

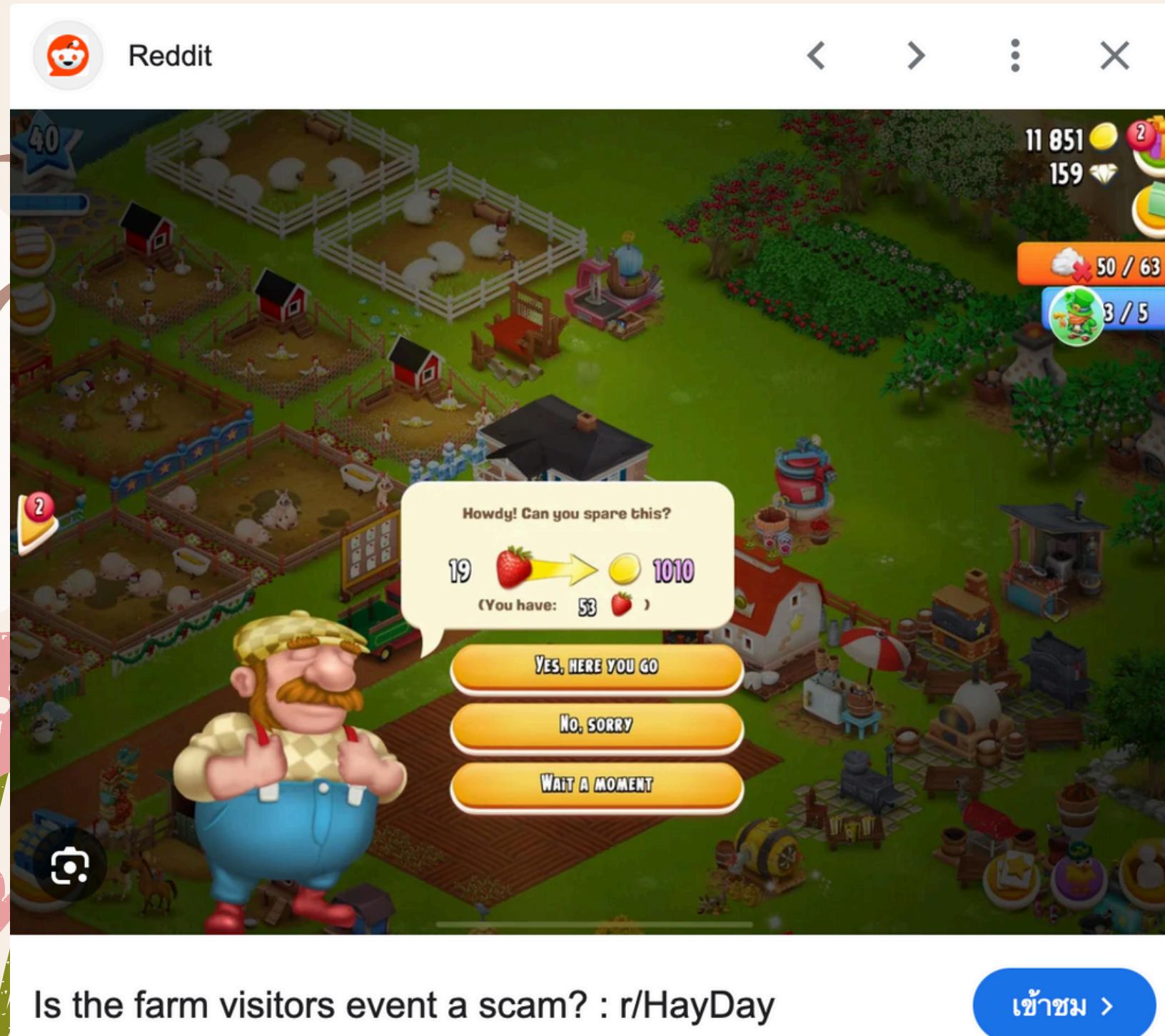


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Haychain

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Problems



Nowadays, **middlemen** often buy agricultural products from farmers at low prices and sell them at higher rates, allowing them to control the market. The involvement of multiple intermediaries makes it **difficult to track fair pricing** and product quality, creating a lack of trust in the supply chain.



solution

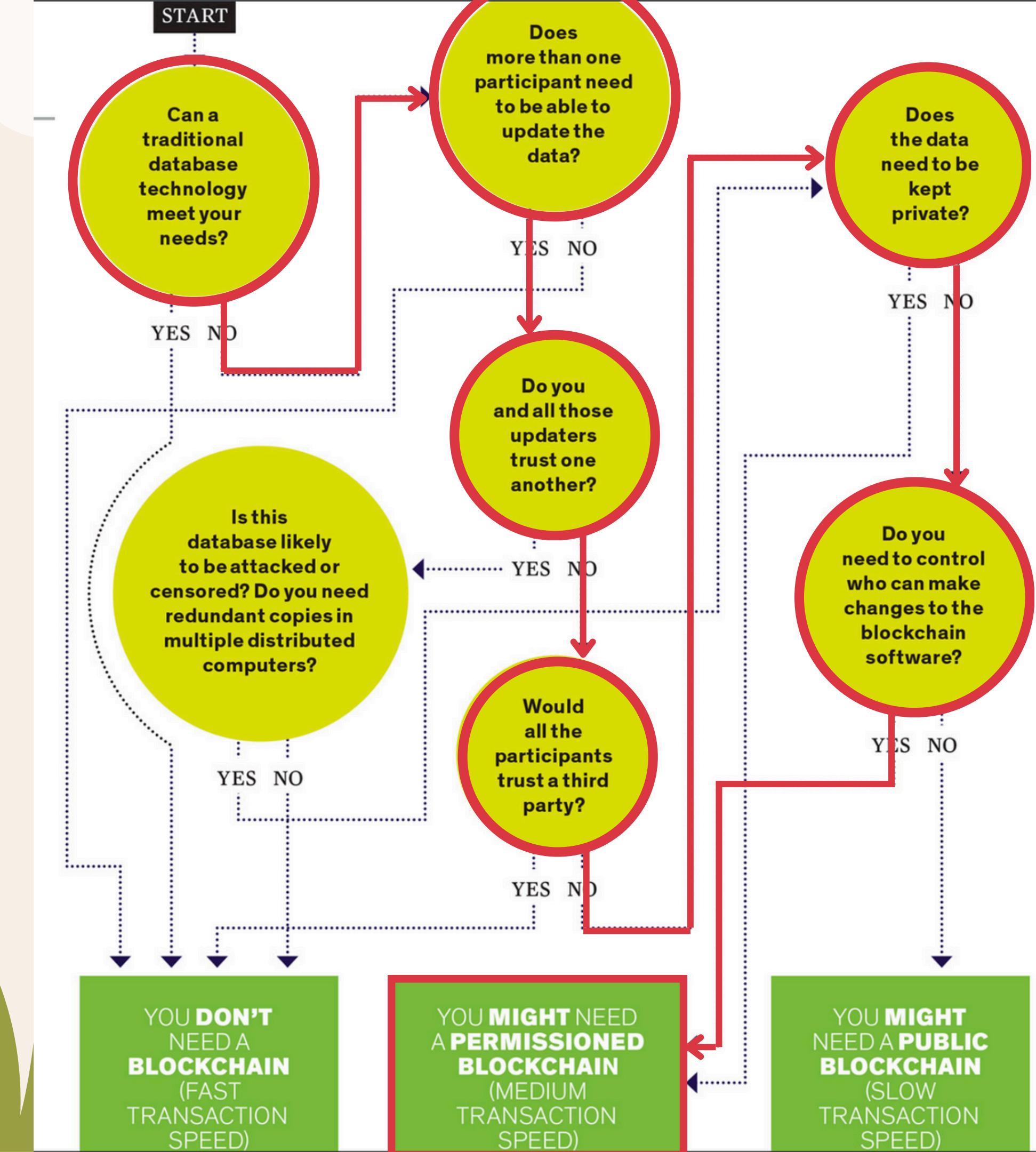
We act as a middleman but with enhanced transparency. Everyone in the network can track the real-time supply from every farm selling through us. The selling price is calculated based on actual supply data from all participating farms, ensuring a fair and transparent process for everyone involved.



Why Blockchain ?

As a farmer, I don't trust other farmers so using a blockchain can help us ensure that we are not getting screwed. Seeing all market prices is the key to prevent frauds.

ETH Chain



Working System



Update Price

(Current Price, Total Stock)



Buy Product

(Quantity, Average Buying Price)



Order Product

(Quantity, Average Selling Price)



Smart Contract

Incentive / Penalty

We use the ETH chain so the incentive and penalty are the same. You'll get money if you validate the block correctly and you'll lose money if validate wrong transactions.

Consensus

Proof of Stake (PoS)

Security

- If we write the smart contract badly, there could be vulnerabilities on many attacks such as reentrancy attack.
- There is 33% attack which might destroy the whole ETH chain too.

contracts

Farm Contract

- + payFeeAndMakeOffer
- + approveStockReceived
- + rejectStock
- + receiveMoney
- pay
- + clear

- + addBudget
- checkBudgetAvailable

Stock Contract

- + addStock
- + removeStock
- updatePrice
- + getStockAmount
- + getCurrentPrice

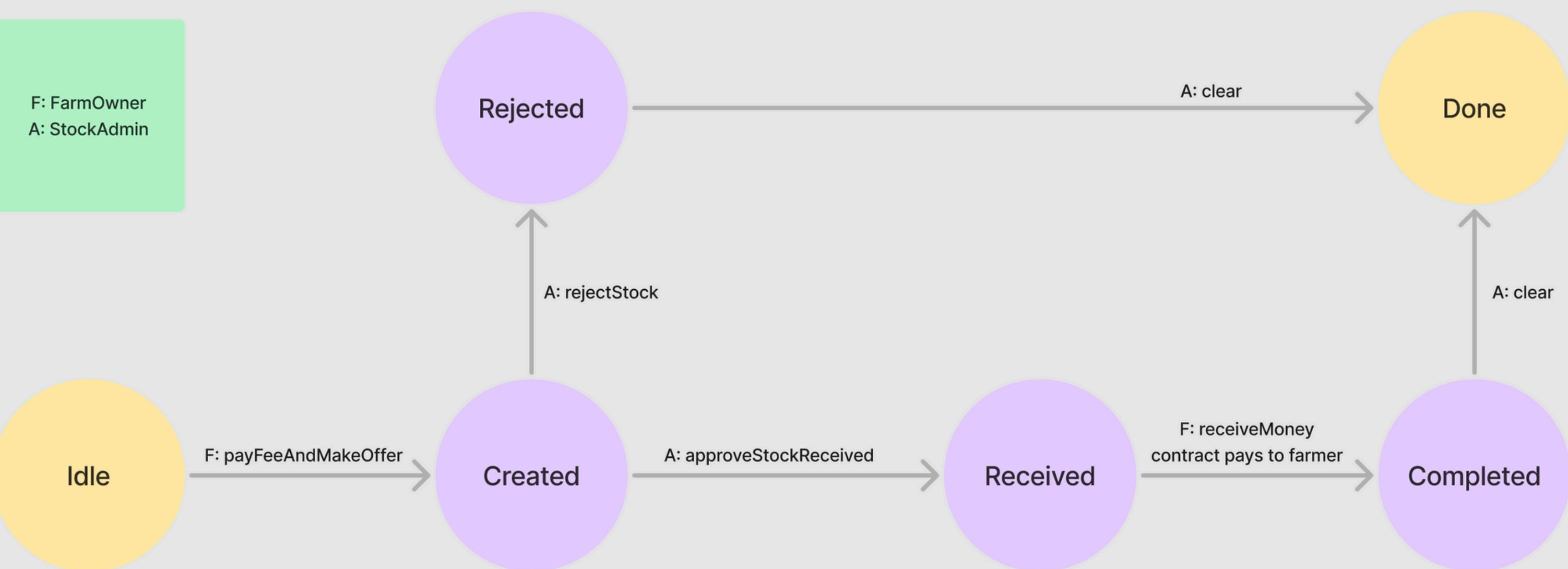
Customer Contract

- + makeOrder
- + cancelOrder
- + acceptOrder
- + deliver
- + received
- pay
- + clear

State Diagram

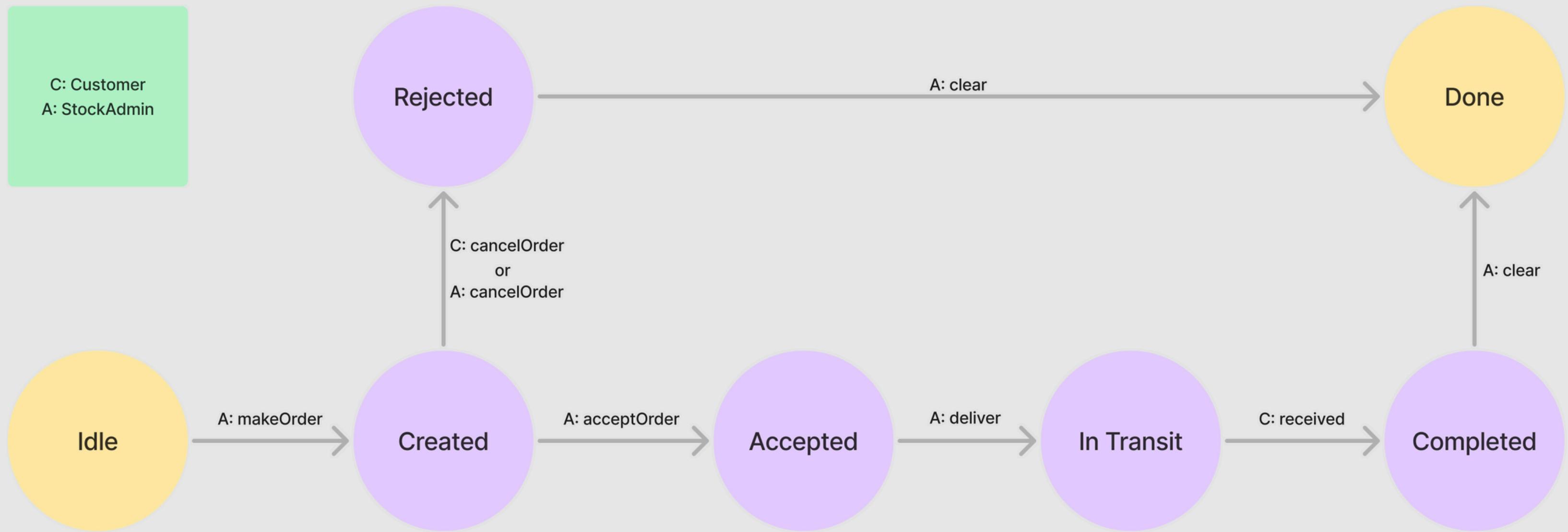
Note that admin need to add money to this contract as an investment
Fee is also collected even if the stock is rejected. This is for DoS penalty.

Farm Contract



State Diagram

Customer Contract



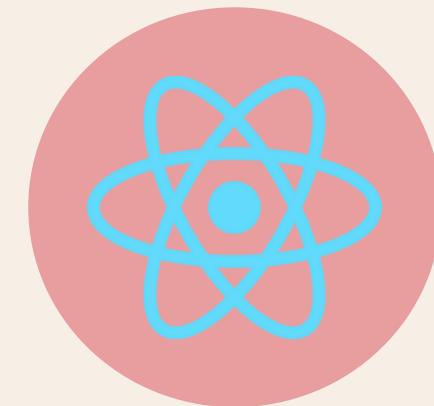
Update Price

```
function updateStockPrice(
    string memory _productName,
    uint256 _oldQuantity,
    uint256 _newQuantity
) private {
    bytes32 _productId = keccak256(abi.encodePacked(_productName));
    Stock storage stock = stocks[_productId];
    uint256 oldSellingPrice = stock.sellingPrice;
    uint256 oldBuyingPrice = stock.buyingPrice;

    if (_oldQuantity > _newQuantity) {
        stock.sellingPrice = oldSellingPrice + 1 * (_oldQuantity - _newQuantity);
        stock.buyingPrice = oldBuyingPrice + 1 * (_oldQuantity - _newQuantity);
    } else {
        uint256 priceAdjustment = 1 * (_newQuantity - _oldQuantity);
        stock.sellingPrice = stock.sellingPrice > priceAdjustment ? stock.sellingPrice - priceAdjustment : 1;
        stock.buyingPrice = stock.buyingPrice > priceAdjustment ? stock.buyingPrice - priceAdjustment : 1;
    }
}
```

Tech stack

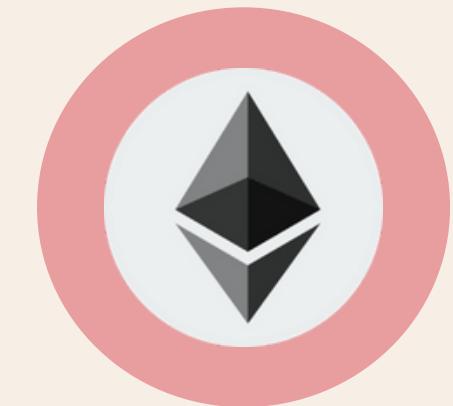
**Web
Application**



Metamask



**Ethereum
Smart
Contract**



Github Repository

link: <https://github.com/lammrteapot-learning/haychain-blockchain-platform>

The screenshot shows the GitHub repository page for 'haychain-blockchain-platform'. The repository is public and has 2 branches and 0 tags. The main branch is 1 commit ahead of the 'main' branch. The repository was last updated 1 hour ago by user 'Porsche-ths' with 58 commits. The commits are listed below:

Commit	Message	Time Ago
feat: update readme	e327dec · 1 hour ago	58 Commits
admin	decorate: hide market place	4 days ago
contracts	:fix stock quantity checking	5 days ago
frontend	frontend: change substring length	4 days ago
.gitignore	init: copy frontend	4 days ago
README.md	feat: update readme	1 hour ago

The README file contains the following content:

Welcome to HayChain Market Place!

HayChain is a blockchain-based web application designed for agriculture product processing. Key features include tracking agricultural products from individual farms and selling them at market prices. Additionally, HayChain facilitates faster automated payments, ensuring timely and secure transactions for farmers.

Usage and Deployments

The HayChain application is already deployed on an EC2 instance and can be accessed [here](#).

All smart contracts for the application are deployed on the Sepolia testnet. To interact with the application, you can obtain free SepoliaETH from any [Ethereum Sepolia Faucet](#) to fund your transactions.

Smart Contracts

DEMO





Thank you!