RareProperties.IO Tech Overview

The general goal of this project is to build a marketplace, allowing users to buy and sell assets related to their real estate properties via the means of decentralized web technology. Each asset will be uniquely identified using a token abstraction, known as Non-Fungible Token (NFT). This will allow users to keep custody, track ownership and verify historical transactions using a public ledger - in this case, Ethereum.

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Core functionality:

- NFT Token Minting
- NFT Marketplace

Working Assumptions

- ERC-721 standard is used as the building block of the asset traceability system, relying on the secured and audited implementation by Open Zeppelin.

- Application users will have a Metamask wallet setup and knowledge on how to use it, manage their keys and addresses.

- Platform will give user ability to easily go through the process of creating a new ERC-721 token and recording this in the blockchain ledger.

- Each asset (NFT) might have extra information linked to it, such as an image or a video or other unlockable content. This data will be kept off-chain using the IPFS.

Smart Contract Strategy ERC-721 standard & Token Factory

The collection of smart contracts, interfaces and extensions will serve the following functionalities as described:

- Smart contracts will allow the process of minting. This means issuing a token for creating an asset representation. We should be able to set ownership of the asset to the chosen address.

- Smart contracts will allow ownership management of assets (tokens), meaning each asset will have an owner. When selling/buying, ownership of the asset will be transferred from one account to another.

● Smart contracts will allow putting an item for sale in one or many different forms (to define). The owner of an asset can put it up for sale supporting the 3 mainstream forms (fixed price, Dutch auction and English auction):

◦ Fixed price:a seller picks price, confirm the listing, and the item remains on sale until it's either purchased for the stipulated price or canceled by the seller.
◦ Dutch auction:a seller selects starting price, ending price,and an auction duration.Theseller starts the auction at a level above the expected demand, and the price declines over time.

◦ English auction: a seller starts an auction where buyers can place bids and highest bid becomes the buyer, when auction finishes.

Off-chain Metadata

● An additional API is needed for serving the metadata we want to include on the NFT. This data stays off-chain. Reference to the digital asset will be provided manually by the artist on the moment of minting NFT using IPFS standard. Ideally we want the platform to generate IPFS links without sending users to complete third party action.

● Metadata will be linked to each token identifier using a set TokenURI method on the smart contract, which will return the URL for the resource.

● The class for the Real Estate asset item can have multiple attributes, such as: { title: “...”, geo location:”...”, image:”...”, creation Date:”...”}. Users can create their own categories names.

Frontend Main Functionalities

The following functionalities must be accommodated by the frontend and UI/UX:

- Fetch assets: get assets, and for each asset, see details about attributes, balances, ownership, etc.

- Put the asset on sale: the owner can decide to put the asset on sale. This includes:
  - decide type of selling: fixed, Dutch, English
  - decide parameters depending on type of selling (starting price,ending price, auction duration etc.)

- Buy item: for fixed-price and Dutch auctions this is a direct action.

- Place bid: for English auction

- Fetch orders for an asset: get the open orders for that asset

- Order items assets (define parameters: new, most viewed, for sale, cheapest etc.)

- Filter assets (define parameters: new, most viewed, for sale, cheapest etc.) •…

Tech Stack. A summary of the most important technologies that will be used to build the described system and the role they'll play inside this project:

- Metamask: wallet integration for interacting with the Ethereum blockchain by a chrome extension

- **Hardhat:** the development framework for writing, compiling, migrating and deploying smart contracts

- **Ethers.js**: library for interacting with smart contracts and the Ethereum blockchain

- Open Zeppelin: packages providing implementation of standards which are already audited and secure

- IPFS: protocol for sharing data, in this case asset meta-data, in a distributed and peer-to-peer system

- Mocha/Chai: tooling for implementing unit testing of smart contracts

- Javascript/HTML/CSS: frontend development (+any dependency needed along the development process). **Next.js in Top of React.js.**

WORKFLOW OF THE NFT MARKETPLACE

Creator Flow

Users Flow

Platform - Flow with Features Admin Panel

NFT Token Development

ERC 721- It is a more sophisticated token and not mutually interchangeable with other tokens. Each token in ERC 721 is different and unique. Analyze the project and suggest the right tokenomics that include token supply, price, etc.

Smart Contracts

The Smartcontracts are algorithms that execute in our platform automatically, governing the whole ecosystem Smart contracts can be helpful in tracking the ownership of the Collectibles on the platform.

The Collectibles in the platform has different designs that will be stored in the smart contract. All details about the Collectibles (ERC 721 tokens) will be tracked by the smart contract on the platform.

Once the users initiate the transaction (ERC-20), the smart contract transfers the ownership of the assets (ERC-721) to the particular user.

Royalty- The royalty fee for the creators will be written on the smart contracts. For every sale, there will be a royalty fee transferred to the users.

Transaction History- When a asset is traded multiple times, the smart contracts stores the ownership details of the assets

The marketplace will build the percentage of ownership into every token minted as the transaction cost charge. Along with the creator of the token, the platform will maintain the ownership of the minted token.

Platform allows the creators to bundle tokens into several NFTs together. Platform allows the creators to upload the designs and media files.

Launchpad

Creator- Create a Collectible (Collectibles Token)

To create a collectible, users need to enter the following details:

- Type - Single/Multiple
- Upload Image
- Preview
- Choose Collection

- Choose Name
- Description
- Catchy Title
- Properties
- Enter IPFS Value
- Enable/Disable
- Put on Sale
- Unlock once purchased

Once they submit the above details, users need to confirm the app request in order to approve transactions from their wallets. The token details will be stored on the smart contracts.

Bids

Users will be able to place the bids for the tokens based on their interest. They will enter the details such as bid amount, wallet, etc.

These bids will be stored on the smart contracts and sent to the creator.

Sale

Based on the bids, creators can sell the tokens on the platform. Once the seller accepts the bid, the amount from the users' wallet will be transferred to the creator wallet.

The transactions and ownership details will be recorded on the blockchain.

Hold

Users who have purchased the NFT tokens can hold the same in their wallet.

Sell

Users can also sell these NFT tokens to other users by creating an offer on the marketplace. In the marketplace, users will be able to check the list of NFT tokens available for sale. Any user can buy/sell these tokens based on their preferences. All these transactions and ownership of the tokens will be recorded on the blockchain.

Marketplace

Connect Wallet

Before performing an action, users need to connect to a wallet from the list of available options on the platform (Metamask, etc)

Once the users select a particular wallet (Already logged in), it will prompt the users to enter the login credentials. They need to enter the email address/phone number and password. They will receive a six-digit code to confirm their account.

How it Works

Users will be able to check how the platform works on the platform.

Home

In the marketplace, users will be able to check the following:

List of Collectible(Collectible Designs) Image

Price, etc

Search

Users will be able to search for a particular creator, collectible, or collection by entering the keyword on the platform.

Explore

In this section, users will be able to check the overview of the following:

Top Sellers in Days

Hot Bids

Explore- Based on the category(Art, Index, Games, DEFI, etc)

Collectibles Design Details

Investors can check the list of Collectible designs with the following details:

- Name
- Overview
- Amount, etc

Filter

Users can filter the Collectible designs available on the platform by type, price, etc.

Select a Collectible

Users will be able to select a particular collectible and view the following details:

- Name
- Price
- Image
- Owner
- Creator

- Collection

- Service Fee

- Buy Now

- Bid, etc.

- Location
- Type of Media
- Type of Rights offered: exclusive/multiple

Share

Users will be able to share the collectible with their social media accounts such as Facebook, Twitter, etc

Buy Now

Users will be able to buy the collectible using their wallet balance on the marketplace.

Place a Bid

Users will be able to place a bid for the collectible by entering the amount on the platform.

Check Bids

Users will be able to check the list of bids from the users for the tokens on the platform.

Accept Bids

Creators will be able to accept the bids from the users based on the amount and preferences.
Activity

Users will be able to check the trading history with the following details: Event, Item, Unit price, quantity, From, To, and Date.

Rankings

Users will be able to check the list of NFT tokens (Collectible Designs) with the following details: Filters, volume, owners, assets, etc.

Other Options

Users will be able to check the following options:

- Purchase Now
- Place a Bid
- Report, etc.

FAQ

Users will be able to check the list of frequently asked questions on the platform.

Blogs

Users will be able to check the list of blogs posted on the platform.

Language

Users will be able to view and select their preferred languages on the platform.

Drop

Creators of the collectibles can set a drop period for the collectible to be sold on the platform. Once the drop period ends, the tokens can’t be sold on the platform.