ESCRYPTOW: THE DECENTRALIZED, ETHEREUM-BASED MARKETPLACE

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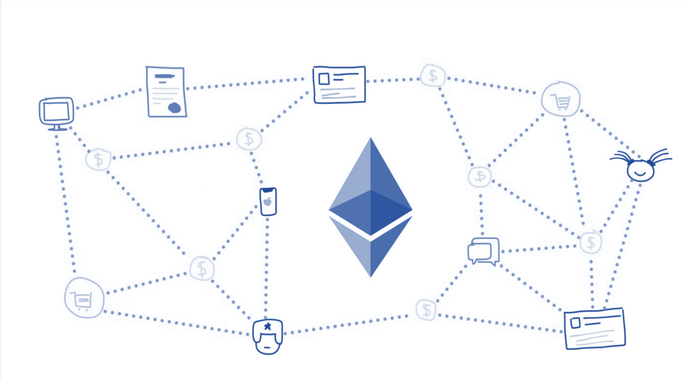
OVERVIEW

The online marketplace and escrow system show great potential to be incorporated with and benefit tremendously from emerging blockchain technology. In this project, we aim to creates a decentralized, blockchain-based online marketplace. The goal of the website is to provides secure online transaction and comfortable online shopping experiences for users while guaranteeing high degrees of user anonymity and autonomy.

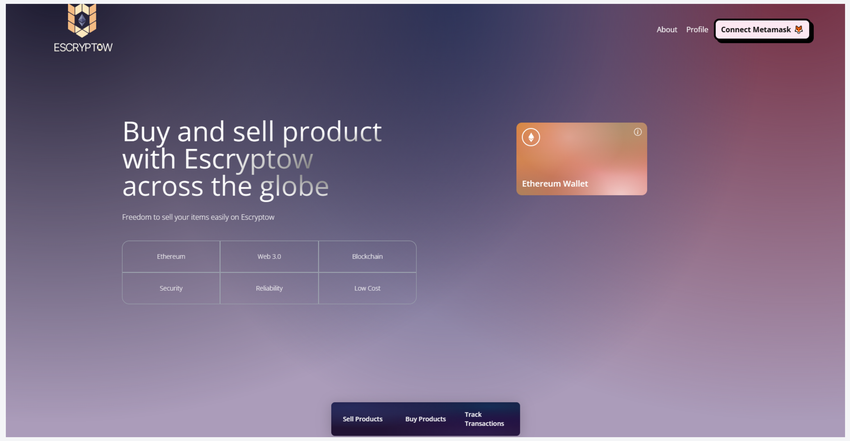
To create the escrow system and user-interactive platform, we developed smart contract based on Solidity to accommodate user - user transactions and established front-end website on Pinata, an interplanetary file system based node service provider. Together, user can navigate the autonomous marketplace as they would on a conventional shopping site while using cryptocurrency for product exchange

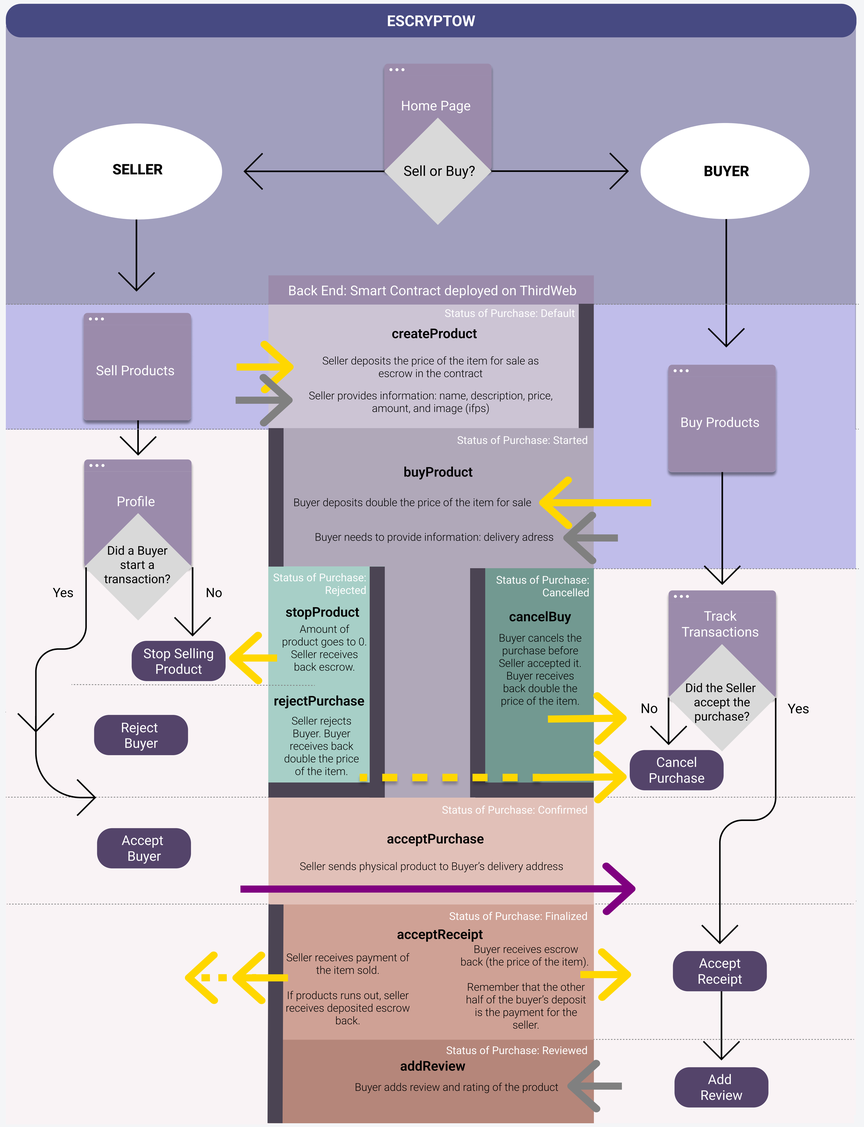


BLOCKCHAIN

Blockchain technology shows great potential to be deployed in escrow and online transactions systems primarily with their

- **Transparency** : The escrow system runs entirely based on user-viewable smart contracts and is essentially free from third party brokers. No service fees will be charged as by the corporations in conventional online shopping sites.
- **Information Integrity** : In Blockchain, stored data, like transaction records, are immutable and permanent on each node independently. The system is therefore technologically more resistant towards malicious deletions or unauthorized modifications.
- **User Anonymity** : Users on Escryptow are only required to sign-in through Metamask, a virtual wallet for cryptocurrencies. The trustless of the market highly guarantees privacies of users





METHOD

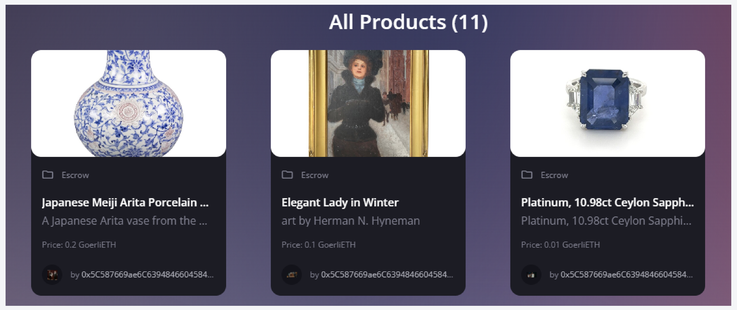
Smart Contract:

The objective of the smart contract was to provide advanced functionalities for the transaction system and multiple utility features for the website. We developed the contract through Solidity in Remix IDE and deployed the contract on based on Goerli Ethereum testnet. It was designed to enable buyers and sellers to interact through different actions, such as

- posting products for sale
- making deposits
- canceling transactions
- sending confirmations at each step.

Additionally, we also adapted some of the view functions based on feedback from the front end to ensure transparency for users.

Since we expect the escrow system to operate on a trust-less basis, we designed the smart contract to securely holds deposits from both parties until confirmation was acquired -- deposits are only released after the buyer receives the item, made all conditions of the contract are met, and updates the status (i.e. through acceptReceipt) .



Website:

We created the escrow website with user interfaces in hope of providing a convenient, intuitive way for users to interact with the smart contract. The front-end website is built based on JavaScript and relevant libraries and environment tools (e.g. React, Vite). For our customized web framework and user interface designs, we used TailwindCSS to achieve the various visual elements. Thirdweb SDK also supports how we can publish our contract & interact with it using react.

The deployment of the decentralized App framework of the client was accomplished using Hardhat. We also utilized an interplanetary file system (i.e. IPFS) for data storage and file sharing across the chain. A typical user on our website should be able to create, join current transactions, and track transactions to review the status of previous trades and take action accordingly.