government database. This process is time consuming and involves third party agencies. As contrast using Blockchain technology the document is converted to a digital copy which is cheaper, smarter and faster process. By using smart contract the authenticity can be verified without a middleman.
- 2. Reducing scam:** - Real estate industry faces a lot of frauds such as mortgage fraud, foreclosure fraud, title fraud, value fraud. The criminals involved in such type of fraud may be somehow able to create false documents. Blockchain solves the problem by replacing the paper work with digital proof. Using Blockchain technology we can upload title documentation to the chain of network, which other users

record and verify. This helps to provide the proof of the owner of the documents, and helps to prevent scam.

- 3. Transparency by using smart Contracts:** - The blockchain technology makes it practically impossible to modify or reverse any information once it is made on blockchain. As referred in the research paper [4] The Impact of Blockchain Technology on Real Estate using Smart Contracts the applicability of blockchain technology will make the process more transparent in nature for use. The rules and regulations of smart contracts are transparent to everyone thus reducing the chances of future litigation. The whole process is transparent. No transactions in the overall process can be deleted or replaced.

- 4. Multiple Listing Services (MLS):** - The MLS service in the current real estate industry gives entire particulars about the property details. But as the information is fragmented the process becomes inefficient. As contrast MLS in blockchain allows data to be distributed across peer to peer network giving more control and trust over the data. This results in low cost and access to more accurate and authenticated data.

III. WORKING MODEL OF BLOCKCHAIN IN REAL ESTATE



According to Victoria Melnychuk the standard procedure of buying house involving many logical steps which can be changed using blockchain. Blockchain can provides a solution to the lengthy process by bringing all the participants together [2]. The buyer interested to buy the property will search through blockchain enabled MLS Multiple Listing services. By using this service the buyer will get up-to-date information about the property which are created by the agent through the information given to him by the seller. After inspecting the property the seller and buyer reach at a particular negotiation. This process then moves to due diligence from both sides. The digital identity that is hash of the property is permanently stored in global ledger from which it can be verified by the parties such as financial institutions. As Blockchain links all the parties in the system, the buyer is directly connected to lending institutions with full transparency and real time view of transaction history, so that the lending decision can be made easy. This could be done by means of consensus which will run an algorithm to check the credentials of the buyer.

Managing the lending workflow in the current process is time consuming but it can be easily handled in this process.[6] This digital identity contains the information about the property. Once all verifications are performed in the network, the agreement would be formalized as a smart contract on blockchain. Money will be transferred from buyers to seller.

- Step 1:- The buyer and seller needs to register.
- Step 2:- The seller then appoints a Real Estate agent.
- Step 3:- The buyer invites the bank.
- Step 4:- Digitally signing the contract.
- Step 5:- The buyer instructs its bank to make the payment to the seller. Both parties are notified once the payment is completed.
- Step 6:- Property title is transferred, upon payment, The registrar digitally transfers the title from the seller to the buyer. Title transfer is updated on the app and visible to all parties.

Table : Comparative features

The above table gives an overview of comparison of features between the current process and the new process using block chain technology in real estate

IV. FUTURE SCOPE

The Blockchain technology is entering in every walks of life whether it is Manufacturing, Banking, and Healthcare etc. Real estate industry is not far away from this transformational change. As referred by Mr. Antao AV , Chief Operating Officer, Synergy Property Development Services[9] 56% of

Feature	Current Process	New Process
Model	The whole process goes through some or the other intermediary either an agent, lawyer who regulate the process	Makes use of Decentralized database. This database ensures around the clock availability.
Payment	Payment require third party financial services. Charges imposed by third party are more.	Direct payment by crypto currency. It charges comparatively less.
Processing Time	Lengthy process may require more time	The processing time is less as it is fast.
Transparency	Not much transparent	The whole process is transparent.
Security	The information can be hacked, stolen and even modified	Data is immutable so cannot be modified. More secured as compared to current process
Agreement	Paper agreement, where terms of agreement may change as it is regulated by third party.	Digitally signed smart contract
Language	Written in legal language	Written in computer language i.e.- Solidity

Indian businesses are inclined to make Blockchain a part of their core business. If implemented in real estate area, Blockchain will allow reliable property search, efficient management of property and cash flows. In the last 10- 15 years we have seen a drastic change in property search by customers by using online real estate websites. The adoption of Blockchain will truly have a positive impact in real estate market. Merging Blockchain with Artificial Intelligence will also have a great impact to enhance the process. This combination will work as decentralized intelligence system. Thus the blending of these two technologies will allow faster, smoother data management and verification and identification of legitimate transaction. This same concepts can be also applied for renting/ leasing a property in real estate.

V. CONCLUSION

Blockchain is the technology of future. The intervention of government body is necessary for achieving big success in this technology. It will do cost cutting not involve more intermediaries during the whole process. The whole process will become more transparent and trustworthy and tamper proof. The charges levied on all kind of process will be minimized due to usage of blockchain. A lot of paper work will be reduced. This technology also has a high level of protection. It is efficient, cost effective, reliable and secure system. Transaction volumes worldwide are growing exponentially and will surely magnify the complexities, vulnerabilities, inefficiencies, and costs of current transaction systems. It just requires the proper information about the property, its owner, and the buyer as well. And also the digital signature of the concerned persons. The smart contract will check if the information is genuine. It will review the information using the identity tracking protocols. It will help to improvise the following sectors of real estate industry.

- It establishes direct link from business to service and vice versa without intermediaries therefore saving cost.
- It provides real time transactional data.
- It simplifies the complex process by allowing access to shared ledger.
- It increases trust and authentication among seller and buyer.
- It gives greater visibility of transaction status over time.
- It improves transparency and efficiency among all participants in process.
- It reduces fraud and eliminates centralized data.
- It secures sharing of permissioned data.
- It provides immutability of digital documents.
- It reduces cost due to lesser use of intermediaries.
- It can be used to improve the performance if merged with Artificial Intelligence.
- It can also connect lenders and borrowers in more easy way. To encourage the implementation of this technology we should all be ready to accept the change and learn how to use this flourishing technology.



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