



Smart Garden

Project #15004117

Workshop: Web Application.

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Project Overview

- Smart Garden is an automated garden management system that uses sensor data and weather information to optimize irrigation.
- The system monitors soil moisture levels and environmental conditions to determine when and how much to water each plant.
- Smart Garden includes a user-friendly mobile application for monitoring, manual adjustments, and scheduling.
- The goal of the project is to simplify garden maintenance, improve plant health, and reduce water consumption by integrating technology with traditional gardening practices.



The Problem



Lack of Time or Experience

Many people lack time or experience to maintain a healthy garden.



Inefficient Manual Irrigation

Manual irrigation is inefficient and difficult to manage consistently.



Wasted Water

Water is often wasted due to a lack of real-time soil data.



No Remote Control

There is no easy way for users to monitor and control their irrigation remotely.

Our Solution Description



Automated Irrigation

The system automatically delivers water to each plant according to its specific needs, eliminating manual effort.



Real- Time Monitoring

Soil moisture sensors continuously monitor conditions. Plants always receive the right care at the perfect moment.



Hardware Fault Detection

The system detects and alerts users to any sensor or valve issues in real time, preventing waste and damage.



User-Friendly Mobile App

A user-friendly mobile app provides instant control and real-time updates, accessible from any device.

Solution Architecture



Database(MySQL)

Stores user information, system settings, sensor data, and irrigation history for future analysis.



Raspberry Pi

Collects sensor data, controls irrigation valves, and communicates with the server.



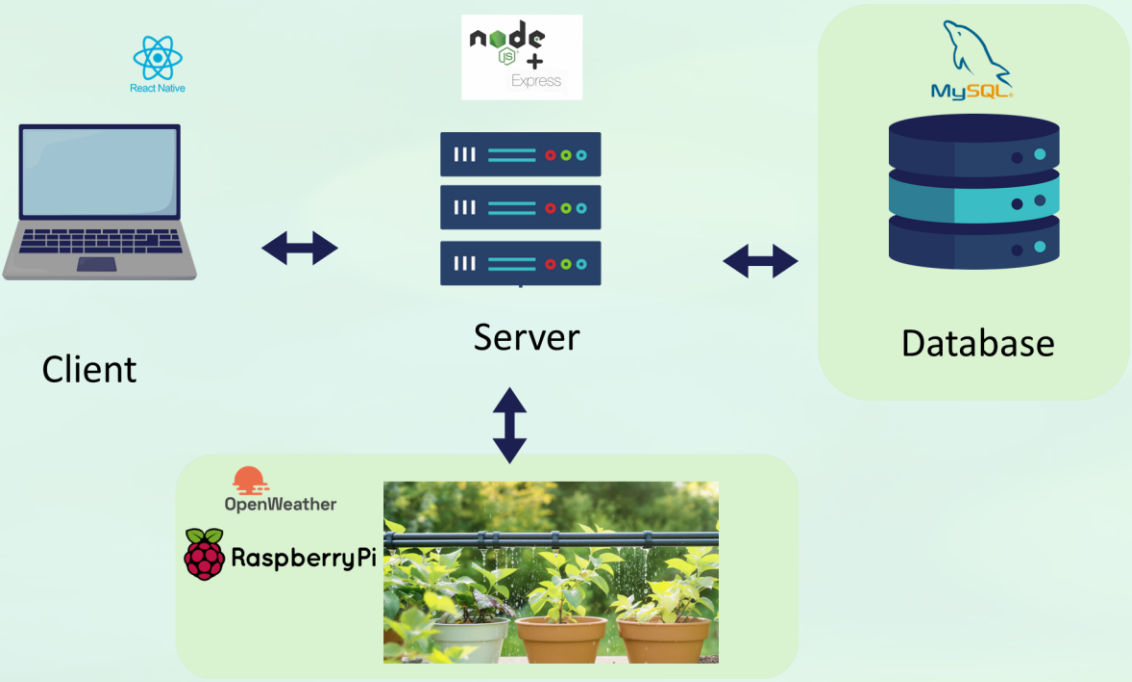
Server (Node.js & Express)

Acts as the backend for the mobile app.
It communicates with the Raspberry pi to fetch real-time data like soil moisture and handles user requests.

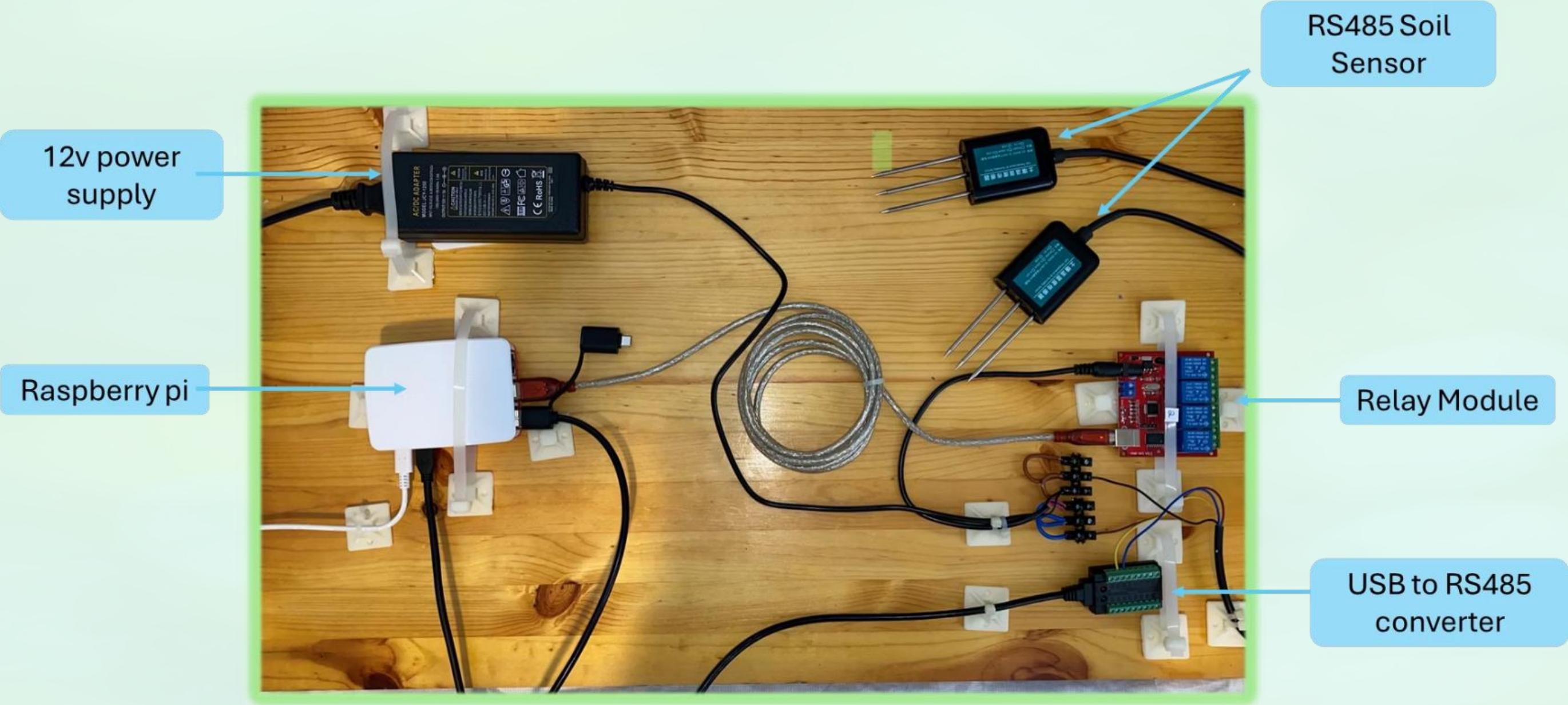


Mobile App (React Native)

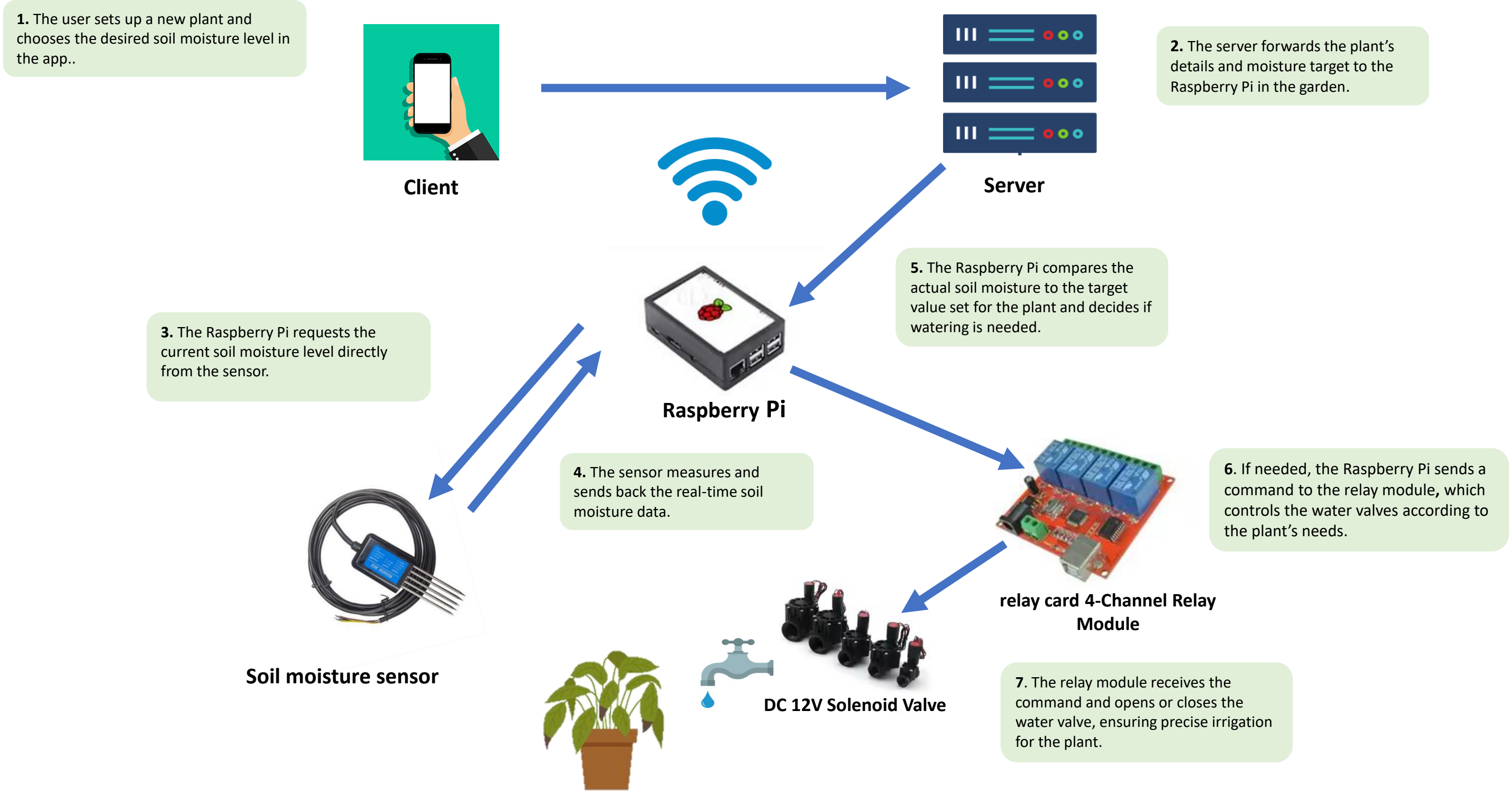
Provides a user interface for managing garden settings, receiving updates, and interacting with the system.



Hardware Implementation



Irrigation Workflow: Adding a New Plant



Demo



The Irrigation Algorithm: Two Key Steps

The irrigation algorithm is the core logic that decides **when** and **how** to water each plant in our smart garden system.

1

Irrigation Action (How Much?)

Waters each plant according to its specific needs, using real-time soil moisture data to avoid overwatering and save water.

2

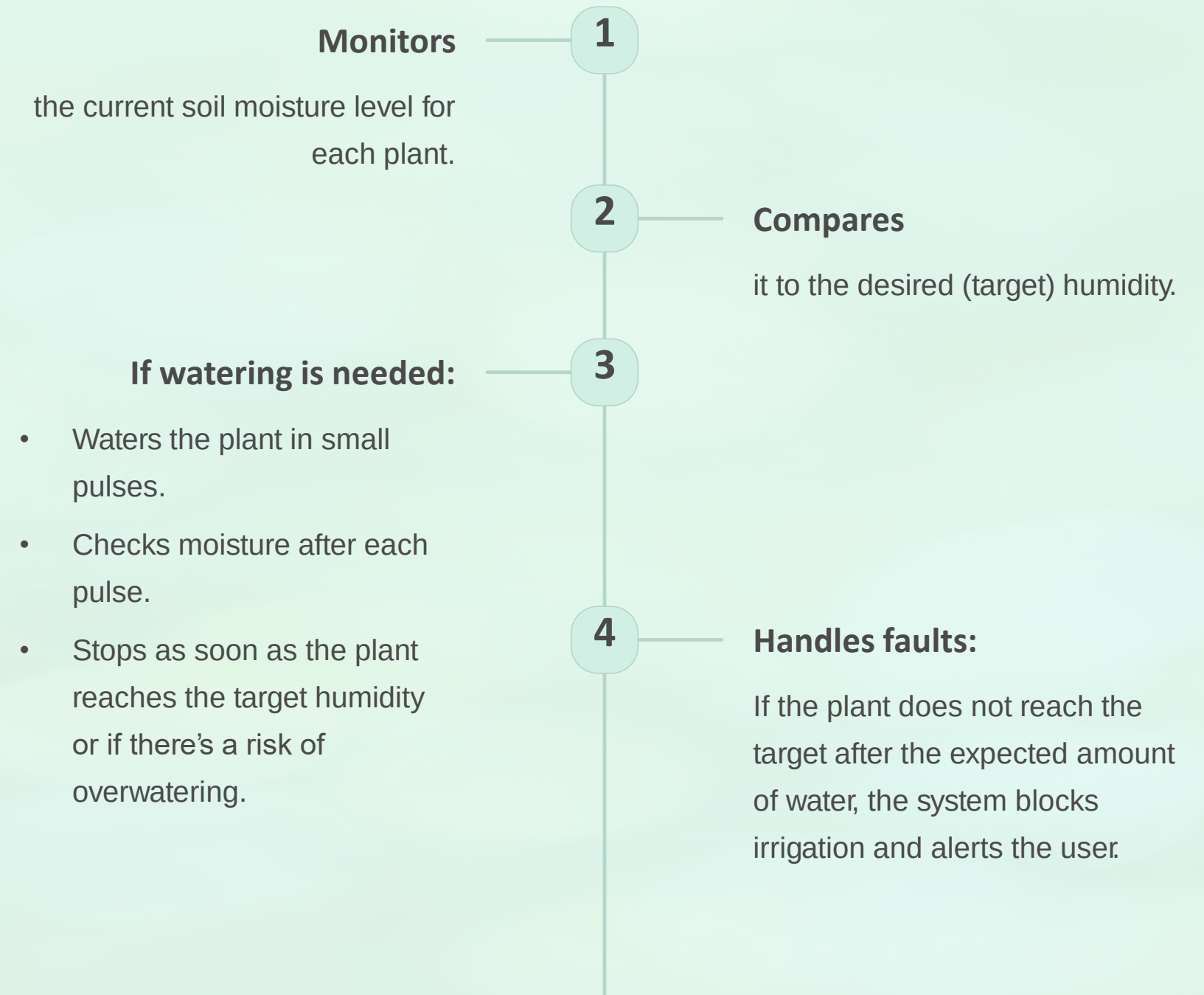
Irrigation Timing (When and How Often?)

Determines the best time to irrigate by considering weather forecasts and user-defined schedules.





How Do We Water Each Plant?





Up Next

1

Build the backend server and establish communication with the Raspberry Pi.

2

Develop the client application for user interaction.

3

Create and integrate the project database.

4

Improve the irrigation algorithm by adding AI for smarter watering.

Questions?

Thank you for your attention. We welcome any questions about our Smart Garden system.

