



SMART GARDEN

Consumer Level Irrigation System

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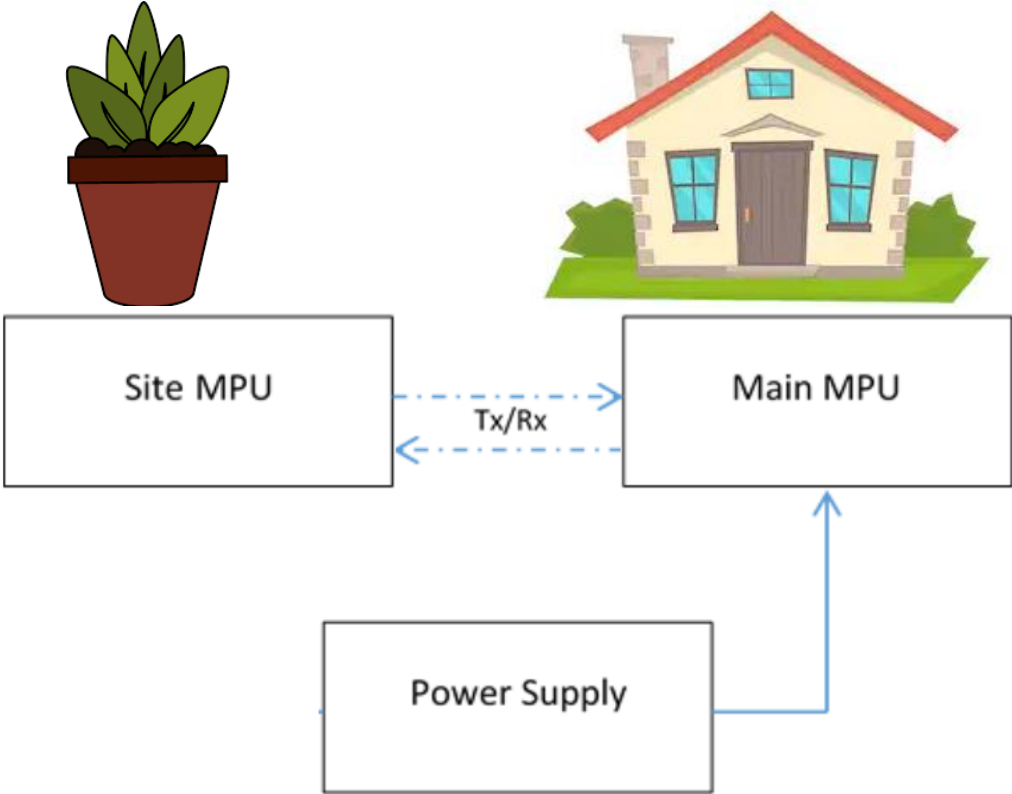
About Smart Garden

- What are we trying to solve?
- How is it currently being done today?
- Why choose Smart Garden over the rest?

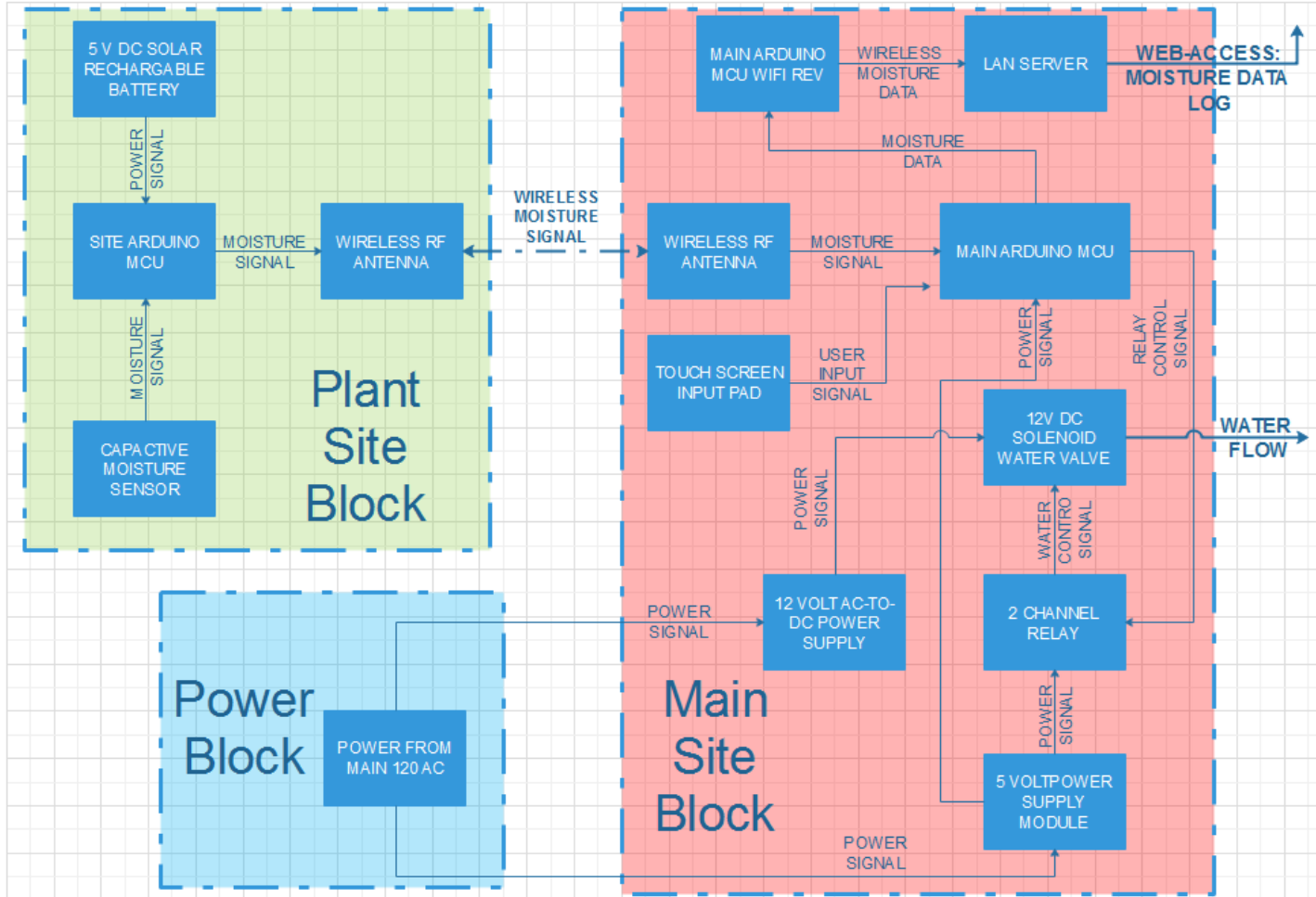




The Modules



High Level Design





Hardware

- **Complexity was introduced** to the system to **increase the availability of incoming and outgoing data** → creates challenges → increase learning curve within development.
- Intricacies when working with the Arduino platform:
 - **Less commonly used boards hold less support** available for **peripherals modules** and thus can lead to problems for designers if proper boards and modules are not properly paired and selected for.
- The system operates upon a few simple streams of data and an easy to operate user interface:
 - Peripheral devices collect moisture data and send this data to the main terminal that governs watering and uploading of information.



WiFi and Database System

- Design trade-offs and testing
 - WiFi
 - ESP8266 WiFi chip
 - Arduino Uno WiFi Rev2
 - Website
 - localhost
- How system works (some further details)
 - First Step : Get WiFi

Smart Garden Irrigation System



Time

Mon Mar 30 2020 23:12:54 GMT-0400 (Eastern Daylight Time)

Moisture Level: 75

Threshold: 75

Moisture:

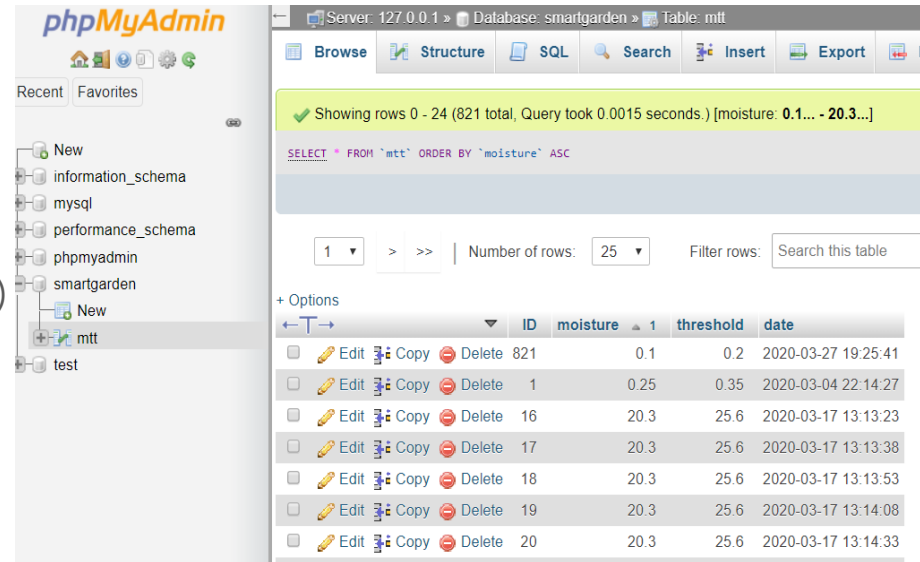
Threshold:

Save



WiFi and Database System

- Second Step: Receive Data from the Site
- Third Step: Send Data to Database (phpmyadmin)
- Last Step: Update Data to website (localhost)



The screenshot displays the phpMyAdmin interface for a database named 'smartgarden'. The table 'mtt' is selected, and the following SQL query is executed: `SELECT * FROM 'mtt' ORDER BY 'moisture' ASC`. The table contains 24 rows of data, with columns ID, moisture, threshold, and date. The data is as follows:

ID	moisture	threshold	date
821	0.1	0.2	2020-03-27 19:25:41
1	0.25	0.35	2020-03-04 22:14:27
16	20.3	25.6	2020-03-17 13:13:23
17	20.3	25.6	2020-03-17 13:13:38
18	20.3	25.6	2020-03-17 13:13:53
19	20.3	25.6	2020-03-17 13:14:08
20	20.3	25.6	2020-03-17 13:14:33





How we Fulfilled our Requirements

- Precise performance
- Communication
- Automated and easy to use





DEMO TIME!!



Questions?



WiFi and Database System Code

```
#include <WiFiNINA.h>
#include <SPI.h>
char ssid[] = "Ann12345";// WiFi Name
char pass[] = "*****"; // WiFi Password
int status = WL_IDLE_STATUS;
char server[] = "192.168.0.20";//Local IP
double moisture;
double threshold;
WiFiClient client;

void setup() {

  Serial.begin(9600);

  while (status != WL_CONNECTED) {
    Serial.print("Attempting to connect to Network named: ");
    Serial.println(ssid);
    status = WiFi.begin(ssid, pass);
    delay(10000);
  }

  Serial.print("SSID: ");
  Serial.println(WiFi.SSID());
  IPAddress ip = WiFi.localIP();
  IPAddress gateway = WiFi.gatewayIP();
  Serial.print("IP Address: ");
  Serial.println(ip);
}
```

```
void loop(){
  delay(10000);
  moisture =75.0;
  threshold =75.0;
  Sending_To_phpmyadmindatabase();
  delay(5000);
}

void Sending_To_phpmyadmindatabase() {
  if(client.connect(server,8012)){
    Serial.print("connected");
    Serial.print("GET /testcode1/index.php?moisture=");
    client.print("GET /testcode1/index.php?moisture=");
    Serial.println(moisture);
    client.print(moisture);
    client.print("&threshold=");
    Serial.println("&threshold=");
    client.print(threshold);
    Serial.println(threshold);
    client.print(" ");
    client.print("HTTP/1.1");
    client.println();
    client.println("Host:192.168.0.20");
    client.println("Connection: close");
    client.println();
  }else{
    Serial.println("connection failed");
  }
}
```





Marketing Requirements

- 1) The product should be easy to use.
- 1) The product should be automated and have minimal human interaction.
- 1) The product should be low cost / cost effective.
- 1) The product should have precise performance.





Engineering Requirements

- 1) MP communication should be retained up to 20 metres.
- 1) Sensor accuracy should be within 5% of actual value
- 1) The system will be responsive within 10 seconds of the moisture level that the user selects.
- 1) Excluding initial setup, the user does not need to interact with the system while system is operating.
- 1) System comes with predefined soil parameters that are ideal for plant growth that the user can select.

