
GadgEon
Engineering Smartness

# Precision Farming Solution

A start-up focusing on solutions to optimize water usage wanted Gadgeon to provide a complete IOT solution with sensor nodes, cloud and mobile apps

**Project Size: 7** members
**Project Duration: 8** months
**Technology Used:** CC3200, MQTT, AWS, Restful APIs, Swift (iOS), Android App

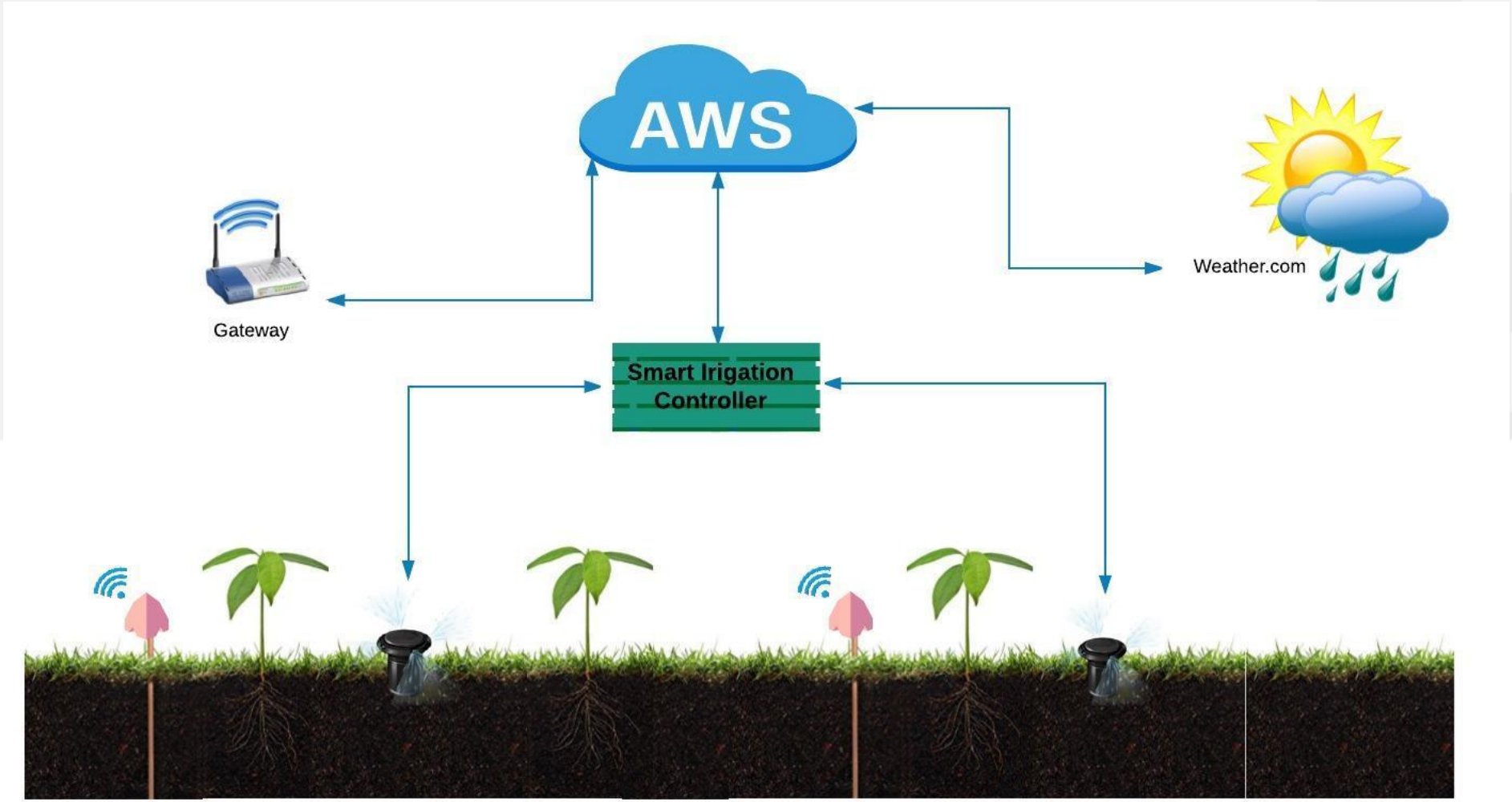
## Challenge

- Precise control of watering based on actual needs at each part of the farm. Needs accurate measurements and control of watering accordingly
- Optimizing the sensor nodes to operate at very low power to get multi year battery life

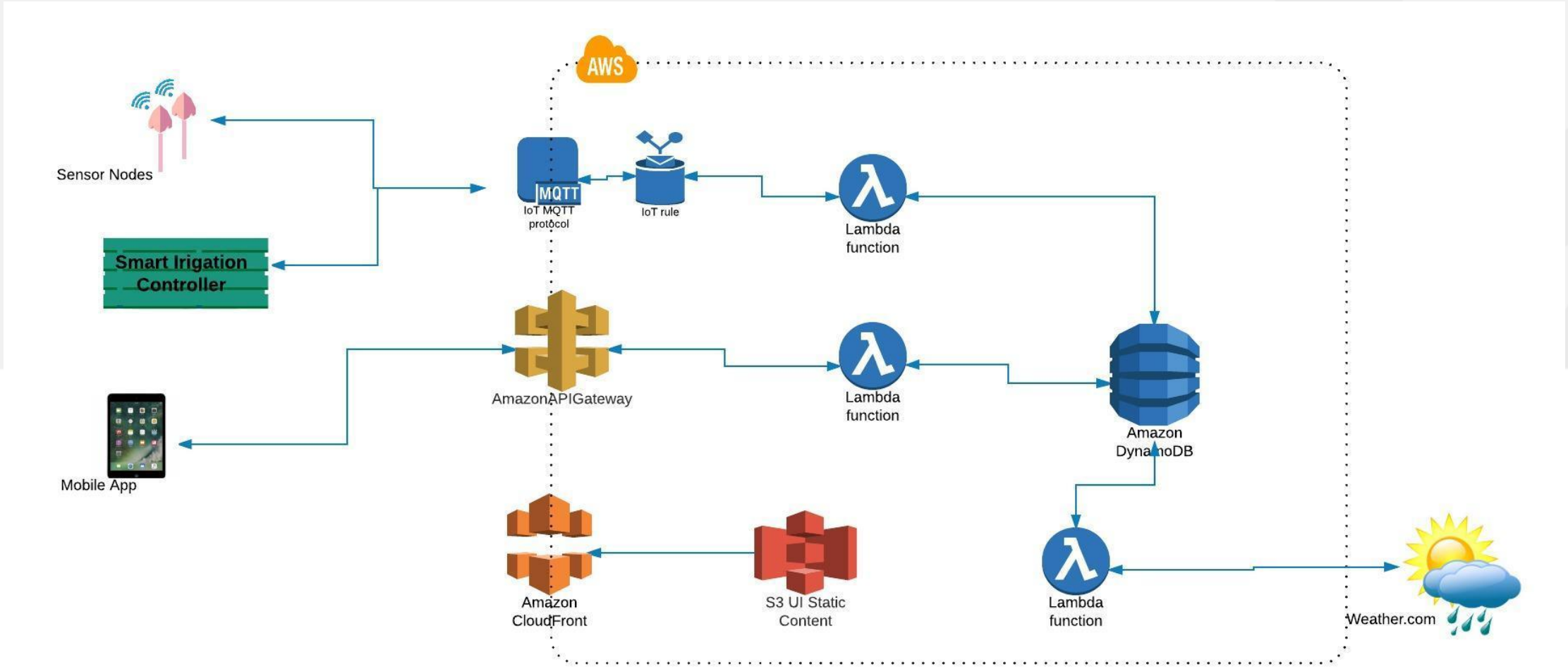
## Outcome

- Fully integrated system involving WiFi enabled sensor nodes, cloud platform and mobile apps. Provides up to 50% savings on water usage, depending on environmental conditions
- Integration to weather.com to control watering based on prediction of rain

# System Overview



# Cloud Architecture



| WHAT DID GADGEON DO? | PLATFORMS/ TECHNOLOGIES USED |
|---|---|
| 1) Sensor mote firmware on cc3200 with various sensors and optimized for low power operation | Integrate soil moisture, ambient light, temperature and humidity sensors to cc3200 microcontroller<br><br>Integrate light weight MQTT stack to the firmware. Collect sensor readings periodically and publish to MQTT.<br><br>Low power optimization. CPU in sleep mode for most of the time. CPU wakes up periodically and turns the radio on to upload sensor readings.<br><br>AP mode for initial setup and configuration over web based GUI.<br>OTA firmware update |
| 2) Cloud application to collect, analyse sensor data and control the irrigation | Collects sensor data and records it to database. Based on data analysis and weather reports controls the irrigation system for each zone with quantity water. Generates reports for users.<br><br>Cloud server hosted in Amazon. AWS IOT is used for MQTT interface between cloud server and sensor nodes and irrigation controller. API Gateway is used for integrating Mobile Apps. AWS Dynamo DB is used as database and AWS Lambda functions are used for implementing business logic. |
| 3) iOS and Android mobile Apps | Create schedules for watering, set preferences<br>MVC architecture, real-time notifications, RESTful APIs for cloud communication<br>Followed the recommended design patterns from Apple and Google. |

**GADGEON SYSTEMS INC**
881 Yosemite Way, Milpitas, CA 95035, USA

**CONTACT - USA**
Wes Schropp – VP Sales : +1-408-621-2570

**CONTACTS - INDIA**
Hari Nair : +91 9895 01 58 80 | Sreenandh : +91 9747 08 66 88

**GADGEON SMART SYSTEMS PVT LTD**
VI 405/E1, Fathima Tower, Malepally Road,Thrikkakara PO, Kochi, Kerala, INDIA, Pin: 682 021

sales@gadgeon.com