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# **Land Documentation and Registry system using Blockchain technology**

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Prepared by

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# Acknowledgment

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## 1. ABSTRACT

Although the traditional registry systems are self-sufficient to an extent for accurate and secure Land Documentation and Registry, we often see certain inefficiencies, errors, and fraud in these methods which leads to delays and higher costs in the land transaction process. Hence a solution for this is the use of blockchain technology that can improve the accuracy, transparency as well as security of Land Documentation and Registry systems. In this project, we have used the concept of Blockchain and in that we have used Decentralized ledger so that no single entity controls the information on the ledger as well as we have used the smart contracts that runs on a Blockchain network and will be stored on every node these smart contracts basically automates the process of verifying and executing the contract.

The proposed system will enable secure and transparent land transactions by facilitating smart contract-based agreements between buyers and sellers. This will streamline the land transaction process and reduce the need for intermediaries, such as lawyers and brokers, thereby reducing transaction costs and improving efficiency.

## 2. INTRODUCTION

Traditional registry systems often lack transparency, making it difficult to verify the authenticity and integrity of records. The traditional registry offices make records of all the transactions based on the proofs submitted by buyers and sellers. It's difficult for them to verify the actual transactions. The whole process of the land registry system through paperwork is lengthy, it requires physical visits at each stage of registration resulting in a waste of money and time. The updation of records in the current registry system takes several weeks or even months in some cases, which leads to land double spending issues i.e. A person can sell the land to multiple parties.

The middleman is another big issue in traditional registry systems, they are the ones who charge a good amount to smoothen this complex registry process. It has been seen in many cases that these middlemen have sold the land with fake documents[1].

Most traditional registry systems rely on a centralized database, which makes them vulnerable to hacking, tampering, and data breaches. This is where blockchain technology comes into play. The decentralized nature of blockchain makes it more secure[2]. In a decentralized system, the data gets stored in different nodes rather than storing it in a central place which makes it difficult for a person to corrupt the information. It becomes challenging for hackers to steal data as it requires breaching multiple nodes to access the data.

Blockchain technology uses cryptographic algorithms for securing data which makes it possible to create a tamper-proof record of transactions and land ownership[2]. The records can be verified by anyone in the network and it will help in increasing confidence in land ownership. Since the people would be able to verify ownership easily, they don't require any middleman to do any of this for them. Our project aims to use blockchain technology to solve these problems faced by people during the land registry process.

### 2.1 Purpose of the Project

- The purpose of the Land Documentation and Registry system using Blockchain technology is to provide a secure and transparent way to store land ownership records and transactions. By using blockchain technology, land registry systems can be made more efficient, secure and cost-effective.
- Traditionally, land registration and documentation processes have been time-consuming, costly and are prone to errors, fraud and disputes. By leveraging blockchain technology, the Land Documentation and Registry system can provide a more reliable and efficient way to manage land ownership records, making it easier for landowners, government officials to access and update land ownership information.

### 2.2 Target Beneficiary

The target beneficiaries of the Land Documentation and Registry system using Blockchain technology projects are landowners, buyers, sellers and government agencies involved in the process of land registration & documentation.

## 2.3 Project Scope

The simplest implementation of a blockchain-based land registry could enable the ownership documents to be recorded and assigned to the owner's user account. The project scope of the Land Documentation and Registry system using Blockchain technology is to provide a secure and transparent way to store land ownership records and transactions<sup>1</sup>. By using blockchain technology, land registry systems can be made more efficient, secure, and cost-effective.

## 2.4 References

- [1] J. Vos, "Blockchain-based land registry: panacea illusion or something in between?," IPRA/CINDER congress, Dubai, 2016.
- [2] R. Benbunan-Fich, A. Castellanos, "Digitization of Land Records: From Paper to Blockchain," Thirty Ninth International Conference on Information Systems, 2018
- [3] Kshetri, N. (2017). Blockchain-based secure and transparent land registry. *Government Information Quarterly*, 34(4), 669-676.
- [4] S, Krishnapriya & Sarath, Greeshma. (2020). Securing Land Registration using Blockchain. *Procedia Computer Science*. 171. 1708-1715. 10.1016/j.procs.2020.04.183.
- [5] M. Nandi, R. K. Bhattacharjee, A. Jha and F. A. Barbhuiya, "A secured land registration framework on Blockchain," 2020 Third ISEA Conference on Security and Privacy (ISEA-ISAP), Guwahati, India, 2020, pp. 130-138, doi: 10.1109/ISEAISAP49340.2020.235011
- [6] Blockchain-based framework for secure and reliable land registry system Article in TELKOMNIKA (Telecommunication Computing Electronics and Control) · October 2020

## 3. LITERATURE REVIEW

The traditional land registration system has been in use for centuries, but it has always been plagued by issues such as fraud, inaccuracies, and a lack of transparency. These problems have resulted in inefficiencies and delays in the transaction process of the property, causing frustration for those involved. Blockchain technology provides a clear solution to these problems by providing a decentralized, secure, and transparent ledger for recording and managing all the information related to land.

One of the major benefits of using blockchain for land registration is increased security and better accuracy. The decentralized nature of blockchain means that there is no central authority or single point of failure, which reduces the risk of fraud or data tampering. Each transaction is validated by multiple nodes, and once recorded on the blockchain, it is

immutable, meaning that it cannot be altered or deleted. This enhances the accuracy and integrity of land records, reducing the potential for disputes and legal challenges.

Another significant benefit of using blockchain for land registration is the transparency it provides. The transparent nature of blockchain means that all stakeholders can see the same information, ensuring that there is no information asymmetry. The information on the blockchain is available to all, and each participant has access to the same information. This transparency promotes accountability and trust, which is essential for a secure and efficient land registration system.

However, there are several challenges in the implementation of this technology. One challenge is the need for legal frameworks that support the use of blockchain technology for land registry purposes. Existing land registry laws and regulations may not be sufficient to address the unique features of blockchain technology, such as smart contracts and decentralized control. Governments and legal authorities need to adapt their laws and regulations to accommodate blockchain technology to ensure the legal validity of blockchain-based land records.

Another challenge might be the resistance from users who are used to traditional land registry systems. There may be concerns about the reliability and security of blockchain technology, and some users may be doubtful of the new technology. Education and awareness campaigns will be essential to build trust in the technology and promote its adoption.

In conclusion, blockchain technology has the potential to transform land documentation and registry systems by providing increased security, accuracy, and transparency. However, there are several challenges in the implementation of this technology that need to be addressed. With proper legal frameworks and education, blockchain technology can revolutionize land registration systems, making them more efficient and secure.

#### 4. PROBLEM STATEMENT

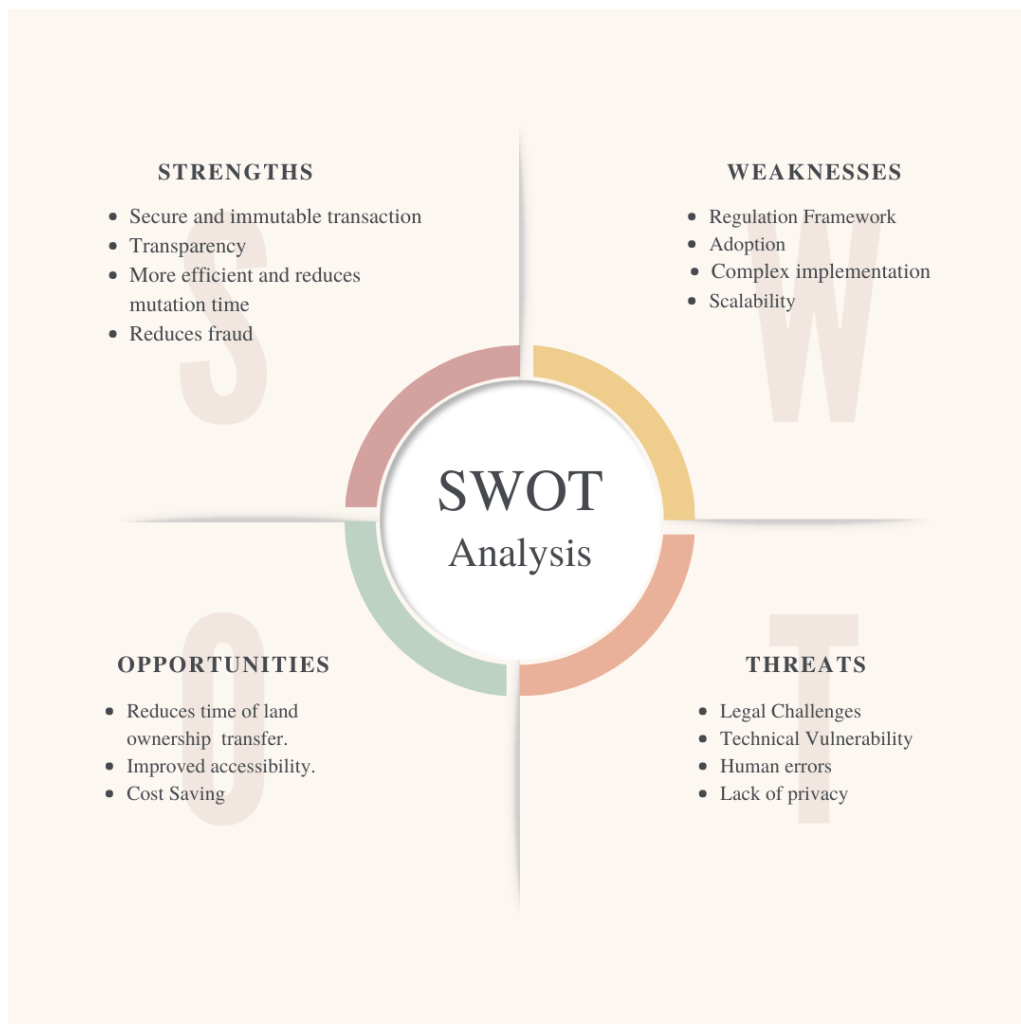
Although the traditional registry systems are self-sufficient to an extent for accurate and secure Land Documentation and Registry, we often see certain inefficiencies, errors, and fraud in these methods which leads to delays and higher costs in the land transaction process. Hence a solution for this is the use of blockchain technology that can improve the accuracy, transparency as well as security of Land Documentation and Registry systems.

#### 5. PROJECT OBJECTIVE

- To explore the benefits of using blockchain technology for Land Documentation and Registry systems.

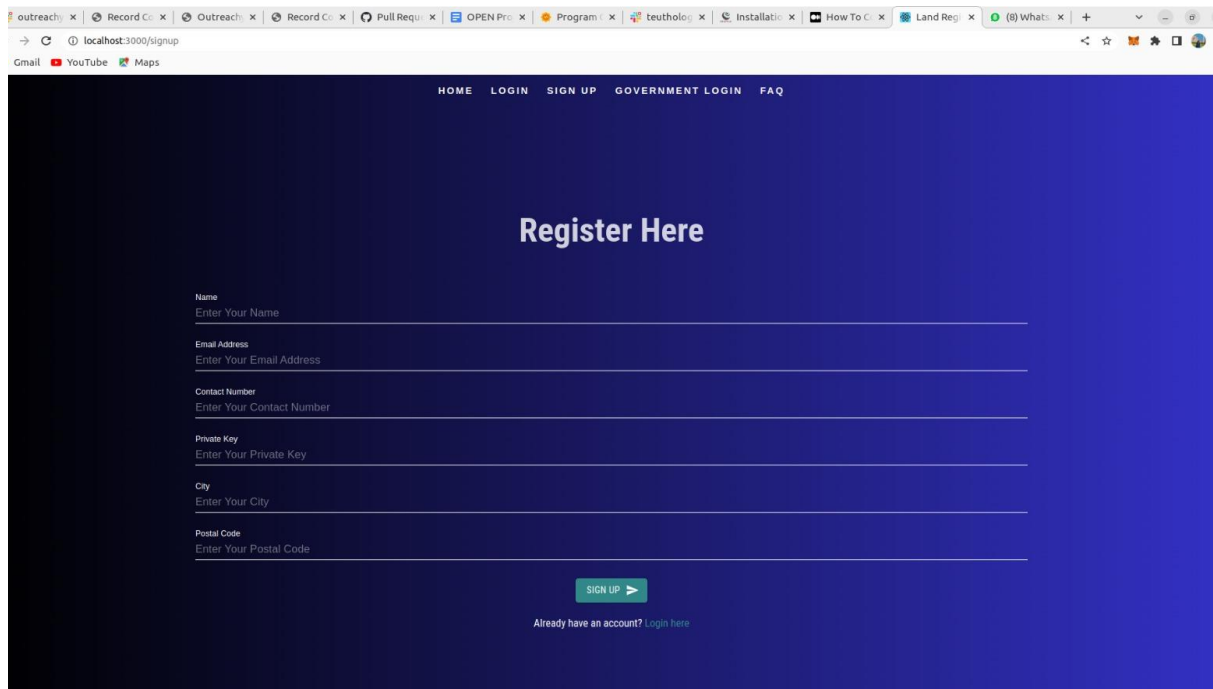
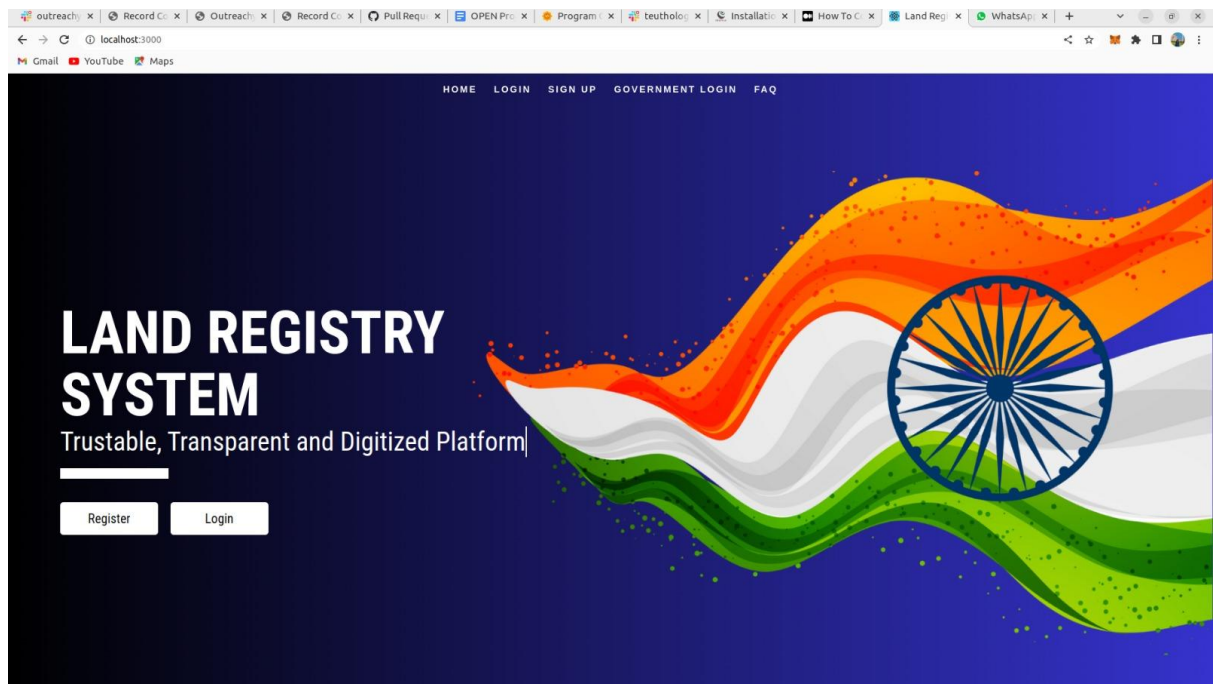
- To create more efficient, secure, and transparent Land Documentation and Registry systems.
- To overcome the inefficiencies, and errors and reduce the chances of fraud in the traditional registry systems.
- To integrate this system with existing land registration systems.
- To design a user-friendly interface such that the system is accessible to all stakeholders such as landowners, buyer and government officials.

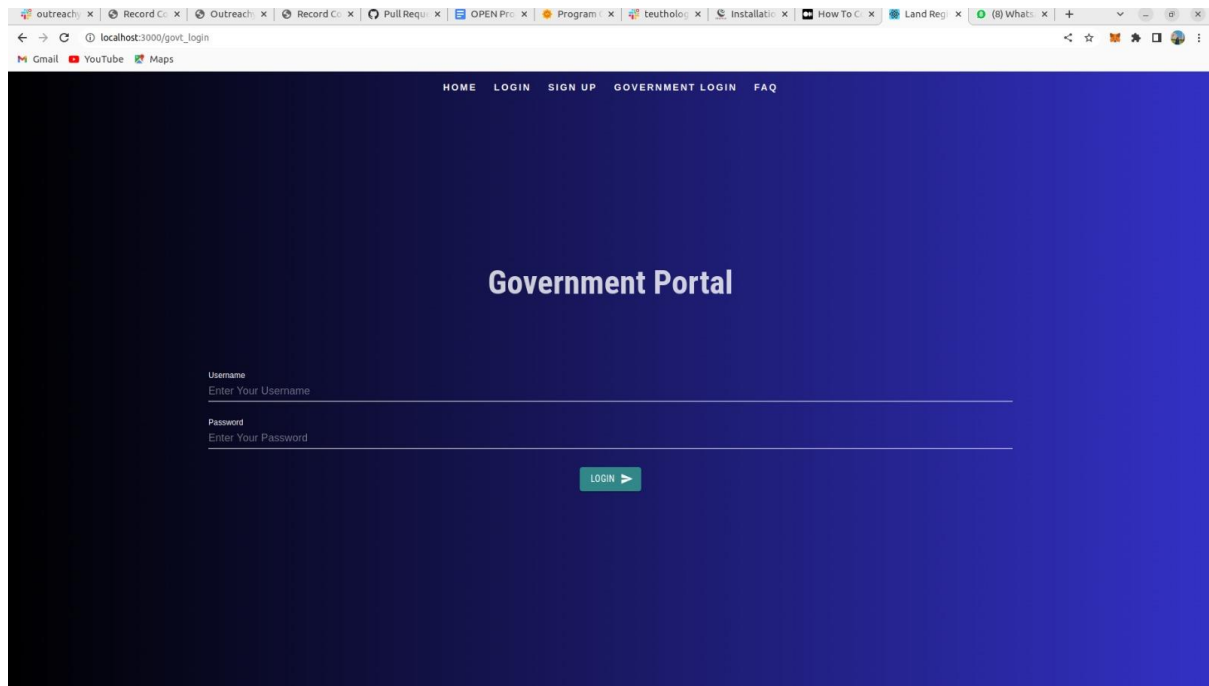
## 6. SWOT ANALYSIS





## 7. RESULT





## 8. NON-FUNCTIONAL REQUIREMENTS

The following are the four basic requirements needed:

- Basic system requirements
- Meta mask extension
- Latest version of Java
- Any IDE for running the code
- Necessary extensions in the IDE (if required)
- Git for version control

## REFERENCES

- [1] J. Vos, "Blockchain-based land registry: panacea illusion or something in between?," IPRA/CINDER congress, Dubai, 2016.
- [2] R. Benbunan-Fich, A. Castellanos, "Digitization of Land Records: From Paper to Blockchain," Thirty Ninth International Conference on Information Systems, 2018
- [3] Kshetri, N. (2017). Blockchain-based secure and transparent land registry. *Government Information Quarterly*, 34(4), 669-676.
- [4] S, Krishnapriya & Sarath, Greeshma. (2020). Securing Land Registration using Blockchain. *Procedia Computer Science*. 171. 1708-1715. 10.1016/j.procs.2020.04.183.
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