Agricultural IoT and Blockchain: A Tomato's Journey from the Field to Supply

Blockchain 5576: Final Pitch Presentation

Kylee Willis

Table of Contents

01

Problem Overview

Goal

My project is designed to monitor a farmer's use of chemicals on their crops. This is done via a blockchain, and can be added both manually and automatically via an IoT simulator.

Why?

- Food supply chains would find it easier to prove their food doesn't, for example, have pesticides.
  - Trustless
  - Transparent

- Integrate blockchain technology into agricultural IoT, ultimately answering:
  - How could blockchain be integrated into agricultural IoT?
  - How would agricultural IoT benefit from the use of blockchain technology?

Technology Stack

Backend:
- Hardhat
- Solidity
- Node.js (+npm)
- IoT device simulator

Frontend:
- Vue.js
- Web3.js

Screen Recording:
- Zoom

Wallet Integration:
- MetaMask

02

Key Features

Backend

- Start a blockchain/Node network
- Deploy Smart Contract
- Start the frontend
- Run IoT randomizer infinitely
- Can interact with Smart Contract

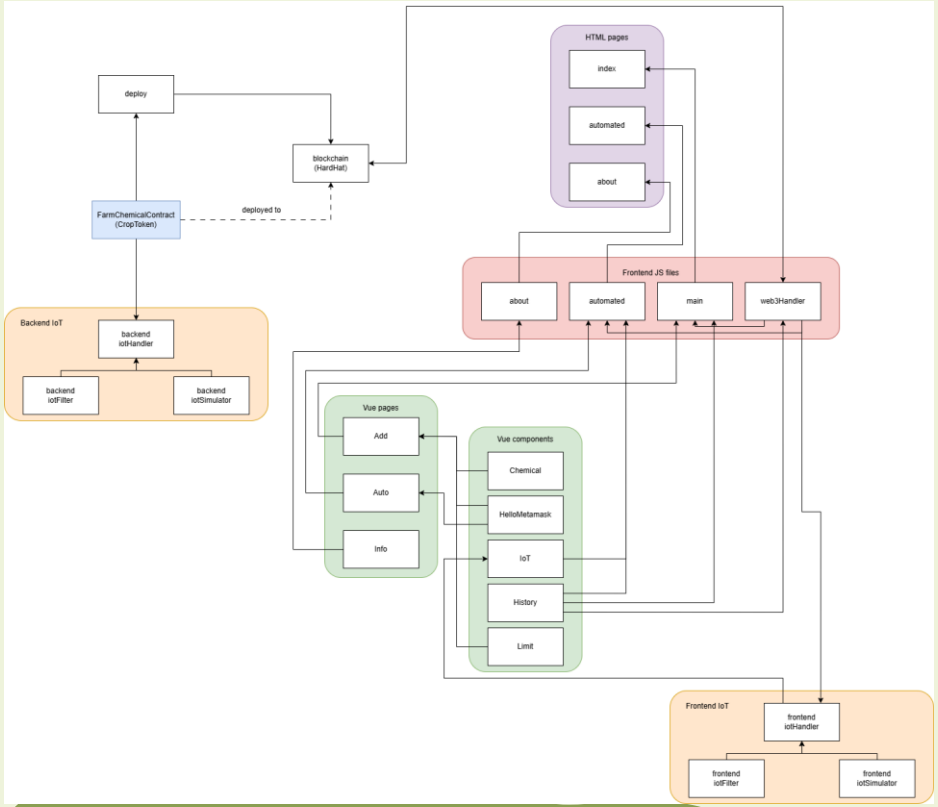
Frontend

- Connect via MetaMask
- View chemical spending limits
- Deployer can set chemical limits for accounts
- Manually add chemical usage to blockchain
- Automatically add chemical usage to blockchain
- View chemical history on the blockchain

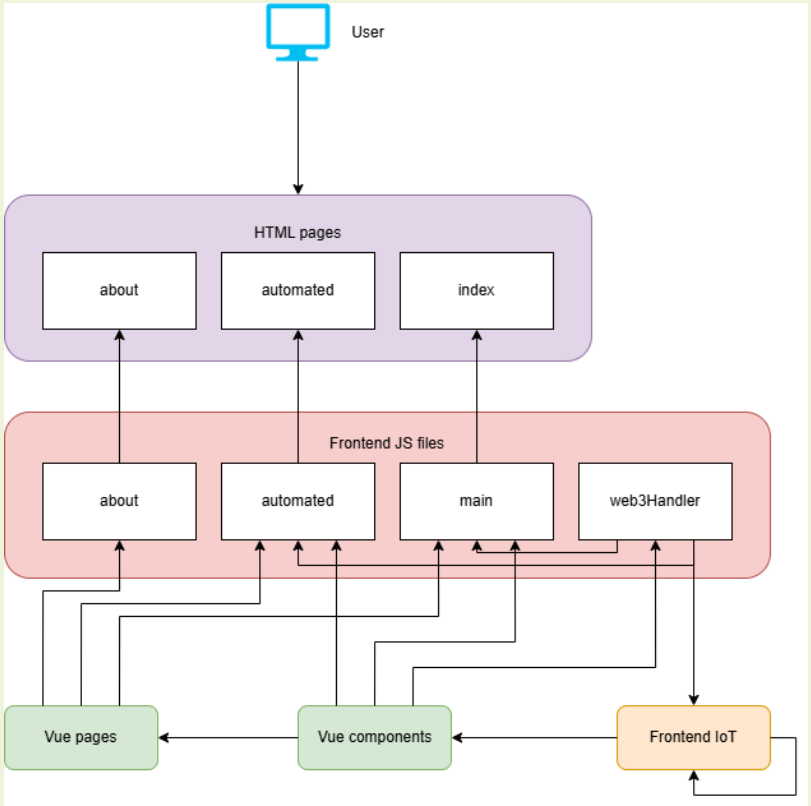
03

Technical Architecture

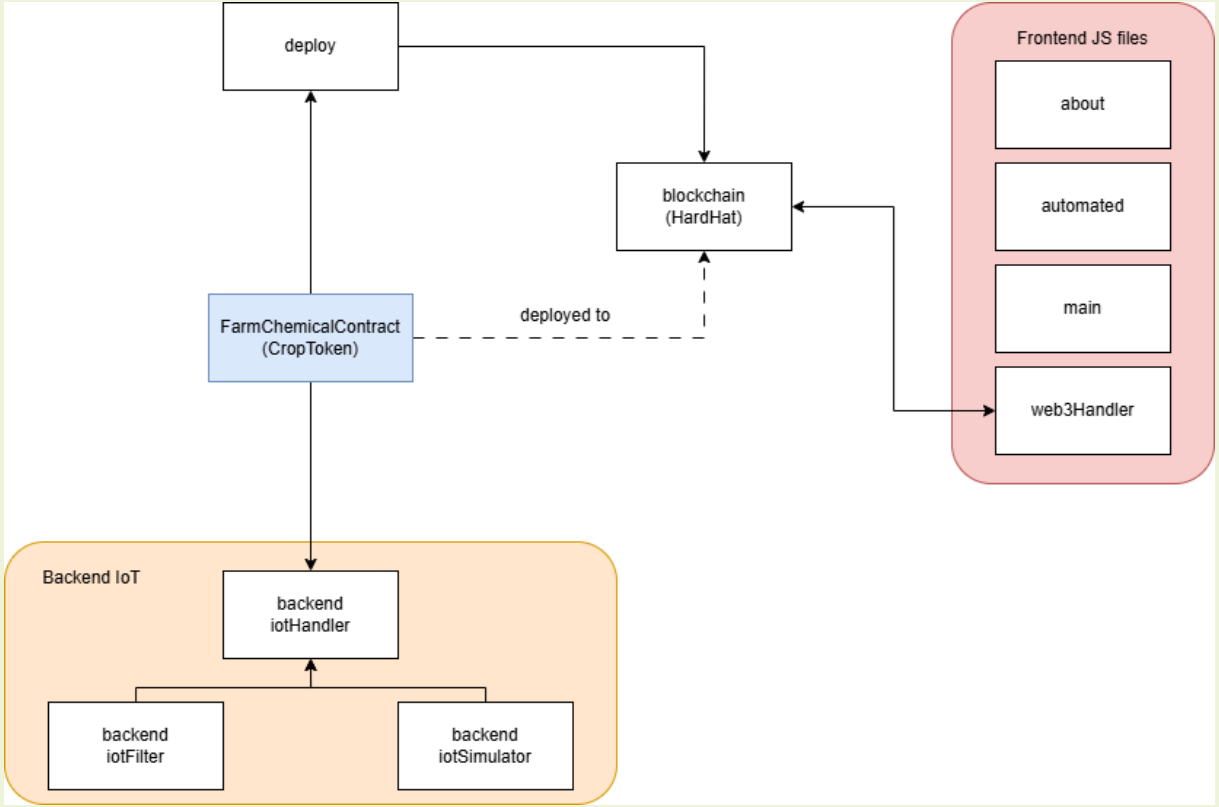
Overall architecture



Frontend Architecture



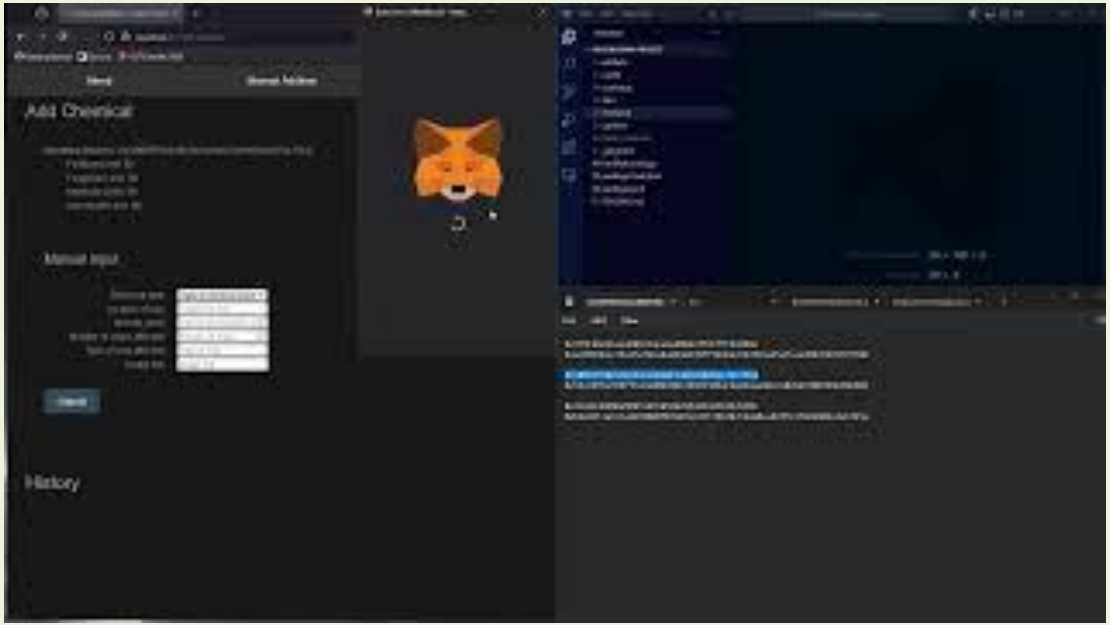
Backend Architecture



04

Live Demo

YouTube Video



(A fall-back YouTube video for if the live demo fails, for some reason.)

GitHub Link

A GitHub repository for this project can be found here:
https://github.com/raspberrymilkyway/blockchain-project

05

Future Potential

Potential Future Extensions

- Encrypt data
  - Current approach makes encryption fairly useless, so a different approach would have to be used
- Improve frontend
  - Display information more cleanly on the page
  - Organize history better
  - Allow filtering through history for specific values
- Extend IoT simulators
  - Image detection
  - More variety and realism in data
- Find project limitations (How many IoT devices can be supported at once? etc.)
- Connect actual IoT devices + test on an actual farm
- Fix any remaining weird behavior (multiple history entries on frontend)

Thank you!

CREDITS: This presentation template was created by **Slidesgo**, and includes icons by **Flaticon** and infographics & images by **Freepik**