IoT Farm Irrigation System

Software Design Specifications (SDS)

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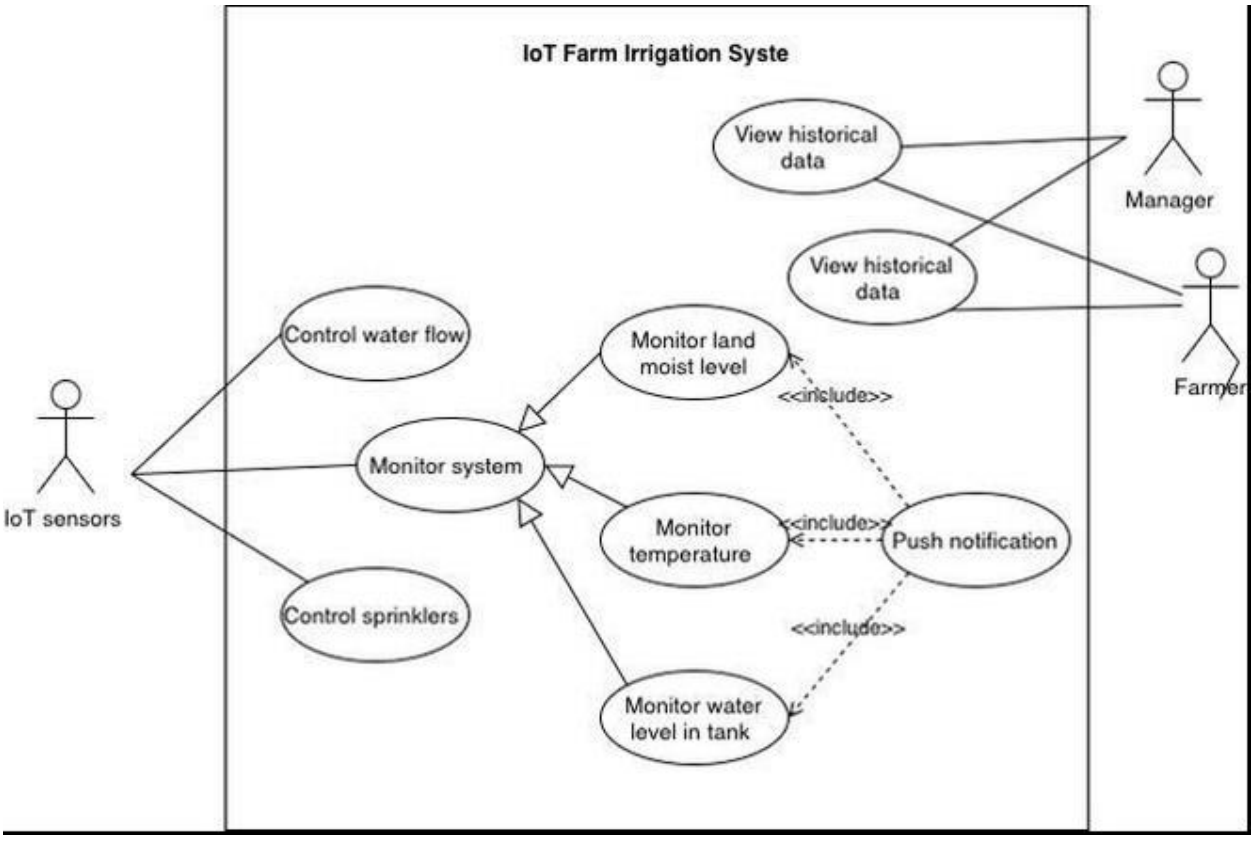
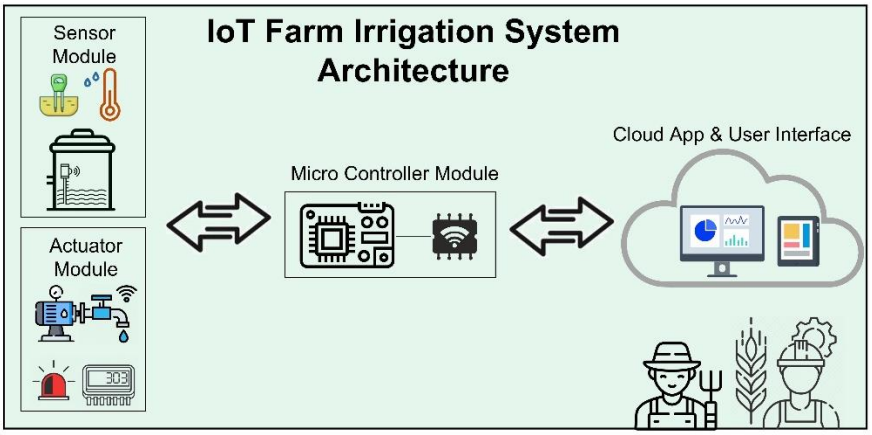
Use Case Diagram:

Use case diagram is used to show the system uses cases with associated actor for each use case along with respective relationship. IoT Farm Irrigation System contains several use cases. There is the monitoring system that have generalization relationship with multiple use cases such as moisture level monitoring and water tank level monitoring. The actors for those use cases are moisture level sensor and level sensor respectively. There is different LCD screens and LEDs which represent the notification required to monitor land data. There is the valve (sprinklers) control use case to control the level of moisture in the land acted by the sensor. Also, there is a water tank level control as different use case to ensure water supply to the land.



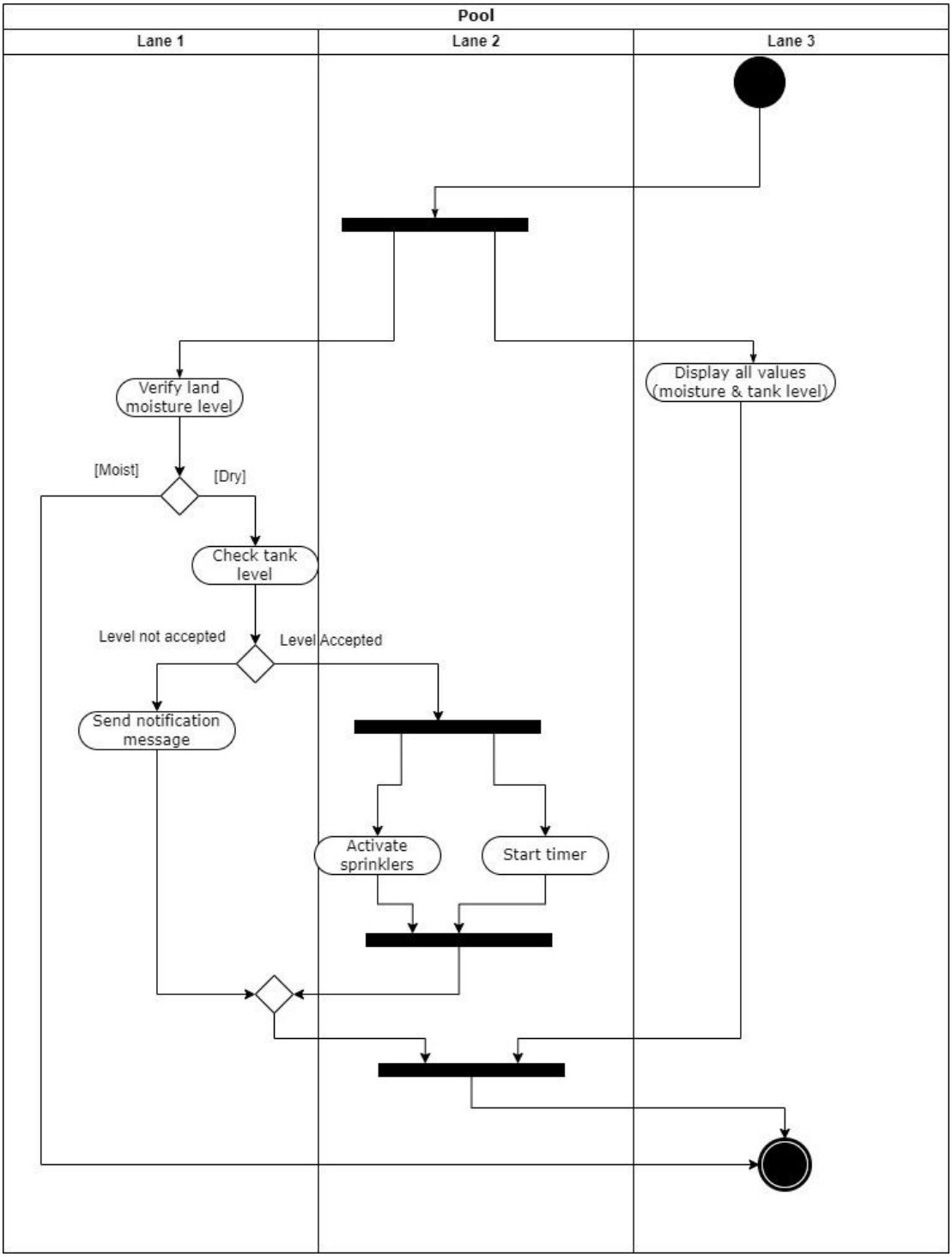
System Architecture Diagram:

The system architecture shown in the below drawing indicates the design structure of the system. There are several sensors and actuators that are connected to a microcontroller unit which is managed in simulated environment using Cisco Packet Tracer.



Activity Diagram:

The activity diagram shown below is providing graphical representation of the use case's logic. As a farmer, I want to ensure my crops (products) get sufficient water supply without over or under supply. Thus, the logic will check moisture sensor and if the land is dry, it need to validate the water level to guarantee that there is enough water supply. Once those conditions are met, the sprinklers will activate and then will stop based on sensor reading. All of the sensor readings are being displayed concurrently.



Sample Use case:

Use case Name	Monitor System Sensors
Actor	Moisture and level sensor
Description	1. The sensor senses the land moisture level. 2. The level sensor checks the water level. 3. For dry land, activate sprinklers until moisture level reaches to the acceptable range set.
Exception	1. Sensor failure.

	2. Sprinklers failure.
Precondition	NA
Post condition	NA

User Story:

As a farmer, I need to control my water supply to the land so that the crops grow naturally without over or under irrigation.