a P.L.A.N.T. (a Potable Little Autonomous Nourishing Technician)

Presented by: Dylan McKeever, Ben Neuendorf, Devon Simmons

Advised by: Dr. Aleksander Malinowski

Outline

I. Introduction
II. Problem Background
III. Statement of the Problem
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Problem Background

- Monitoring systems already exist for the industrial scale
  - Barriers to entry
  - Features
  - Usability
  - Connectivity

Statement of the Problem

Existing Greenhouse monitoring systems are prohibitively complex and expensive for the typical consumer below an industrial level

Functional Requirements

- Data Acquisition
  - Soil Moisture
  - Soil-level Humidity
  - Ambient Light
  - Ambient Temperature
- Actuators
  - Watering system interface
    - auto calibration
- Connectivity
  - MQTT
  - Web Page Configuration
  - Frost Alert

Future Development

- Cloud Integration
- Mesh Setups
- More sensor types
- Remote access
- Solar Power

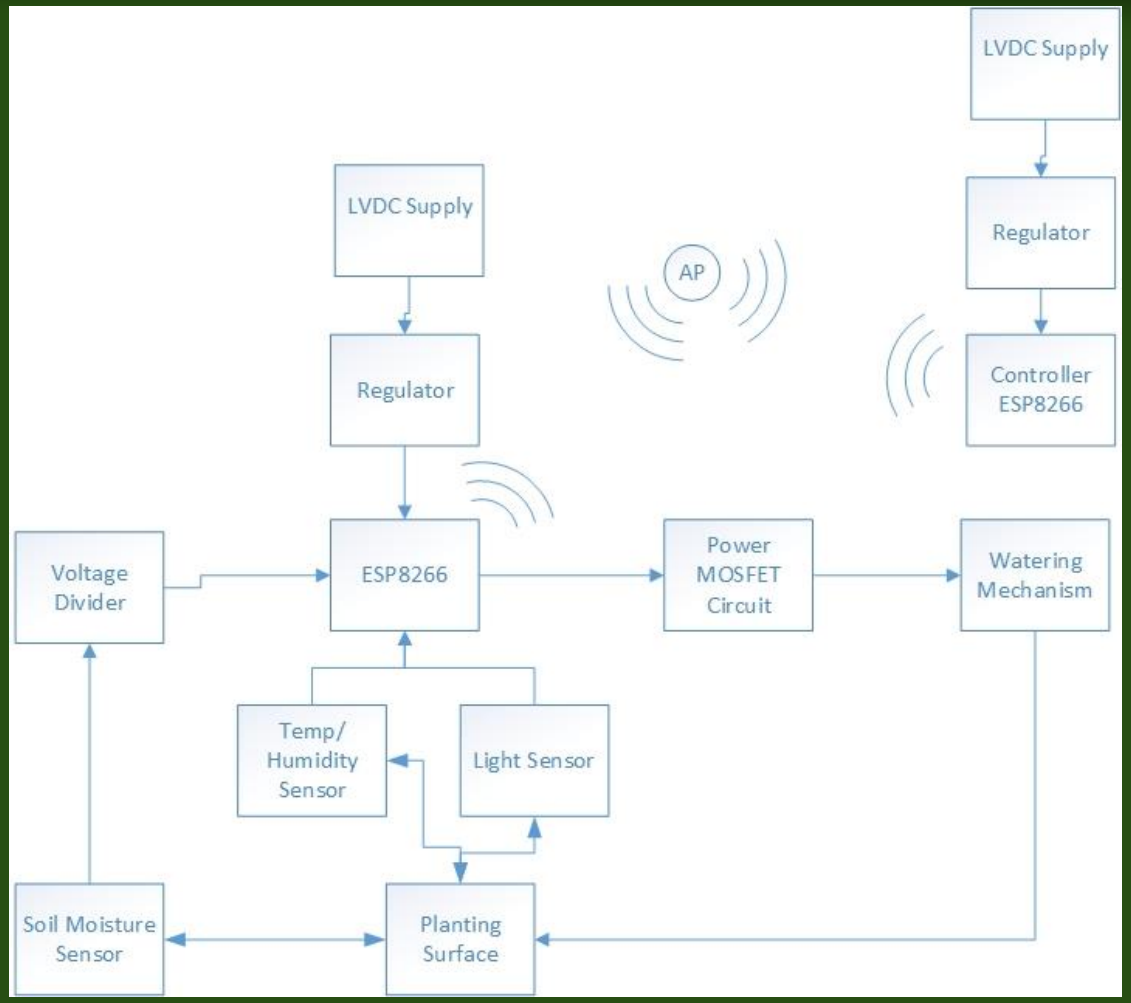
Specifications

- Device cost less than 100$ usd
- Maximum Power Consumption on Active state <= 15 watts
- 12 volt input
- Water Resistant
- Ease of Deployment
- Minimal User Maintenance

Device Design

- One device, two roles
- ESP8266 Controller
- Sensors
  - Analog Capacitive Moisture sensing
  - Digital Light, Temperature, Humidity sensing
- Watering Interface
  - Output Controlled
  - Versatile

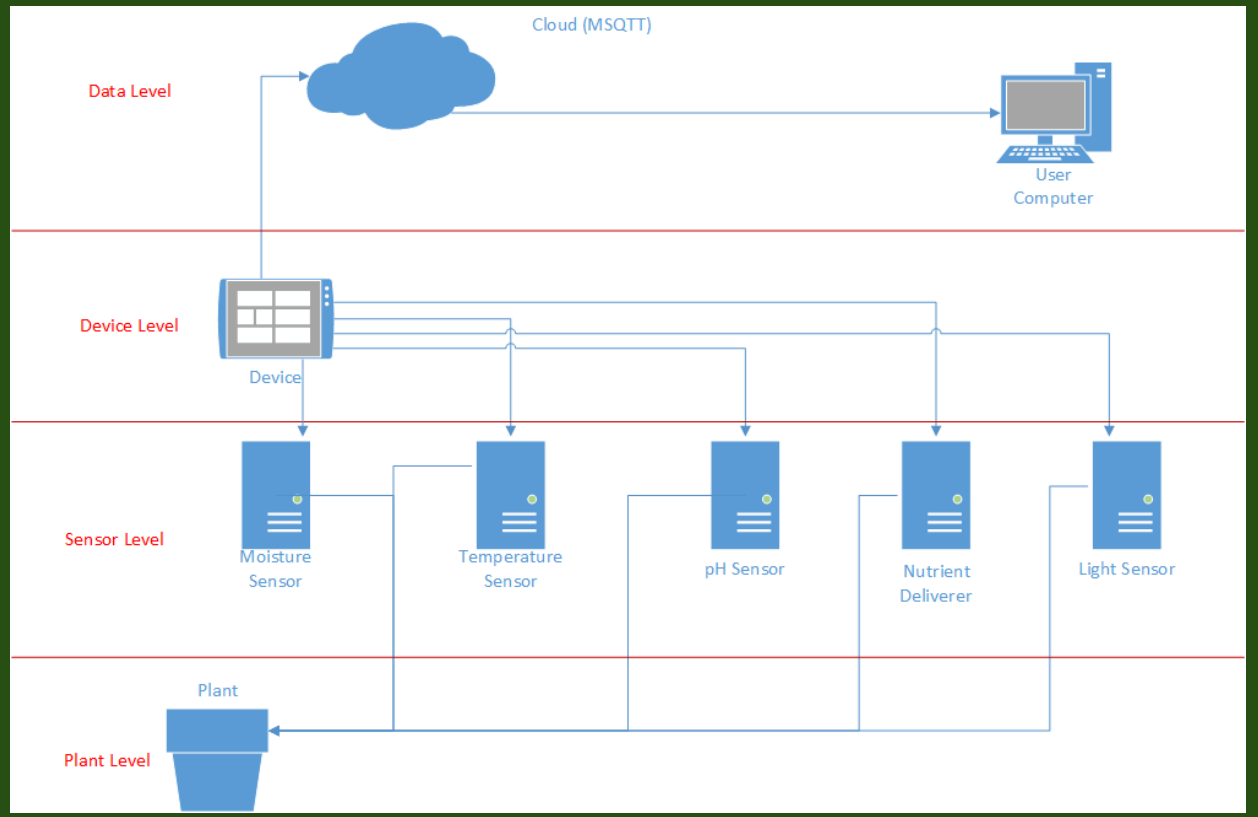
Hardware Block Diagram



Operation Modes

- Active Sensor Mode
- Sleep Mode
- Deep Sleep Mode
- Water Calibration

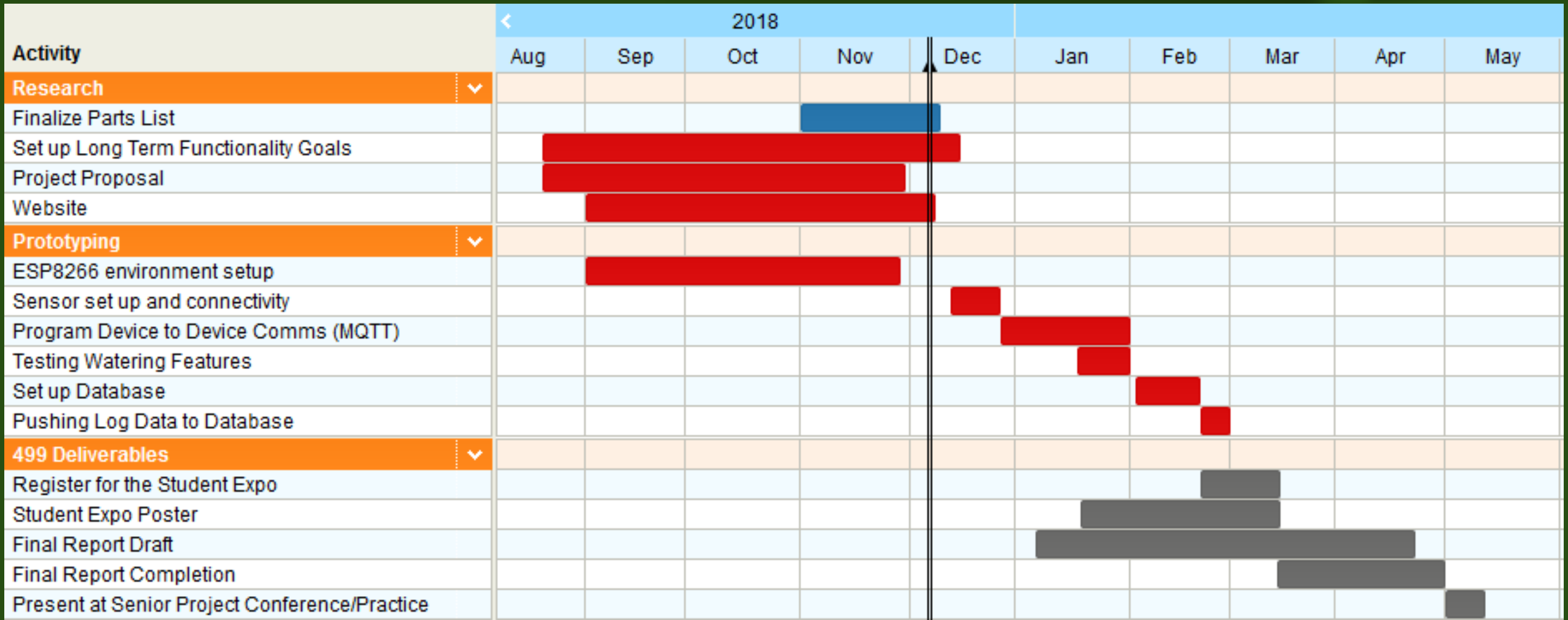
Broad Overview of the System



Parts List

Description	Quantity	Cost	Seller
NodeMCU ESP8266 Board	6	10.97	Amazon Seller
Adafruit TSL2591 High Dynamic Range Digital Light Sensor	2	6.95	Adafruit
Gravity: Analog Soil Moisture Sensor For Arduino	3	2.7	dfrobot
Plastic Water Solenoid Valve - 12V - 1/2" Nominal	2	6.95	Adafruit

Project Plan



Division of Labor

Sensor and Bare Metal Programming Controller Side - Devon
Light Sensor - Ben
Soil Level Humidity Sensor - Devon
Ambient Temperature - Ben
MQTT Connections - Dylan
Database - Dylan

References

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Questions?