

# “LAND REGISTRATION AND RECORD MANAGEMENT USING BLOCKCHAIN”

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**Abstract-** Management of land records and revenue records has been going on since time immemorial, in which Improvements and changes have been made from time to time. At present, once again the need for improvement and new thinking in this system is being felt. In the twenty-first century, technical intervention will be an integral part of these reforms. Blockchain technology is one of the various technologies that can prove to be effective in the management of land records and revenue records. There is a need to use the land records and revenue records management on a large scale with the help of blockchain technology so that the land records and revenue records management can be improved. The traditional land registration process is a slow and laborious process, involves many intermediaries, and has maximum chances of fraudulent and fake land transfer. The data of the land is stored in a single place leading to security issues also. Blockchain is a perfect domain for the land transfer process. In this study, a land registration system using blockchain is proposed to overcome the above mentioned limitations of the land registration system. Land being an important asset, the use of blockchain technology can help improve this sector in its work implementation as well as its characteristics significantly for a seamless and hassle free work flow to achieve a reliable system

**Key Words:** Blockchain, Land record, Decentralised, Cryptography.



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## INTRODUCTION

The process of land registration in any country is known to be a multistep process, since it entails the engagement of all stakeholders who will have a direct or indirect stake in the registration. The currently used land record title storage system raises major issues about data fraud, the security of highly sensitive data, and the risk of system failure due to natural disasters, such as the server used for data storage going down [1]. Compared to the current approaches and procedures for land title management and data storage, blockchain is a cutting-edge technology and database that has the ability to completely address the problems that plague current systems. The basic and most important aspect of blockchain technology is that it is a decentralized network in which all data supplied by a single node are confirmed by all other available nodes, and only after a consensus is made can then the shared data be saved to the blockchain [2].

There are various platforms being used for the creation of reliable, decentralized, transparent, immutable, and secure blockchain-based land registration and management systems. Smart contracts based on the Ethereum blockchain are gaining traction among these systems. Being a public blockchain platform, it allows anyone to participate in the blockchain ecosystem [3]. Despite the fact that digitalization of documents and other related data has speed up the process, security, resilience, and traceability remain important concerns. Due to a lack of infrastructure for the land registry system, property records are particularly vulnerable to inconsistent, inaccurate, and tampered data.[4]

Blockchain technology offers decentralized environment that is reliable and secure. The process of the land management and title recording system is being used for storing land title facts and running the transactions

that are intertwined in land titles. Since these records are sensitive, land management and title cataloging systems must be robust in order to prevent falsification, make these records available at all times, and, most importantly, complete these operations in a timely manner [6]. Blockchain is no longer limited to simple principles; it has evolved into a hybrid of several replicas, including mathematics, networking, cryptography, and a distributed consensus algorithm [5].

Blockchain was developed from bitcoin paper published by Nakamoto in 2008. It is a peer-to-peer network where all participants (peers) serve as a node and all the nodes hold the same information [6]. Blockchain is a ledger dispersed publicly above a network that registers transactions associated bordered by other network applicants [7]. Instead of relying on the single authority such as administrators that can forge the database, blockchain technology offers decentralized environment that offers robustness and security as well. Untrustworthy administrators can abuse this power. A normal database suffers from that issue which is the failure that occurs at a single point, and it makes them to depend much on backups if some failure occurs. Moreover, due to this failure if both, i.e., backups and an operating database are abused, it is catastrophic [8]

## **LITURATURE SURVEY**

**“Role of Blockchain Technology in Digitization of Land Records in Indian Scenario”, P Singh** Blockchain is a way of passing data (such as records, events, or transactions) from one party to another in a very secure way. It is an electronic record of information that requires digital security. All data stored in the blockchain is immutable; once a piece of data enters into a blockchain, it is practically impossible to alter its value. The Blockchain has changed the model from a centralized way of traditional business to the decentralized model of the blockchain, that means there it can run without any central authority. It works on Peer to Peer Model rather than Peer-Mediator-Peer. The Blockchains makes the process easier, fastest, and trustworthy to deal with businesses as it follows Peer to Peer nature Blockchain. It has become the most used business model in different industries, such as construction industries, as it is the safest, fastest, transparent, and it also is more comfortable to implement. The critical feature of the blockchain that makes it today’s most potential technologies are: decentralized, self-control, peer- to- peer relationship, fixed record and time stamping. Thus, this chapter focuses on the pivotal role and application of BlockChain technology on the digitization of land records of the Indian Scenario.

**“Secure Digitization of Land Record using Blockchain Technology in India” Kalpana Samal; Bhabendu Kumar Mohanta; Surai Sharma; Debasish Jena** verification process is lengthy and final processing is also time-consuming. With the development of Information and Communication Technologies (ICTs), the records are converted from file to digital. Still, there are several challenges are there to make the land management system effective and trustworthy. During the buying or selling process, different middlemen exist at various levels which makes the process complex and risky. There is a chance of duplication or forge of digital documents by the fraudulent person. To eliminate the above challenges in this paper Blockchain-based approach is applied to make the land record management system secure. The paper initially described the overall challenges that exist in the land record system in the India scenario. The authors in this paper proposed a Secure distributed architecture for land record management. Ethereum platform is used for the implementation of the land record digitization. The results analysis show that the system becomes faster, transparent, records are immutable by the use of Blockchain technology.

**“A Blockchain-based Land Title Management System for Bangladesh”; Kazi Masudul Alam, J.M.Ashfiqur Rahman, Anisha Tasnim, Aysha Akther** Bangladesh is a small country with a large population. Its increasingly developing economy further makes land a lucrative source of fixed capital. On the other hand, land titling is a cumbersome and lengthy process, where different government bodies process different sets of documents, and bureaucratic loopholes encourage fraudulent activities by organized people. As a result, the current model suffers from good governance. In this paper, we propose a Blockchain-based solution that offers data synchronization and transparency, ease of access, immutable records management, a faster and cheaper solution. Considering the technological knowledge and capacity of the people and the government, we introduced a phase by phase Blockchain adoption model that starts with a public Blockchain ledger and later gradually incorporates two levels of Hybrid Blockchain. We provide detailed smart contracts design of the public Blockchain and implement a prototype system using Ethereum. Our experimental setup

uses local and live Ethereum test networks to demonstrate the efficacy of the proposed system. Our analysis shows that the proposed model reduces the number of required travels, the overall cost of information processing as well as provide easy access to vital information. As a result, Blockchain adoption can improve the land title digitization effort of Bangladesh.

**”Blockchain-Based Land Registration System: A Conceptual Framework”** **Jawaid Iqbal, Ahmad Alturki, Saddam Hussain ,Amerah Alabrah and Syed Sajid Ullah** Land registration authorities are frequently held accountable for the alleged mismanagement and manipulation of land records in various countries. Pakistan’s property records are especially vulnerable to falsification and corruption because of the country’s poverty. Different parties therefore claim varying degrees of authority over a specific piece of land. Given the fact that this data has been consolidated, it has become significantly more vulnerable to security threats. The goal of decentralized system research has been to increase the reliability of these systems. In order to fix the flaws of centralized systems, blockchainbased decentralized systems are currently in development. By using significant land record registration models as the basis for this research, we hope to create a proof-of-concept system or framework for future use. Pakistan’s land registration agency will benefit from our proposed conceptual framework. For the Pakistani government to implement a decentralized land record registry system, we propose a conceptual framework that outlines the essential components.

## **PROJECT IDEA**

The process of the land management and title recording system is being used for storing land title facts and running the transactions that are intertwined in land titles. As these records are sensitive, land management and title cataloging processes should be strong in order to avoid falsification, making these records available all the time, and more importantly, these processes should be completed in a very short span of time. The functionality of blockchain also considered a digital register. Blockchain-based land registry schemes use the same functionalities as sound land registry systems have. At the same time, blockchain knows that these assets are owned by that person and also at what time a particular transaction took place.

## **PROBLEM STATEMENT**

The manual system of record keeping has proven ineffective, with opacity, late or non-updates, corruption, and harassment of the public. Indian Government took the decision to launch web-based Integrated Land records management System as an answer to all these problems by ensuring interconnectivity among the Revenue Circle, Sub-registrar, Deputy Commissioners’ offices and the Directorate of land Records. . The current land registration system is riddled with inconsistencies and inefficiencies, resulting in the loss of land records, with citizens bearing the brunt of the consequences. Thousands other people are also facing a similar situation

## **SCOPE OF PROJECT**

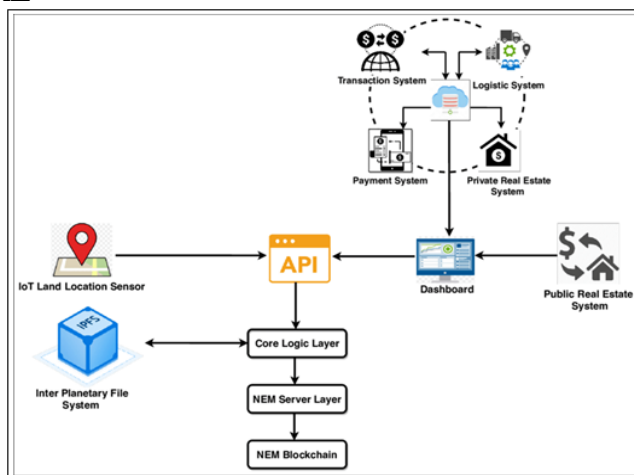
The land registry uses Blockchain to ensure the secure transfer of land property. The transparency of Blockchain allows for the tracking of changes to land papers. In this evolving era, the introduction of Blockchain technology to the land register is proving to be extremely beneficial. It is assisting in the upliftment of the disadvantaged and underprivileged sections of society by combating illicit land authorization.

## **GOALS AND OBJECTIVES**

- Farmers will be confident that their land ownership will not be altered by rogue individuals.
- Farmers can readily receive loans. As soon as the farmer repays the loan, the details pertaining to obligation in the Record of Rights can be updated. This allows the farmer to take use of various benefits and services.
- When the agricultural, horticulture, and animal husbandry departments’ services are recorded on the blockchain, these departments will be able to ensure that the needs of the farmers are addressed.
- Property registration blockchain data will be made available for verification in the Registration software’s work flow system as well as to the general public. This will give you all of the information on the property chain, from the first buyer to the last. The Purchaser does not need to rely on any untrustworthy persons or agencies to verify the legitimacy of the seller’s paperwork.
- Citizens and the registration department would have access to a

repository of transparent, reliable, and tamper-proof Property Registration documents. • It ensures that everyone has simple access to their land's records

### SYSTEM ARCHITECTURE



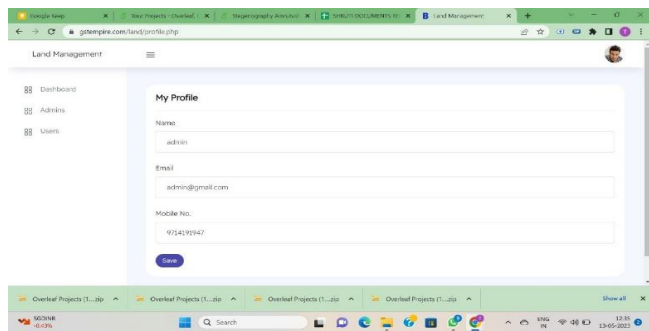
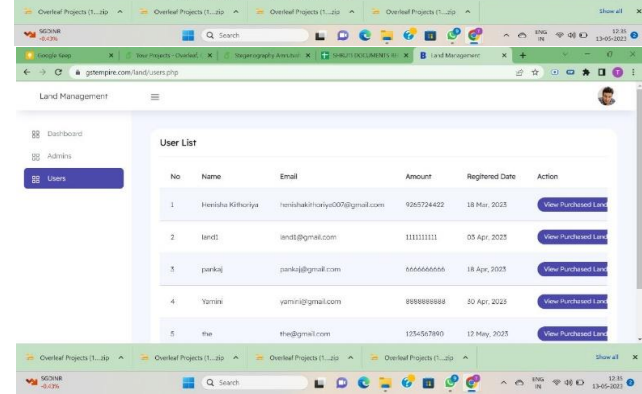
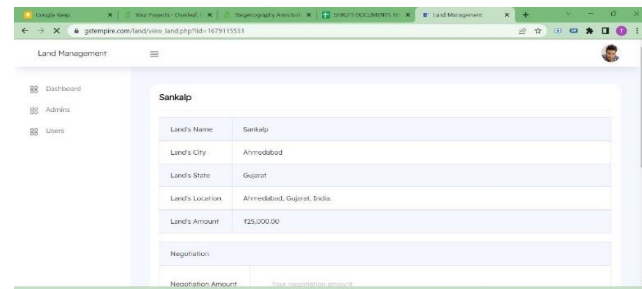
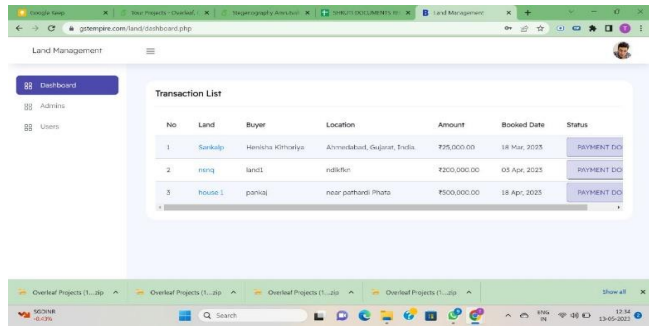
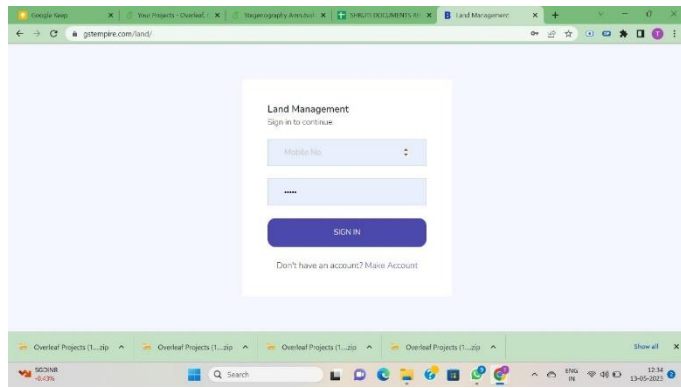
**Fig -1:** System Architecture Diagram

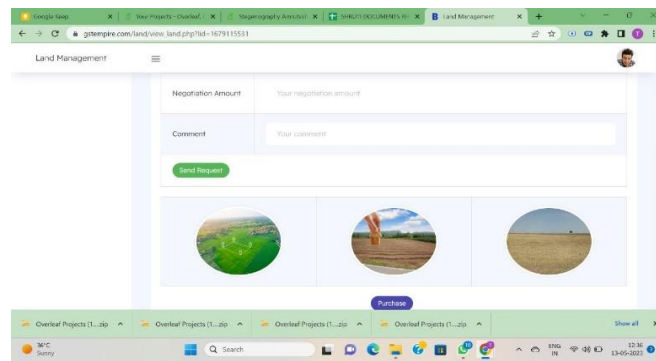
Land records data, unlike other data, must be accurately stored in the blockchain. After clearance by State Revenue authorities, the existing history of transactions on a piece of land must be entered into the blockchain. The data that has been authorised will be digitally signed and kept. Any mutation will begin with this as a starting point. The Revenue Department's certificates will be maintained in the blockchain and can be utilised by other authorities, such as banks, for any verification process related to a land parcel / farmer transaction. Other departments begin transactions involving change of ownership, such as sales, loans, mortgages, mortgage releases, and crop updates. The verification of the details must be done using blockchain data during the initiation of the above-mentioned transactions. The transaction details should be stored in the blockchain after approval of the transaction in the corresponding database, such as completion of deed registration / approval of loan by the bank. Before starting a sale, the registration department will retrieve information about a survey number from the blockchain and verify that the prospective seller indeed owns the land piece. The scanned document should be transferred into the Blockchain Network to form a block when the purchaser and seller have signed the sale deed. The block cannot be changed or updated once it has been created. When a property title is transferred from one person to another, a chain of blocks is generated. Certain occurrences, such as land registration, can automatically trigger a mutation request in the land record, loan approval by the bank can update the rights and liabilities, and crop details updation can prompt the updation of cultivators and crop details in RTC. Smart contracts can also help farmers receive subsidies in the event of crop failure. When an entitlement is only available to particular types of farmers, the blockchain can be used to determine eligibility.

### APPLICATION:

1. Public sector
2. Government Sector (PWD)

### RESULT





## CONCLUSION

In this system, Blockchain technology helps to overcome the problems faced in land records management such as tampering of records, loss of records in a fire or disaster, intentional damage to records, expenditure and destruction of archives, theft of records. Apart from this, where there will be another reduction in matters related to revenue claims like conversion of agricultural land into nonagricultural land, demarcation, arbitration, removal of illegal encroachment from the land, etc., it will be easier to settle them. At present there is a provision of revenue archives at Collectorate and Tehsil level. Where revenue records are maintained. While there is a huge expenditure in the maintenance of the archives, it is also felt that some of the archives are not being maintained properly. There are many reasons for lack of staff and budget, loss in efficiency of personnel etc. It is also true that the maps and other records engraved in the paper can be saved from fire, water, disaster. Avoiding it is a big challenge. Blockchain technology can overcome these shortcomings of the current record keeping system. Since the entire data will be maintained in digital format through blocks. It will also be highly secure and tamper-free. From settlement to present and in future also, records will be organized online and can be updated from time to time. Any record of any year can be saved in seconds with a click of the mouse can be extracted. Blockchain technology will prove to be effective in reducing other problems related to revenue and land records like illegal occupation, encroachment, border dispute, etc. Land use details etc. Blockchain technology also provides many facilities to the general public, such as in land disputes.

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