# Security of Blockchain Based Transactions in Real Estate Transactions

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## Abstract

It examined and summarized the applications of using blockchain technology in Russia and other countries as a highly efficient and effective financial and economic mechanism for participants in real estate transactions and found the main ways and options for its further development and improvement. He also found the main ways and options for its further development and improvement. General scientific research methodologies were applied by the authors, including analytical methods of economic and static analysis, complex economic and logical analysis methods, systems approach, and generalization comparison. As the need to invest money in realtors, lawyers and companies is reduced, fees and payments to agents are less likely to make mistakes by others. Their findings showed that the rationale for using blockchain in real estate is due to the advantages of the technology itself, namely high transaction speed, low costs and security. In addition, their findings showed that the rationale for the use of blockchain in real estate stems from the advantages of the technology, explored the security issues of blockchain-based transactions in 5G mobile networks, and a tool for policy setting and validation of financial transactions Based on smart contracts in next-generation mobile networks to protect customer data from potential compromise and threats. proposed method. He also explored security issues of blockchain-based transactions in next-generation mobile networks. The authors created an official

model called FPM-RBAC using smart contracts in 5G networks and performed a policy analysis for smart contracts based on security policy guidelines. Their findings highlighted the need for further research on the uses of blockchain technology and smart contracts in 5G networks to manage financial transactions, including cryptocurrencies, mobile digital payments, blockchain applications, and blockchain-based applications.

*Keywords: Real Estate Transactions, Blockchain in Real Estate Transactions, Blockchain Based Transactions, Security of Blockchain Based Transactions, Security of Blockchain Based Transactions in Real Estate Transactions*

## 1. Introduction

The real estate industry is an area ready to take advantage of blockchain technology and is one of the areas highlighted in this article. In their system, the authors took advantage of a layered architectural approach with four layers: Their findings showed that the immutability of the blockchain ledger and transactions can provide a secure environment for the real estate industry, while personal digital keys can be distributed to parties involved in a contract, thereby reducing the risk of fraud and digital payment. The Internet of Things and Blockchain Based Smart Contracts discussed how smart contracts and blockchain technologies create a practical solution potential, presented smart contract-based solutions that improve security and information management, and found new opportunities and challenges.

Users can interact with the public fields and methods of this class by sending transactions to their "address" on the blockchain. This model for smart contracts was developed by the authors and is based on blockchain technology. It is a programming language class with fields and methods. The findings of the study showed that developers should be able to integrate the internet of things (IoT) into their systems and processes . They must also be able to supply innovative, sustainable services. The app is a platform for sharing (selling and buying) measurements from IoT weather sensors and runs on the Ethereum blockchain, a marketplace for IoT sensor data. Their findings showed that blockchain technology allows users to conduct peer-to-peer (P2P) transactions on the

Ethereum blockchain using cryptocurrencies and explore methods to perfect the value of data collected by Internet of Things (IoT) sensors . The purpose of this research is to shed light on the challenges, risks, and opportunities of using blockchain technology in environments where intensive data collection takes place.

## 1. Smart Contracts

Smart contracts can be flexibly designed and implemented to achieve different data management policy, a condition critical for complex inter-enterprise environments in the public sector. This situation was analyzed by the authors, and it was found that IoT data management currently faces a number of risks and challenges, including privacy issues and data security issues . Their findings showed that especially Internet of Things (IoT) data enables smart city vision . This is because IoT data makes it possible to collect, store, integrate , analyze and mine large volumes of data. In addition, IoT data makes it possible to protect and manage data generated by sensors, cameras and other devices, which produces a variety of smart applications.

These studies were published in the following major databases by early 2020: IEEE, Springer, ScienceDirect and ACM Digital Library. Their findings revealed that the most common security services driven by smart contracts include non-repudiation, access control, authentication and integrity assurance; data protection; secure key management; and data protection. According to the findings of this study, Ethereum was found to be the most popular Blockchain platform for developing smart contract-based security solutions, followed by Hyperledger Fabric.

## 2. Proof of Ownership on the Blockchain

As a technological concept, tokens on the blockchain are the closest solution to the concept of legal title as they supply proof of ownership. Therefore, blockchain technology is the closest solution to the concept of legal title. The authors came up with the idea of a high-level architecture for the technology that can manage property rights on the blockchain and includes three different levels of mechanisms.

(1) *Smart contract templates based on smart laws and giving people the ability to manage their property rights online. These templates can be found online.*

(2) *The use of electronic voting, which ensures the democratic management of management algorithms.*

(3) *Smart Laws, high-level "intelligent" algorithms designed as legal frameworks.*

Their findings showed that there are several legal concepts that need to be resolved, such as inheritance procedures , litigation, guardianship, transfer of rights and rights of third parties (volumes and mortgages) as well as several issues to be resolved.

Their findings suggested that the use of blockchain technology in conjunction with smart contracts could streamline processes, enable transactions to take place within the European Union, and ease communication between different public administrations. However, to protect the rights of the parties involved, the blockchain in question must have several unique features such as changeability. Proof of delivery (PoD) of digital assets is discussed in detail detailing a system and framework based on blockchain technology. The findings showed that the blockchain-based solution uses the core features of the blockchain and Ethereum smart contracts to supply immutable and traceable Ethereum smart contracts. In addition, the solution covers basic security requirements and proves how it is safe against common attacks such as Man in the Middle (MITM) and replay attacks.

Additionally, they stored documents in a distributed file system such as IPFS (Interplanetary File System) and offered a user interface rather than a command line application for doing these operations. Their findings showed that the Ethereum platform, on which land transaction takes place between sellers and buyers, ensures data immutability, and as a result, transaction records can be used to trace the history of land. The authors emphasized that the widespread spread of fake digital content in recent years has the potential to be a frightening and dangerous phenomenon , potentially changing reality and undermining trust by creating false realities. Examples of such content are fake images, images, sounds, and videos. Their findings showed that the proposed blockchain-based approach along with a generalized framework guarantees the validity of digital assets such as movies, audio files and photographs.

Discussions were held with several different parties to find the key aspects involved in the technique. As a result, the information from the talks is used to build a blockchain solution and confirm the proposed model. Their findings showed that the blockchain solution is superior to the traditional method of property registration as it simplifies the process of buying and selling office buildings in the Netherlands and clarifies the nature of certain assets by combining both the physical and contractual information needed for each transaction . The use of blockchain mechanisms ensures the accuracy of data and hints at the potential of blockchain technology to lead to improvements in transaction efficiency, transparency and trust. These enhancements can be achieved through cryptography, consensus mechanism, and validation rules. This made the process safe and efficient, and tokens were first issued through a security token offering using smart contracts. This platform will enable asset holders to connect with investors. By using a third-party service provider, Know Your Customer (KYC) and Anti-Money Laundering (AML) verification will be performed for each user who registers on the site. Their findings showed that the seller was able to directly publish information about the sale of real estate. Information about the property is obtained from the system database of the registry department , which ensures the accuracy and comprehensiveness of the information displayed by the buyer on the platform . Due to the decentralized nature of the blockchain, buyers and sellers can trade directly, and the transaction is both traceable and irreversible. Even after the Fair Housing Act of 1968 made it illegal to discriminate against homebuyers based on race or national origin, lending practices de facto prohibited Black people from buying homes outside certain communities. This continued long after the law was passed. This legacy has resulted in large numbers of Black people looking to buy homes being denied access to traditional forms of financial aid. Land contracts are used to fill the gap; however, the way they do this is essentially uncontrolled. The birth of the instrument can be traced back to the mid-nineteenth century, when laissez-faire economics was the norm and courts supported the idea that free-willed people could take care of themselves. Therefore, government control was limited and the responsibility to protect their own interests was placed entirely on the shoulders of consumers (receiver of warning). However, if buyers do not have other options for financing, they do not have the power to negotiate better terms for themselves.

Today, land contracts are within the authority of the Consumer Financial Protection Bureau; however, the organization of the bureau is still extremely limited. Although the crisis in subprime loans has led to increased federal regulation of mortgages, regulation of land contracts has not been tightened and is only partially enforced. Regulation of these units is often the responsibility of individual towns and states, leading to a regulatory patchwork that is inconsistent, inadequate, and supplies little assurance for consumers.

### 3. Anecdotal Evidence

There is no concrete evidence that most land contracts do not ultimately result in a home purchase by the prospective buyer; however, there is ample anecdotal evidence to suggest that this is the case. Most land contracts have confiscation clauses that allow the contract to be ended at once if even a single payment is missing, or any other condition of the contract is breached. In such a scenario, the buyer loses ownership of the property, and the seller keeps all the money the buyer spent on the purchase of the property, including the down payment, monthly payments, taxes, and insurance. Just like any home renovation. After that, the seller is free to sell the property to anyone interested in buying it.

Data on the prevalence of land contracts are inconsistent as only a small percentage of land contracts are legally registered. But estimates from industry professionals show that four million households have a total of two hundred billion dollars in land contracts. This represents about five percent of the non-rent market for single-family homes.

Loss of income, credit losses, decline in mortgage loan amount, and wave of mortgage and tax foreclosures are contributing factors. Investors then used land contracts to sell properties at significantly higher rates. The rise in land contracts in Detroit has resulted in a vicious circle being set up, as land contracts often end in foreclosures and looting investors continue to "chuck" land contracts by repeatedly "selling" and starting foreclosures on the same property. While there isn't enough data to know exactly how common land contracts are or how wealthy Black households

are in their abuse, there is enough data to show that land contract sales make up a significant portion of the housing market. This segment of the housing market is characterized by structural market flaws and distortions, as well as policy failures that disproportionately affect people of African descent. The question is whether these can be fixed.

### 4. Facilitating Use of Property Contracts by Buyers

Mortgages, on the other hand, are desirable, but they are not silver bullets. According to Zwiebach, "in a world where everything is perfect, a mortgage is almost always preferable to a land contract." "However, the housing market in Detroit is not nearly a perfect environment. Getting approved for a mortgage is not a straightforward process. There is widespread discrimination against people of color in the mortgage industry, and as a result, many people do not do so.

Taken together, these are fundamental, structural changes that form a sort of blueprint for reimagining the $200 billion land contract market as a practical alternative to mortgage financing that serves rather than exploits home buyers. The purpose of this redesign is to make land contracts a choice for financing homes. According to the paper's findings, land contracts can be drafted and managed in a way that proactively promotes beneficial outcomes for buyers. "In stark contrast to predatory land contracts created by dishonest sellers, many sellers motivated by a mission structure, a structure we call "supportive" land contracts. These are land contracts characterized by fair selling prices and clear terms and conditions. Land contracts, it serves as a tool for community development for these vendors and helps low-income non-white families increase homeownership rates and support neighborhood stability.

The research also recommends investments in expanding access to mortgage finance through programs such as Detroit Home Mortgage, which provides financing for properties with less than current market value. This will make our reliance on land operations a little less necessary. However, even in challenging areas like Detroit where access to mortgages has increased, there will still be large gaps in the market where mortgages are not accessible or a suitable match, and there will be demand for alternative financing. Redesigning land contracts can correct such

loopholes in a way that does not abuse and is beneficial to buyers, good-faith sellers and communities. This will be a meaningful change in basic assumptions in the fundamental dynamics of the low-priced housing market .

## 5. Making Secondary Market Preparations in Land Contracts

Titled "Good Faith," the article makes recommendations for a variety of measures that will both encourage "support" land contracts and increase access to mortgages. Some community development groups combine the two strategies, offering land contracts with supportive terms ranging from five to seven years, and then collaborating with buyers and financial institutions to convert the land contracts into mortgages after a two-to-five-year period. "Some people believe it's a really fascinating, untapped market," Zwiebach says, claiming that they "heard from banks that they're interested in refinancing land contracts."

John Green is trying to take this approach on a larger scale, and that's one of the ways the small dollar market is restructured. Blackstar Stability has appointed him to the Managing Director role. After ten years working for a large commercial real estate investment management firm in the Bay Area, during which time serving both large institutional clients and smaller emerging developers, he decided to leave the company and take part of his team to form Blackstar. other contacts with him . Focusing on high-impact initiatives in commercial real estate and single-family housing, it finds solutions that deliver attractive risk-adjusted returns, are scalable, and keep families at home.

Interest rates on land contracts can sometimes be unreasonably high. But instead of trying to make land contracts more supportive, Blackstar's strategy is to refinance them with mortgages that better protect buyers' rights and do so in bulk. This will be done to save money. The number of swimming pools Blackstar will buy varies from a few dozen to more than a thousand. Sellers are often investors making healthy returns on housing.

Such events tend to make headlines and have an impact on market participants. However, this is not the same as addressing issues related to the fundamental structure of the market. While litigation may limit bad actors on an individual level, it has limited impact on the crooked

incentives that primarily attract bad actors to the market. First, there is no guarantee that it will be successful. And even if agreements are made, it is necessary to make sure that they are adhered to.

This serves as a sign of how prohibition and enforcement rarely succeed in resolving structural problems in the markets, even though such issues require fundamental answers. Increasing the number of enforcement officers does not change the basic structure of a market or remove the perverse incentives embedded in it; all it does is increase the chances of some dishonest players being caught.

But for this to become widespread, innovation must first be made in the mortgage market itself. In its current state, the mortgage market is not suitable for refinancing land contracts. For example, one of the contributing factors to land contract abuses is the vacuum in the mortgage market and the absence of products designed to finance low-dollar homes.

If there were a secondary market for land contracts, it would change the game in the low-dollar housing market because it would push the market towards more responsible and fair financing. Establishing such a market will require a multifaceted and step-by-step approach: first, raising capital to buy land-contracted properties; second, to create a pipeline of underwriters that deal with mortgage products and can refinance them ; and third, creating actual pools and products to prove that refinancing mortgaged land contracts can work significantly. All these steps will be necessary to create such a market.

It's a simple approach that is what every innovator needs from having structural understanding to having proof of concept to scalable change. Blackstar has an extremely detailed plan that he is currently implementing for the next phases. He set up an equity fund with a first target of $100 million and has already secured more than $20 million. In addition, it now finds mission -oriented partners such as foundations and community development financial institutions that can supply funding.

The purchase of a property should not be taken lightly. It requires a significant amount of money in addition to an asset. As a result, it is especially important to make sure that legal protections are

in place. These assurances are provided to both the buyer and the seller by the purchase and sale contract or contract. However, understanding these conventions can be difficult. Sometimes it's hard to read and understand the whole thing. Your real estate agent and/or attorney can guide you through the home buying process. A real estate contract is called a purchase and sale contract. A real estate purchase agreement is a written agreement between a buyer and seller to complete a real estate transaction. The buyer is willing to buy the property for the agreed price. "The deed is an important legal document.

In some jurisdictions, the first offer usually comes in the form of a contract. When the buyer accepts the offer made by the seller, the offer becomes a legally binding agreement. If the buyer rejects the offer, the seller can make a counteroffer. Both parties are free to count an unlimited number of times until they reach an agreement with each other or one of them stops responding.

It's important to keep in mind that an attorney is often not authorized to write a contract from scratch, as doing so will establish law practice. On the other hand, this can be done by an owner-seller acting in their own interests.

### 6. Various Problems Increasing in Seriousness with COVID-19

The commercial real estate sector is facing a variety of challenges, especially with COVID-19 having an impact on institutional investors. Based on the idea of blockchain technology and tokenization, the RTX21 trading platform supplies a one-of-a-kind ecosystem for the real estate industry. This platform is offered by company RTX21, a partner of the Frankfurt School Blockchain Center. They see the provision of infrastructure and standards as the key to tokenizing pre-existing real estate assets as their primary purpose. Supplying a platform for mass investment in real estate-related items is not the goal of this effort. This is an interesting perspective because if adopted the emphasis will shift away from fundraising and more towards standardizing procedures and building infrastructure. With the help of blockchain technology, it is possible to reduce the number of intermediaries, opacity levels and costs to ensure a fair market environment that meets the ever-changing environmental needs of the industry. The commercial real estate

sector is advancing with the rest of the world. In addition to changes in the market and the inability to accurately predict the future, there is an increase in the volume of inquiries about procedural and technological options for project management and financing. During COVID-19, multiple concerns about the process will help the tokenization movement for commercial real estate using blockchain technology. This movement is separate from issues such as crowdfunding, suburbanization and rent securitization. This article not only analyzes the current situation and challenges, but also introduces a key supplier and partner of the Frankfurt School Blockchain Center. This should be of particular interest to institutional investors and property managers because of the revolutionary idea of "tokenization as a service". Before moving on to the explanation and solution of the concept of tokenization for commercial real estate, it is necessary to start by looking at the industry as a whole and the challenges it faces. The commercial real estate industry is already dealing with a variety of challenges, all of which are expected to become much more serious when COVID-19 appears. To begin with, there are procedural difficulties because of a high degree of project-related financial movements and hazardous materials leading to problem areas. These problem areas can be mitigated and improved with the use of blockchain technology. The higher the scope of the project, the greater the potential for failure, as is usually the case. In conclusion, the concept of platform-based and tokenized liquidity management solutions is particularly relevant in the context of corporate project scope. For a real estate transaction or management procedure to take place, first, there must be many intermediaries. These include a wide range of professions such as lawyers and brokers, as well as financial institutions and asset managers. This can result in significant expenses for both the owner and the buyer or tenant of the property. In addition to the organizational and procedural frictions that may arise as a result, the time needed for these activities can grow in proportion to the number of intermediaries involved. It is also not guaranteed that agents trust each other, so extra tasks such as internal controls and audits are needed for many process stages to cut the associated distrust. As a result, inefficiencies are at the top of the priority list. Blockchain technology has the greatest potential use in this field as it is an effective solution to develop trust and enable a frictionless world of transactions. There are also challenges that arise because of the immovable nature of commercial real estate facilities and their dependence on the surrounding community. For example, natural disasters, construction

delays or even construction errors can have a direct impact on the liquidity of the project. This is especially true when the procedural inefficiencies discussed earlier are added to the mix. The use of blockchain technology does not make it possible to reduce the dangers posed by physical hazards; however, it can make the process of finding solutions to problems more time and cost efficient.

As mentioned earlier, the liquidity problem that arose under unusual circumstances is related to the third main external defect.

A distributed peer-to-peer technology known as blockchain can be conceptualized as a distributed ledger that is transactions (Peters & Panayi, 2016). It is a kind of distributed ledger technology originally designed to manage cryptocurrency transactions (Brühl, 2017; Nakamoto, 2008). (Nowiski & Kozma, 2017) While blockchain technology is still in its infancy, there is excitement about the technology's potential to have a beneficial impact on economies and disrupt existing business practices. In addition to its early uses in cryptocurrency, the usefulness of blockchain lies in its ability to record transactions over a network for users to access. It has also been suggested that blockchain technology can reduce the time needed for transactions while increasing system transparency and reliability (Pinna and Ruttenberg, 2016). As a result, the functionality and use of blockchain technology has moved beyond a trading currency towards secure, decentralized smart contracts that can record and track asset ownership (Bal, 2017). Blockchain platforms are helpful for markets when technology helps speed up many procedures that supply greater security and transparency to the market. Such markets include cryptocurrency markets. As a result, blockchain technology has continued to evolve for applications in a wide variety of industries and fields of work. This technology can shake up existing markets as it will result in the creation of a digital economy. The real estate industry is one that could see improvements because of the use of blockchain technology. The real estate market has always been seen as an inefficient market plagued by a lack of transparency, high transaction costs and slow transaction procedures . However, contemporary trends have begun to change this feeling (Shiller, 2007). A paper-based real estate transaction system has been portrayed as slow due to the process of re-verification of information and the manual components involved in confirming the transaction. It has also been described as inefficient and error-prone, due to the availability of relevant manual components

(Graff & Webb, 1997; Marsh & Zumpano, 1988). Fraud actions are also possible in this market, such as title fraud, double termination, paper flipping (also known as property fraud), and mortgage fraud (Cardoso & Annett, 2017; FCT, 2017; Malik & Foxcroft, 2016). Listing, finding, valuing, negotiating and ultimately executing a deal are typical procedures for buying or selling real estate (Crowston and Wigand, 1999). Unfortunately, an agent (also known as a dual agent) being both the buyer and seller can use either party to further their personal interests in any of these processes. In the case of listings, a dual agent can limit or choose what types of properties they provide to potential buyers. A dual agent can persuade clients to visit specific properties that fall directly into their portfolio while buyers are in house searching . And throughout the appraisal process, a dual agent may apply subtle or excessive pressure on customers to skew their decisions, such as encouraging them to commit to a higher price than current market value. A bilateral agent can negotiate with both parties at a pricing point designed to maximize the dual agent's own three-way fee . And finally, during the execution phase, a dual agent may unreasonably speed up the transaction process to meet their interests in moving to the next client. This was to be done to fulfill their own interests. Codes of ethics have been developed in various countries to curb such incidents by educating, regulating and monitoring the activities and responsibilities of transaction intermediaries (Jennings, 2011). Because of the principal-agent relationship, real estate agents have a moral and fiduciary obligation to serve the best interests of their clients and work towards achieving their clients' goals (Rutherford, Springer, & Yavaş, 2005). Because it is built on a percentage-based fee structure, the current model for the brokerage system is not immune to fraudulent actions. This is because the system has the potential to develop a bias between the agent and the primary customer. For example, when selling a house, the seller's goal is normally to get the highest price possible. In addition, the real estate agent being the seller may also have the goal of getting the highest possible price for the house sold (which results in a larger commission), but they will strive to make it happen.

## 7. Conclusion

As a result, the enigma has the potential to cause a conflict of interest between the seller and the agent. In addition, real estate agents often incur costs in the form of advertising, organizing open meetings, escorting visitors, and negotiating trading deals (Levitt & Syverson, 2008). However, because these agents only charge a small percentage (typically between 1.5 and 3 percent) of the bargain price, there is a concern among agents that they will often not be able to recoup the time and effort involved in selling or finding a home. This is because these agents receive only a small percentage of the negotiated price (Levitt & Syverson, 2008). As a result, some real estate agents are likely to be encouraged to engage in unethical activities to maximize their income. One strategy that can be used in this context is double termination. It is possible that double termination does not fall under the category of prohibited action in all jurisdictions. Double-sided fraud, also known as double-sided fraud, is when a real estate agent is both the buyer and seller and tries to possibly double the money earned at the seller's expense (Jennings, 2011). ; Malik and Foxcroft, 2016). Duplicate sales in service-based transactions such as real estate can cause unethical sales behaviors, problems in the quality of the service provided, and pressure on the relations between the agency and the customer (Lee, 2012). It is a type of fraud that does not appear until the transaction is concluded (Galaty, Allaway, & Kyle, 2008). In addition, because individuals are naturally inclined to maximize their own utility, double termination can also devalue their own work while generating opportunistic incentives for agents to increase their profits (Holmstrom, 1979). This is like the ideas of agency theory , which says that individuals act in their own self-interest and in response to perceived incentives ; may encourage agents to violate the moral duty of agency representation (Eisenhardt, 1989; Kadiyali, Prince, & Simon, 2014; Perrow, 1986). Data mining techniques are the subject of a sizable part of research on the phenomenon of fraudulent behavior (see 2016). This article adds to the growing research on fraud by focusing on the upstream prevention of fraudulent behavior through the application of blockchain technology to better ease the reliable flow of real estate transactions. This approach broadens the scope of the existing fraud literature . The aim of this project is to supply systems and procedures that prohibit double-sided fraud, while increasing transaction efficiency, preventing unethical agent behavior, increasing accuracy and increasing transparency . There are two main reasons why blockchain technology supplies a solution to the doubling problem. Blockchain is a distributed ledger that uses

cryptographic links, having verified blocks structured in an add-only, sequential chain. First, it allows for transaction transparency that encourages honest behavior, as dishonest activity will become visible and subject to penalties. Second, it decentralizes authority over the trading ledger, ensuring that no participating party "plays" the system. As a result, it supplies a higher level of protection than would be provided by allowing recipients to access a public database. Even in a market that is closed to further offers, binary agents can hide some key offers from their vendors using a public database. This is because the public databases having all the postings do not have any information about the offers. The proposed approach, based on blockchain technology, has the potential to alleviate this problem by allowing the seller to access all offers directly to TBB if they wish. In the absence of TBB, the seller relies on his agent to give offers that may or may not run in a completely clear manner. Even if there is a public database having all offer information, there may be a central database having such information belonging to a single legal entity (i.e., real estate brokerage). Even with the help of the broker, in this scenario it is possible for a broker to simply change the information (because he may have a personal stake in closing deals).

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