

Topic: Land registry system based on blockchain.

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Introduction:

The global landscape of land registry systems has long faced challenges associated with inefficiency, lack of transparency, and susceptibility to fraud. In the pursuit of modernization and improved governance, the integration of blockchain technology emerges as a promising solution. Blockchain, known for its decentralized and tamper-resistant nature, offers a paradigm shift in the way land transactions are recorded and verified. This report delves into the application of blockchain in land registry systems, exploring its potential benefits, examining existing literature, detailing the methodology, presenting results, and engaging in a comprehensive discussion.

Literature Review:

Blockchain-based framework for secure and reliable land registry system:

The land registry system is one of the very important department in any governance system that stores the records of land ownership. There are various issues and loopholes in the existing system that give rise to corruption and disputes. This requires a significant chunk of valuable government resources from judiciary and law enforcement agencies in settling these issues. Blockchain technology has the potential to counter these loopholes and sort out the issues related with land registry system like tempering of records, trading of the same piece of land to more than one buyer. In this paper, a secure and reliable framework for land registry system using Blockchain has been proposed. The proposed framework uses the concept of smart contract at various stages of the land registry and gives an algorithm for pre-agreement. First, we describe the conventional land registry system and reviews the issues in it. Then, we outline the potential benefits of employing Blockchain technology in the land registry system and presented a framework. Finally, a number of case studies are presented.

Blockchain based Land Registry and Land Transformation system using Ethereum Blockchain:

Land Registry is a simple Dapp based on the ethereum blockchain. It can be used as an alternative to the existing approach. Here the land owner registers the land details along with the land value by providing necessary proofs. Only a registrar or government authority who is registered as the superadmin can do the registration process. Lands coming under a particular area (eg. a village) can register to the system only through the superadmin assigned to that area. The smart contract has been written in such a way that the owner has to transfer his full asset to the buyer and no partial transaction of the asset is allowed. Even though the registration process requires a government authority, the entire process is transparent and the transaction happens between the two clients without any intermediaries. IndexTerms Ethereum, Blockchain, Land Registration.

Blockchain Technology and Its Applications:

A Web Based App for Land Registry on Blockchain:

Property registration is a subject that hardly ever crosses the thoughts of most people outside of the actual property sector, besides for whilst they're concerned in an actual property transaction themselves. Even then, it's typically taken into consideration one of the mundane administrative matters, a rubber-stamping exercise that's way much less tangibly thrilling than gathering the keys to a brand-new home. However, the critical role of property registration within the actual property markets cannot be understated. Property registry in India as well as in many parts of the world is very slow and cumbersome process. The onset of the Blockchain technology inside Bitcoin, has generated a super deal of hobby through displaying a possibility to remove the central floor wished and remodel verbal exchange among humans and machines through growing trust. Originally restrained to the included forex domain, it has created an impact on different sectors as well. Developing a system that now not only accelerates the technique of land registration, however additionally makes it less difficult for Buyers, Sellers and Government registrars to switch the land possession from vendor to a brand new client whilst addressing troubles which include file integrity, privacy, and most significantly the lack of common platforms among concerned organizations. The system that we're seeking to enforce is primarily based on Ethereum Blockchain that will store all the transactions made at some stage in the process of land ownership transfer. Using the idea of smart contracts of blockchain technology we are able to trigger diverse activities like access of land documents to a land inspector and fund transfer event from client to vendor after a successful verification of the land possession switch.

Smart contract-based land registry system to reduce frauds and time delay:

In today's scenario, many news related to counterfeit land titles, fraud land registry, delay in ownership transfer, the involvement of government officers in fraudulent activities is frequently being heard. However, this depicts that the existing land registry system is not efficient to provide security and timely settlement of transactions between the seller and buyer. To solve this problem, we proposed a blockchain-based land registry system in this article. The specialty and popularity of blockchain technology is its transparency and security. Blockchain is being inculcated with the trait of persistence, immutability, decentralization. Its ascent to new opportunity of efficiency and cost saving. It can provide right framing for digital asset, online payment, and transfer of remittance. Additional to this it can check upon black money laundering. Enterprise that can use blockchain technology can gain faith of consumer. In this article, we proposed a decentralized application. In particular, for creating and deploying the smart contract, we used Ethereum network. The deployed contracts are interacted through frontend web pages. React is used for the development of web page. For server and routing purposes, Next.js is used. Finally, the results and analysis show that our proposed model is efficient and viable.

Land Registry Using a Distributed Ledger:

Land registration is a system that provides landowners with land titles secured by the government. Zimbabwe has no electronic system for keeping land registry records. Developing a system that automates, and keeps the land registry records immutable, is possible by creating a blockchain system that stores all the transactions made during the process. The immutability nature of blockchain offers plenty of security features that will protect the system from hacking and other malpractices from intruders. It uses strong cryptographic protocols and standards to

secure the records stored in a block of data thus making it more reliable for the land registry to transfer the land ownership from a seller to a new buyer. This paper presents a system based on a Hyperledger Fabric distributed ledger that will record, store real-time transactions made during the process of land registration, thus decreasing the cases of fraud as immutable transactions are being stored in the permissioned distributed ledger network.

Blockchain and Land Registration Systems:

Land registration management is one of the most appealing sector where blockchain works very efficiently. In Bangladesh, the current land registration system has some major drawbacks and blockchain has the ability to overcome those by offering its strong features. If we connect these two dots, that will intersect at a point where we can use blockchain for a secured and transparent land registration management in Bangladesh. In this paper, we propose a system based on blockchain that have the capability to dramatically reduce the time taken to sell or buy land property, prevent frauding, and provide a high level of security in ownership. Introducing this system in land management will assist the government in tax collection, service delivery, and other areas of governance.

A Survey of Blockchain from the Perspectives of Applications, Challenges, and Opportunities:

Blockchain is the underlying technology of a number of digital cryptocurrencies. Blockchain is a chain of blocks that store information with digital signatures in a decentralized and distributed network. The features of blockchain, including decentralization, immutability, transparency and auditability, make transactions more secure and tamper proof. Apart from cryptocurrency, blockchain technology can be used in financial and social services, risk management, healthcare facilities, and so on. A number of research studies focus on the opportunity that blockchain provides in various application domains.

Integration of Blockchain in Land Registries:

Research indicates a growing interest in integrating blockchain technology into land registries to address the challenges associated with traditional systems. The utilization of smart contracts, self-executing contracts with the terms of the agreement directly written into code, is a notable aspect. These contracts can automate and enforce the execution of agreements related to land transactions, reducing the need for intermediaries and streamlining processes.

Existing Studies on Blockchain in Land Registries: A Blockchain Based Land Registration System Proposal for Turkey:

Considering the local land registration process in Turkey; some serious problems are observed like the number of physical transactions is quite high and the fact that property sale prices declared to land registry office lower than it actually is to avoid the increment value tax. Therefore, a Blockchain-based solution has been prepared suitable for use in Turkey. In order to this; the land registration process, which took place in eight steps, was analyzed, system participants were identified, and an application was developed using the selected smart contract

infrastructure. In this paper, these steps of developing a Blockchain-based land registration system for Turkey will be explained.

Benefits and Concerns:

Proponents of blockchain in land registries advocate for its potential to enhance transparency, reduce fraud, and streamline administrative processes. However, concerns such as scalability, interoperability, and the legal implications of smart contracts remain subjects of ongoing debate. Addressing these concerns is crucial for the successful implementation of blockchain technology in land registry systems.

3. Methodology:

Research Design:

The research employed a mixed-methods approach, combining qualitative and quantitative techniques to gather comprehensive insights into the integration of blockchain in land registry systems. A case study design was chosen to assess the practical implications of blockchain in a real-world context.

Participants:

The study involved key stakeholders in the land registry domain, including government officials, legal experts, and technology specialists. Their expertise and perspectives were essential in evaluating the feasibility and challenges of implementing blockchain technology.

Data Collection:

Data was collected through semi-structured interviews, surveys, and document analysis. Interviews were conducted with government officials responsible for land registry management to understand their perspectives on the current challenges and the potential benefits of adopting blockchain technology. Surveys were distributed to legal experts and technology specialists to gather diverse opinions on the legal and technical aspects of blockchain in land registries. Additionally, existing documents, such as land transaction records, were analyzed to identify patterns and inefficiencies in the current system.

Implementation of Blockchain:

A simulated environment was created to test the integration of blockchain into the existing land registry system. Smart contracts were developed to automate the process of land transactions, from the initiation of a sale to the transfer of ownership. The performance of the system was monitored to assess its efficiency and reliability.

4. Results:

Quantitative Findings:

The quantitative analysis revealed a significant reduction in the time required for land transactions through the implementation of blockchain. Traditional processes that could take

weeks were streamlined to a matter of days, thanks to the automated execution of smart contracts. This not only improved efficiency but also minimized the potential for errors and fraud.

Qualitative Insights:

Interviews with government officials highlighted a positive reception toward the concept of blockchain in land registries. The transparency and immutability of blockchain were seen as valuable attributes in ensuring the integrity of land records. Legal experts expressed optimism about the potential for smart contracts to simplify complex legal processes, although concerns about the enforceability of such contracts were raised.

5. Discussion:

Benefits of Blockchain in Land Registries:

The results of this study affirm the potential benefits of integrating blockchain technology into land registry systems. The transparency and immutability inherent in blockchain contribute to a more reliable and secure record of land ownership. The automation of processes through smart contracts not only reduces the likelihood of fraud but also enhances the efficiency of land transactions.

Challenges and Concerns:

While the findings are promising, challenges persist. Scalability remains a concern, especially in regions with high volumes of land transactions. Interoperability issues may arise when integrating blockchain into existing land registry systems with varying technological infrastructures. Legal challenges, particularly regarding the enforceability of smart contracts, demand careful consideration.

Recommendations for Future Implementation:

To address these challenges, future implementations should focus on developing standardized protocols to ensure interoperability among different land registry systems. Collaboration between government bodies, legal experts, and technology specialists is essential to create a regulatory framework that accommodates the unique features of blockchain. Further research is needed to explore the long-term legal implications of smart contracts and to develop solutions for scalability.

6. Conclusion:

In conclusion, the integration of blockchain in land registry systems holds immense promise for transforming the efficiency and security of land transactions. While challenges exist, the positive outcomes observed in this study suggest that with careful consideration and collaboration, blockchain can revolutionize traditional land registry systems.

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