

Blockchain based Land Registry Management System

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Abstract

Land registry management involves storing and managing data related to land ownership transfers, typically using centralized databases maintained by government agencies. The conventional system faces issues such as inefficiency, inaccuracies, and susceptibility to fraud. Blockchain technology offers a transformative solution with its immutable, transparent, and decentralized nature. The proposed system uses non-fungible tokens (NFTs) to represent land assets, providing unique and irreplaceable digital representations for ownership transfer. Integrating NFTs into the land registry system enhances security and efficiency, addressing the challenges of traditional land registry administration.

Technology Used

- Javascript(to develop UI)
- Metamask(cryptocurrency wallet and gateway to blockchain applications)
- Ethereum (blockchain platform for creation of dapps)
- Hardhat (development environment for Ethereum to compile, deploy and test smart contracts)
- Ipfs (decentralised database)
- Solidity (to write smart contracts)

Challenges in the existing land registry process

- The Involvement of middlemen and brokers
- The increasing number of fraud cases
- Time Delays
- Human error/intervention

Why is Blockchain Land Registry Platform a right solution?

- Accelerating the Process
- Reducing Fraud Cases
- Bringing Transparency using Smart Contracts

Input and Output

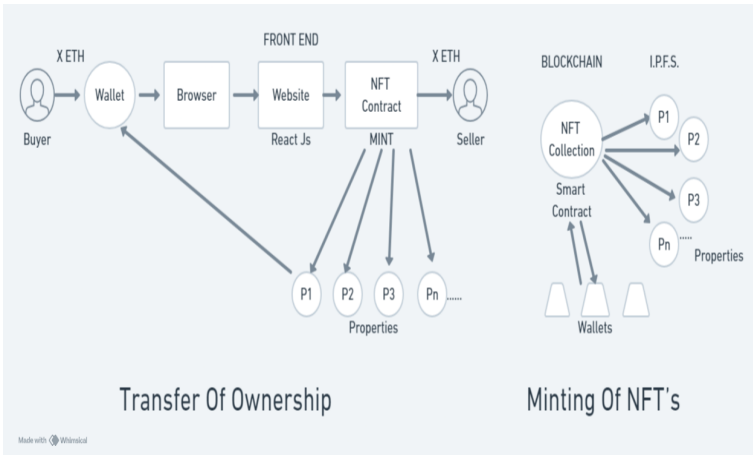
Input -

- Metadata related to land
- Current owner
- Pricing Details
- Request to buy a land

Output -

- Successfully minting an NFT of the property.
- Successful transfer of ownership of land requested.


Architecture Diagram



Property Registration

The screenshot displays a web browser window with the address bar showing `localhost:3000/register`. The browser has a single tab titled 'Milow'. The website's header features navigation links 'Register', 'Buy', and 'Sell', a logo for 'PropAcre' with a magnifying glass icon, and a 'Connect' button. The main content area is titled 'Store to IPFS' with the subtitle '(Add Property)'. Below this, there are eight input fields for property details: Name, Address, Description, Image URL, ID, Purchase Price, Type of Residence, and Bed Rooms. The Windows taskbar at the bottom shows the system clock as 20:25 on 02-06-2024, along with various system icons and application shortcuts.

Register Buy Sell

 **PropAcre**

Connect

Store to IPFS
(Add Property)

Name:

Address:

Description:

Image URL:

ID:

Purchase Price:

Type of Residence:

Bed Rooms:

33°C
Haze

Search

ENG
IN

20:25
02-06-2024


Available Properties

Milkow


localhost:3000

YouTube Maps News Gmail


Available Land




67 ETH
3 bds | 3 ba | 456 sqft
saint maria




45 ETH
34 bds | 56 ba | 67 sqft
Bilhaur



899 ETH
3 bds | 3 ba | 456 sqft
kanpur



789 ETH
3 bds | 3 ba | 456 sqft
prayag



789 ETH
3 bds | 3 ba | 456 sqft
saint maria


1 of 4
requires writing to be acknowledged

Hardhat Node


Buyer → One717...F0512

http://localhost:3000

One717...F0512 : DEPOSIT EARNST

 5 ETH
\$19,020.75

DETAILS HEX

Estimated fee  \$0.11

0.00002859 ETH

Max fee: 0.00002859 ETH

Total

\$19,020.86

5.00002859 ETH

Amount + gas fee Max amount: 5.00002859 ETH

Reject Confirm

39°C
Haze

Search

ENG
IN

20:31
02-06-2024


Request to Buy Property

Milow

localhost:3000

YouTube Maps News Gmail

Available Land



123klm

3 bds | 3 ba | 456 sqft
prayag

789 ETH

Buy

Contact agent

Overview

lamin

Facts and features

- Purchase Price : 789
- Type of Residence : none

3 bds | 3 ba | 456 sqft
prayag

3 bds | 3 ba | 456 sqft
saint maria

MetaMask

Hardhat Node

Bayer

One7117...FD...

https://localhost:3000

One7117...FD012 : DEPOSIT EARNED

4 ETH

\$15,388.32

DETAILS

HEX

Estimated fee

0.00002709 ETH

Max fee: 0.00002709 ETH

Total

4.00002709 ETH

Amount + gas fee Max amount: 4.00002709 ETH

Reject

Confirm

37°C
Haze

Search

ENG
IN

20:46
02-06-2024

Approval from Inspector

The screenshot displays a web browser window with the address bar showing 'localhost:3000'. The page content includes a header 'Available Land' and a main listing for a property named 'plioik'. The listing details are: 3 bds | 3 ba | 456 sqft, located in saint maria, with a price of 789 ETH. There are two buttons: 'Approve Inspection' (highlighted in blue) and 'Contact agent'. Below this is an 'Overview' section with the text 'xyz' and a 'Facts and features' section listing 'Purchase Price : 789' and 'Type of Residence : mansion'. At the bottom, there are two smaller property cards, one for 'prayer' and another for 'saint maria'.

Overlaid on the right side of the browser window is a MetaMask transaction confirmation window. It shows the transaction URL 'https://localhost:3000', the transaction ID '0xe7102_F0512', and the status 'UPDATE INSPECTION STATUS'. The estimated fee is \$0.19 (0.00004975 ETH) with a max fee of 0.00004975 ETH. The total amount is \$0.19 (0.00004975 ETH). At the bottom of the MetaMask window are 'Reject' and 'Confirm' buttons.

Windows taskbar at the bottom shows the system clock as 20:38 on 02-06-2024, with the temperature at 39°C and weather as Haze.

Approval from Seller

The screenshot shows a web browser window with the address bar displaying 'localhost:3000'. The page content includes a header 'Available Land', a main listing for 'plioik' with details '3 bds | 3 ba | 456 sqft | saint maria' and a price of '789 ETH'. There are two buttons: 'Approve & Sell' and 'Contact agent'. Below this is an 'Overview' section with the text 'xyz' and a 'Facts and features' section with two bullet points: 'Purchase Price : 789' and 'Type of Residence : mansion'. A MetaMask transaction confirmation overlay is visible on the right, showing the transaction '0xe7117...F0512 : APPROVE SALE' for \$0.00. The overlay also displays the estimated fee of 0.00004616 ETH and the total amount of 0.00004616 ETH. The bottom of the screen shows a Windows taskbar with the date '02-06-2024' and time '20:42'.

Available Land

plioik
3 bds | 3 ba | 456 sqft
saint maria
789 ETH
Approve & Sell Contact agent

Overview
xyz

Facts and features

- Purchase Price : 789
- Type of Residence : mansion

MetaMask

Hardhat Node

Seller → 0xe7117...F0...

https://localhost:3000

0xe7117...F0512 : APPROVE SALE

\$0.00

DETAILS HEX

Estimated fee **0.00004616 ETH**
Max fee: 0.00004616 ETH

Total **\$0.18 0.00004616 ETH**
Amount + gas fee Max amount: 0.00004616 ETH

Reject Confirm


Successful ownership transfer

Milkow x +

localhost:3000

YouTube Maps News Gmail

Available Land



plioik
3 bds | 3 ba | 456 sqft
saint maria
789 ETH
Owned by 0xf39F...2266

Overview
xyz

Facts and features

- Purchase Price : 789
- Type of Residence : mansion
- Bed Rooms : 3

3 bds | 3 ba | 456 sqft
prayerg

3 bds | 3 ba | 456 sqft
saint maria

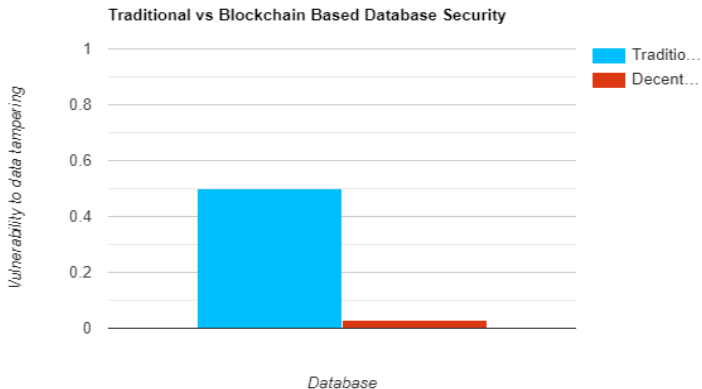
37°C Haze

Search

ENG IN

20:43 02-06-2024

Observation



Conclusion Of the Project

- Improved Transparency
- Efficient Land Transactions
- Reduced Fraud
- Accurate Land Records
- Ease of Access
- Cost Saving

Future Work

- Deployment on mainnet or a private network
- Ownership transfer feature for fractions of a property, enabling multiple owners for a single property.
- Side chaining for scalability.