Automated Indoor Nursery

Department of Electrical and Computer Engineering
University of Central Florida

Showcase Presentation
EEL4915 - Fall 2022
Group 10
Nicholas Leon - Electrical Engineer
Mariana Lozano - Electrical Engineer
Austen Ordos - Electrical Engineer
Hamzah Ullah - Computer Engineer

Overview

Product Description:

➔ An indoor plant system that provides enough water and sunlight to keep these herbs alive.
➔ This device monitors all the components needed to help these herbs grow and stay healthy.
➔ Indoor gardening allows for a stable food supply for consumers whether it's at home, a restaurant, or retailers.
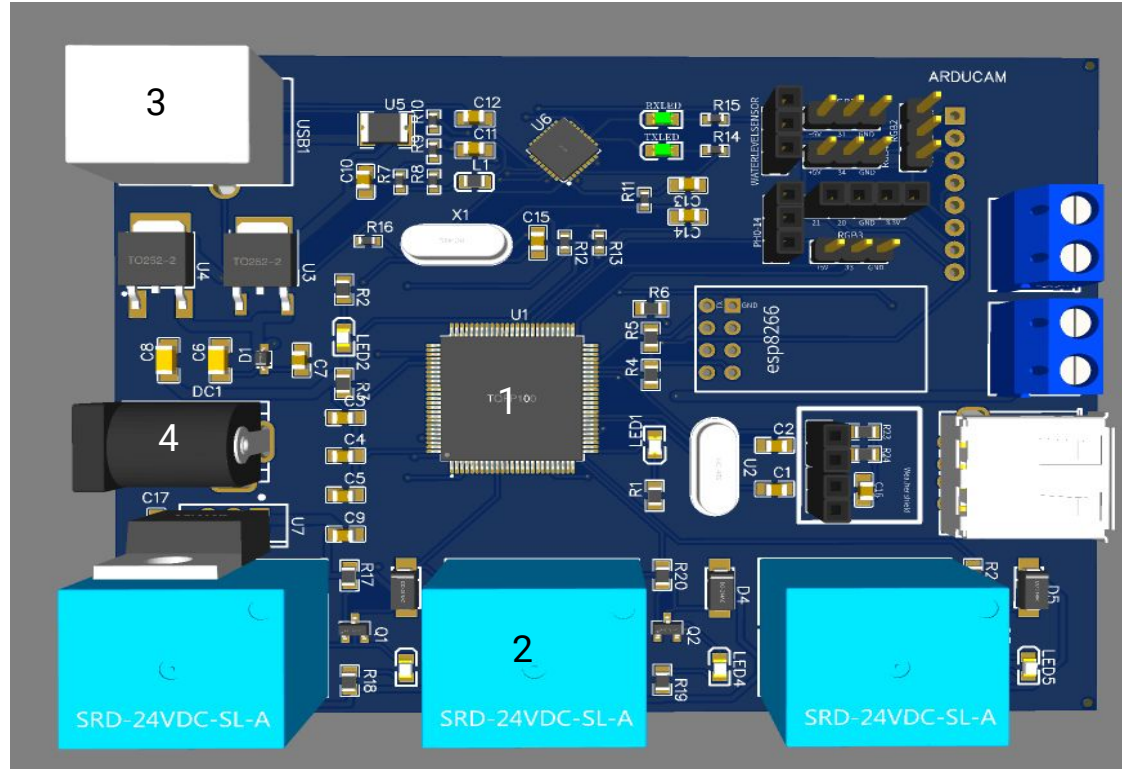
Motivation:

➔ Provide ease of mind to customers so they can be worry free while they are away.
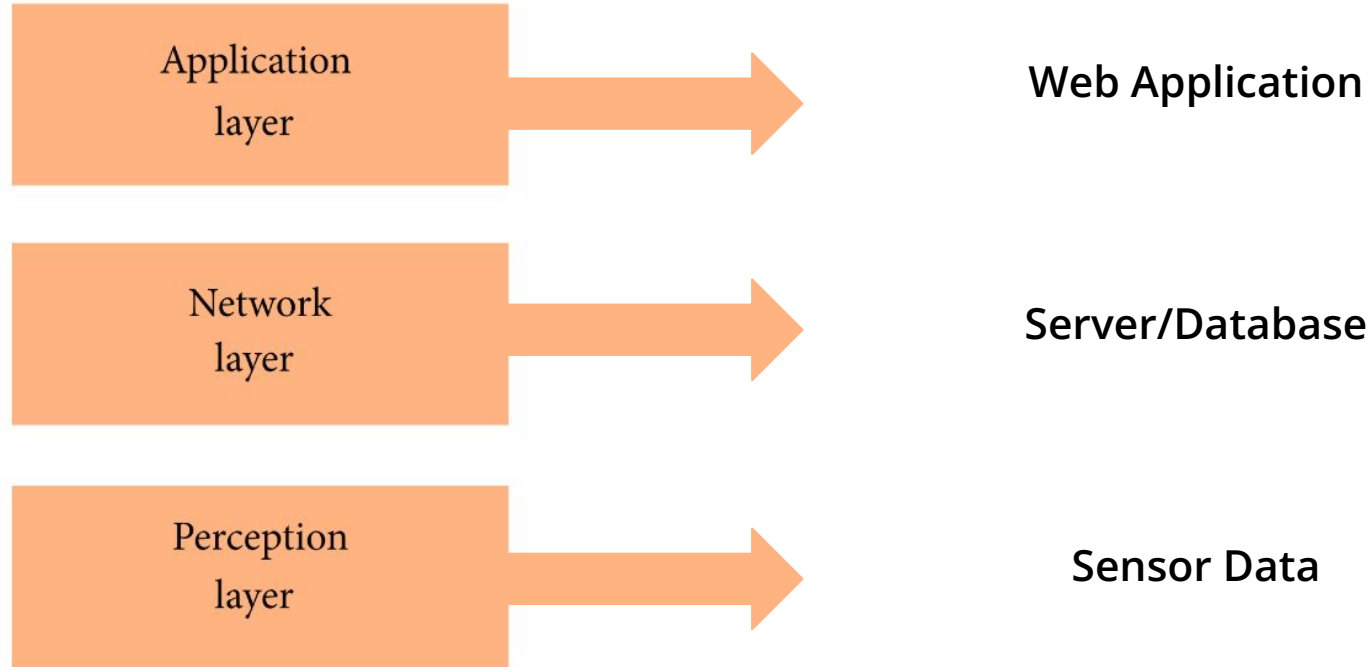
PCB Functionality

1. MCU - Arduino 2560
2. Relays
3. USB type B - Flashing
4. Barrel plug

PCB Functionality

5. 5V peristaltic pump and RGB squares

6. 5V water pump

7. Voltage regulators

8. Wi-Fi module

Software Design

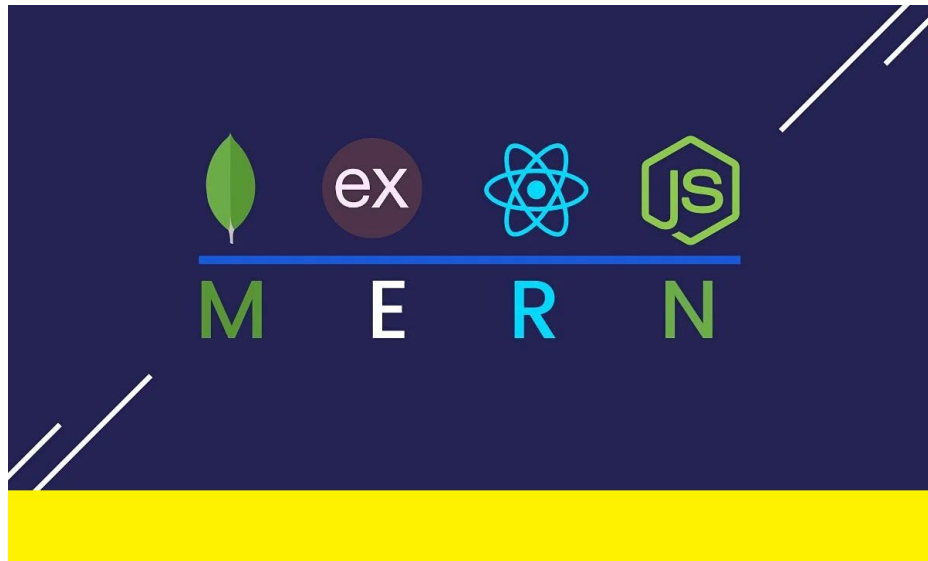|	
Application layer	→ Web Application
Network layer	→ Server/Database
Perception layer	→ Sensor Data

Web Application

➔ User Interface
   ◆ React
   ◆ UI Framework: Semantic UI
   ◆ GraphQL Query Language
   ◆ PWA - Progressive Web Application

➔ Backend Interface
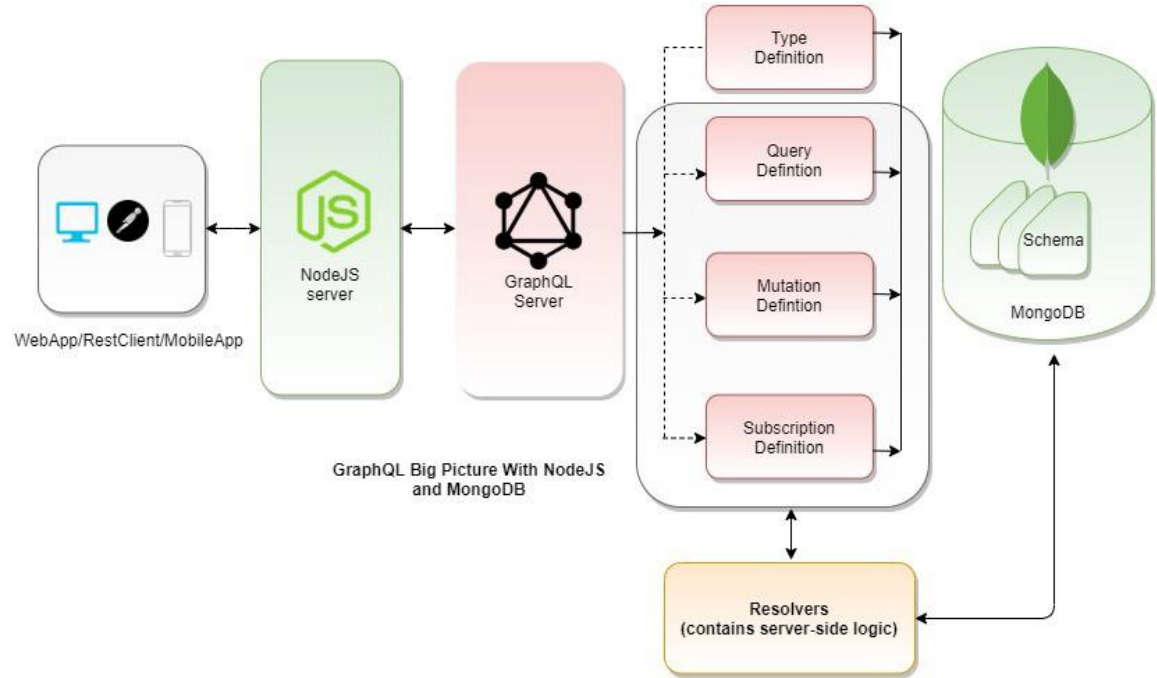   ◆ ExpressJS Server
   ◆ NoSQL Mongoose Database
   ◆ NodeJS

Deployed through Heroku

https://automatic-indoor-garden.herokuapp.com/

Network: Server/Database

➔ Document Object Model of MongoDB in conjunction with a GraphQL querying language

➔ Allows us to pull a single document query instance per database call, while tailoring document for only relevant data with GraphQL

➔ Retool REST API Generator to create a layer sending and retrieving data between the website and Wi-Fi module

WebApp/RestClient/MobileApp

NodeJS server

GraphQL Server

GraphQL Big Picture With NodeJS and MongoDB

Type Definition

Query Defintion

Mutation Defintion

Subscription Definition

MongoDB

Schema

Resolvers (contains server-side logic)

Work Distribution

Mariana, Austen, and Nick are the three EEs therefore were responsible for the printed circuit board. The three worked together on the testing, PCB schematic, and prototyping.

Hamzah is the sole CPE therefore responsible for the software aspect of the project. He worked on our website and interface.

In the end we all contributed to every aspect of the overall project with the help of one another.

Thank you for watching our presentation we hope you enjoyed it!