

Blockchain-Powered Land Ownership Management System

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Abstract: *The project involves using Block chain technology and non-fungible tokens (NFTs) to manage assets such as residential, commercial, and agricultural lands. Traditional methods of tracking ownership of these assets require long and complex processes, including the need to obtain title deeds from government offices. The proposed system aims to simplify this process by providing a secure and verifiable way to represent ownership of assets through the use of NFTs and smart contracts on the Ethereum network. This system not only makes it easier to track ownership of assets, but also helps to ensure that assets are properly insured and that regular payments are made for insurance, taxes, and subscriptions like electricity, water, and natural gas. By using NFTs, the system can also represent rare and unique assets that cannot be replicated or replaced, which increases their value and collectability.*

Keywords: Blockchain; NFT; Land Registration; Decentralized; Immutable; ERC-721

I. INTRODUCTION

The proposed modifications to the traditional method aim to improve its security and efficiency by implementing blockchain- powered Land Ownership management using NFTs and smart contracts on the Ethereum network. NFTs offer a secure and reliable method of asset ownership that cannot be duplicated, increasing the value and appeal of the asset. In the case of selling an NFT-represented land, ownership can be transferred to the buyer and recorded on the blockchain, with the buyer's public key or wallet address associated with the NFT and the land. Additionally, a smart contract can automate the transfer of ownership records and payments to the new owner. Furthermore, a blockchain-based digital identity system can be implemented for portal login, allowing users to create a unique identifier on the blockchain and authenticate themselves using various methods, such as a private key, password, or biometric identifier. This system offers high security and privacy, ensuring that user information is under their control and difficult for hackers to access without authorization.

II. BLOCKCHAIN TECHNOLOGY

Blockchain is a digital ledger technology that uses advanced cryptographic techniques to create a tamper-resistant and immutable record of transactions. This technology allows for secure and transparent transactions without the need for intermediaries, such as banks, governments, or other trusted third parties. Instead, the blockchain is maintained by a network of nodes, each independently verifying the transactions on the network. When a transaction is made on the blockchain, it is broadcast to the network of nodes for validation. Each node on the network independently verifies the transaction by checking its validity against a set of predetermined rules, depending on the specific consensus mechanism being used. Once a transaction is validated by a majority of the nodes, it is added to a block and recorded on the blockchain. The blocks in the blockchain are linked together using cryptographic hashes, creating an unbreakable chain of transactions that is distributed across the network. Each block contains a reference to the previous block in the chain, making it difficult for any single party to tamper with the data stored on the network. If someone tries to alter a block, the hash of that block changes, which in turn changes the hashes of all subsequent blocks in the chain, making the tampering evident. The decentralized nature of blockchain makes it highly secure and resistant to fraud, as there is no single point of failure or control. It also provides transparency, as anyone on the network can see

the entire transaction history. This makes it a powerful tool for promoting trust and accountability in many different industries, from finance to supply chain management to voting systems.

III. NON-FUNGIBLE TOKENS

Non-fungible tokens (NFTs) are a type of cryptocurrency that represents a unique digital asset, which makes them different from other tokens that are interchangeable and hold the same value. Each NFT is a unique digital asset that is verifiable, transferable, and has a clear ownership history. The first standard for NFTs was developed on the Ethereum blockchain, called the ERC-721. ERC-721 is a free and open-source standard that provides an interface for smart contracts to manage NFTs. Each ERC-721 token is unique and has its own set of properties, including a different Token ID that distinguishes it from other tokens. The ERC-721 tokens also include a list of approved addresses, which determines who has the authority to transfer or manage the tokens. The transfer function allows the tokens to be transferred from one owner to another in a secure and verifiable way. The ERC-721 standard has made it easier for developers to create and manage NFTs on the Ethereum blockchain. It provides a set of guidelines and functions that ensure the tokens are unique, verifiable, and secure. The standard has been widely adopted in the NFT community and has helped to establish Ethereum as the leading blockchain platform for NFTs.

Table I. Comparing NFT standards

NFT Standards	Support FTs	Support NFTs	Support Batch Transferring	Support Operator	Fractionalized NFTs
ERC-721	No	Yes	No	Yes	No
ERC-1155	Yes	Yes	Yes	Yes	No
dGoods	Yes	Yes	Yes	No	No
Algorand	Yes	Yes	Yes	Yes	Yes
Tezos	Yes	Yes	Yes	Yes	Yes
Flow	Yes	Yes	Yes	Yes	No

IV. EXISTING SYSTEM

The traditional asset registration process involved a manual process of identifying the type of asset, determining the appropriate agency or organization, gathering necessary documentation, submitting it with fees, waiting for the process to be completed and keeping track of the asset's ownership. This process was often time-consuming and cumbersome. In some cases, the process of registering assets in old days was also prone to errors and inconsistencies, as it relied on manual record-keeping and the interpretation of handwritten documents. This can lead to delays in the transfer of ownership and disputes over land title. The lack of standardization in land registration system across different countries can create difficulties in verifying land ownership across the borders.

V. PROPOSED SYSTEM

The proposed system for land registration using blockchain and NFTs offers a more secure and efficient way to record and verify land ownership. The system uses a decentralized blockchain network, which makes it more transparent and accountable, eliminating the need for intermediaries and reducing the potential for errors or fraud. The proposed system uses digital records for land ownership, which are stored on the blockchain as NFTs. Each NFT represents a unique and irreplaceable asset, making it ideal for recording land ownership. By using NFTs, the digital records stored on the blockchain are more secure and easier to verify than paper-based records, reducing the potential for disputes over land ownership. The proposed system also has the potential to revolutionize how land ownership is recorded and verified.

VI. CONCLUSION

The use of block chain technology and NFTs for land registration provides a secure, transparent, and efficient method of transferring land ownership. The decentralized nature of the block chain makes it difficult for any single party to

manipulate the data, providing a tamper-proof system for recording land ownership. The use of NFTs for land registration can reduce the costs associated with traditional land registration systems, making it an ideal solution for governments and individuals worldwide.

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