LAND REGISTRATION USING BLOCKCHAIN

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Abstract—Land registration authorities frequently face criticism for alleged mismanagement and manipulation of land records across various nations. Pakistan, in particular, grapples with a heightened susceptibility to falsification and corruption in its property records due to economic challenges. This vulnerability results in conflicting claims of authority over specific parcels of land. The consolidation of this data further exacerbates the susceptibility to security threats.

Efforts in decentralized system research aim to enhance the reliability of land registration systems. To address the shortcomings of centralized systems, ongoing development focuses on blockchain- based decentralized systems. Leveraging significant land record registration models as the foundation of this research, our objective is to establish a proof-of-concept system or framework with future applications in mind. The proposed conceptual framework holds the potential to benefit Pakistan's land registration agency by enhancing security and efficiency. In advocating for the implementation of a decentralized land record registry system by the Pakistani government, we present a conceptual framework outlining essential components. This framework aims to provide a robust foundation for the development of a more secure and transparent land registration system in Pakistan.

I. INTRODUCTION

Land registration procedures in any given country are acknowledged to be intricate and involve multiple steps, necessitating the involvement of all stakeholders with direct or indirect interests in the registration process. The existing system for storing land record titles presents significant challenges related to data integrity, the safeguarding of highly sensitive information, and the susceptibility to system failures, particularly in the event of natural disasters that may incapacitate the server responsible for data storage. Addressing these issues requires the development of a more robust and secure system to enhance the overall efficiency and reliability of land registration processes.

In contrast to existing methods of land management and data storage, blockchain stands out as an innovative a technology and database with potential to effectively tackle the issues inherent in current systems. A fundamental and pivotal characteristic of blockchain technology lies in its decentralized network structure, wherein data provided by a specific node undergoes confirmation by all other nodes within the network. Only after a consensus is

eached among these nodes does the shared data get recorded on the blockchain. This decentralized and consensus-driven approach distinguishes blockchain, offering a promising solution to the challenges faced by conventional land title management and data storage systems.

Diverse platforms currently in use to establish trustworthy, decentralized, transparent, immutable, and secure blockchain-driven systems for land registration and management. Notably, smart contracts built on the Ethereum blockchain have been garnering attention within this realm. As an open and public blockchain platform, Ethereum facilitates broad participation in the blockchain ecosystem, offering unique opportunities for stakeholders to engage in the process.

Numerous endeavors undertaken to integrate emerging technologies like blockchain into land record management systems, aiming to enhance the security and sustainability of land data. Notably, the UAE has been at the forefront of such initiatives, pioneering a strategic approach integrate blockchain into various projects. The Dubai Land Record Authority, as a pioneering government agency, stands out as one of the early adopters, successfully transitioning its land titles onto the blockchain. This forward-looking approach showcases the commitment to innovation and modernization within the realm of land record management.

Nonetheless, in developing nations such as Pakistan, the accessibility and effective management of land records pose significant challenges. Unlike Punjab, where land data is computerized, the provinces of Sindh, KPK, and Baluchistan still rely on traditional methods, overseen by a central figure called a "patwari," who maintains crucial data in extensive paper-based registries. Recognizing the need for improvement, the Punjab government introduced the "Punjab Land Record Management Information System" to streamline the intricate process of recording and managing land records. Although the digitalization of documents has expedited procedures, concerns about security, resilience, and traceability persist. The absence of robust infrastructure for the land registry system leaves property records susceptible to inconsistencies, inaccuracies, and potential tampering. Overcome these challenges needs comprehensive measures to

fortify the security and integrity of the land record management system.

A blockchain is a continuously expandable list (chain) of records (blocks) that are connected via encrypted data exchange. Each block typically contains a reference to the previous block, a timestamp, and transaction data. One of the most popular blockchain applications is the cryptocurrency Bitcoin. Due to the fact that the transaction data on all applications (clients) are visible for everyone and traceable stored, this system is considered tamper-proof and transparent.

2. LITERATURE SURVEY

The analysis taken for research is synthesized in a tabular presentation, offering a thorough synopsis of pertinent research endeavors. This table encapsulates essential information, including the study's title, authorship, publication year, research goals, and the noteworthy merits and drawbacks identified in each investigation.

[1] Introduction to blockchain. In 2016, They Introduce the foundational concepts of block chain technology. Decentralization, immutability, transparency are the advantages. Scalability concerns, energy consumption are the disadvantages.

[2] Overview of Land Registration. In 1858, They Explore traditional land registration processes and challenges. Historical documentation, legal clarity are the advantages.Paper-based inefficiencies, susceptibility to fraud are the disadvantages.

[3] Security and Immutability in Land Registration. In 2018, Examine how blockchain enhances security in land records.Immutable records, resistance to tampering are the advantages.Dependence on network security, potential for 51% attacks are the disadvantages.

[4] BlockChain in Real Estate and Land Registration, Investigate the potential benefits of blockchain in real estate.Enhanced security, reduced fraud, increased transparency are the advantages.Initial implementation costs, regulatory uncertainties are the disadvantages.

[5] Decentralization Privacy: Using BlockChain To Protect Personal Data. In 2015, Compare different block chain-based land registration systems.Informed decision-making, identification of best practices are the advantages.Limited standardization, varied system performance are the disadvantages.

[6]Smart Contracts in Land Registration. In 2014,Explore the role of smart contracts in automating land transactions.Automation, efficiency gains, reduced intermediaries are the advantages.Legal and regulatory uncertainties, complex coding are the disadvantages.

[7] The Bussiness BlockChain, Mougayar.W. In 2016, Analyze the real-world examples of blockchain in land registration.Successful implementations, lessons learned are the advantages.Adoption challenges, technical hurdles are the disadvantages.

[8] Tranforming Your Bussiness and Our World, Tapscott.D, Tapscott.A. In 2017, Examine how blockchain integrates with current land registration systems.Improved interoperability, streamlined processes are the advantages.Legacy system compatibility issues, transition challenges are the disadvantages

3. CONCLUSION

In conclusion, The survey of existing research paper in8 Land registration is implemented using blockchain-based registration enhances security. It involves 200 transactions across 12 nodes, using the SHA256 algorithm for secure transactions. User info is stored securely, and transactions are verified using elliptic curve cryptography. The system ensures transparency with a registration office page listing user details and property transactions. Difficulty levels maintain secure mining, and Merkle trees validate and link the chain efficiently. This approach simplifies land registration while ensuring security and transparency

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