# ASSIGNMENT PRESENTATION : BUILDING INTERNET OF THINGS

COURSE CODE: Z18602

TOPIC: IOT DESIGN METHDOLOGY CASE STUDY

CASE STUDY: AUTOMATED IRRIGATION SYSTEM

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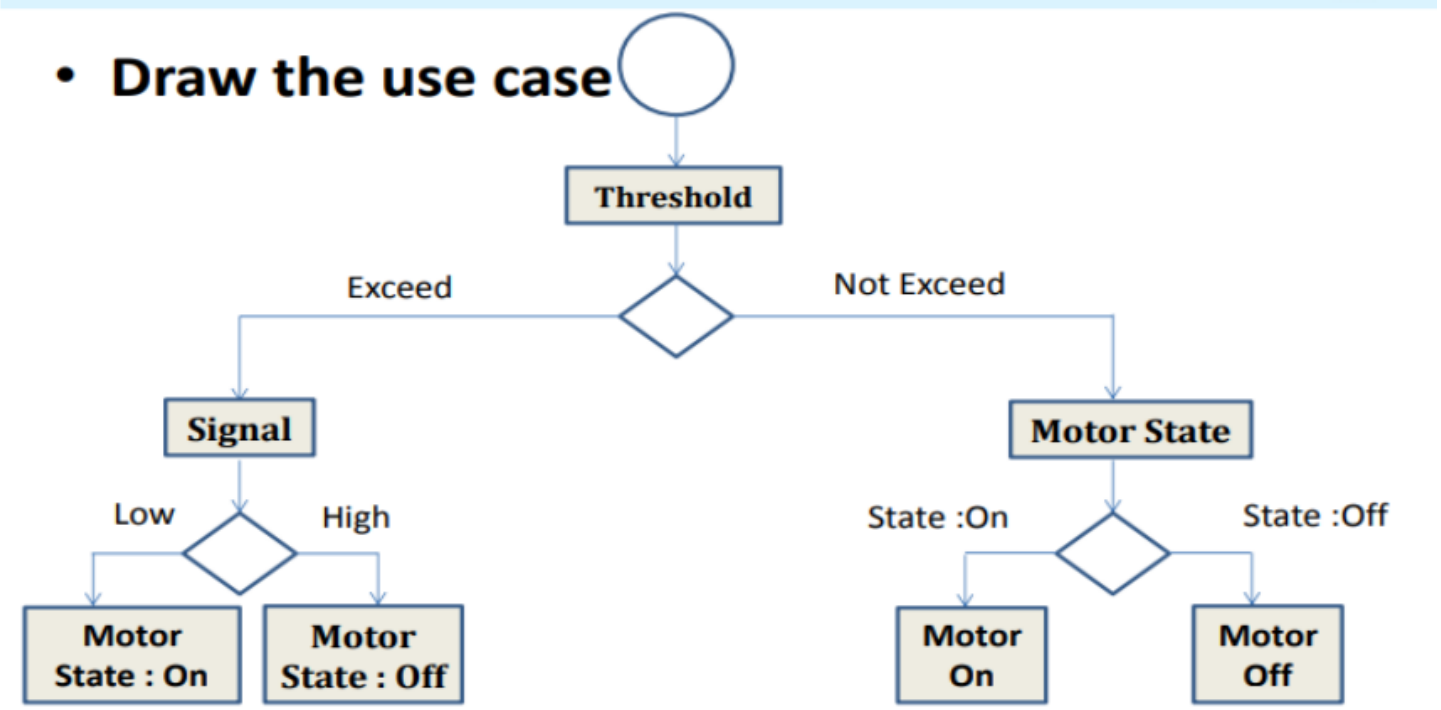
# Step 1 : Purpose and Requirement Specification

- **Purpose :** An automated irrigation mechanism which turns the pumping motor ON and OFF on detecting the moisture content of the earth without the intervention of human.
- **Behavior :** It monitors the amount of soil moisture content in soil. In case the soil moisture of the soil deviates from the specified range, the watering system is turned ON/OFF . if the soil is dry, it will activate the irrigation system, pumping water for watering the plants.
- **System Management Requirement :** system should remotely provide monitoring and control functions.
- **Data Analysis Requirement :** system should perform local analysis of data.
- **Application Deployment Requirement :** Deployed locally on device, but acts remotely without manual intervention.
- **Security :** Authentication to Use the system must be available.

# Step 2: Process Specification

- The second step in the IoT design methodology is to define the process specification. In this step, the use cases of the IoT system are formally described based on and derived from the purpose and requirement specifications.



# Step 3 : Domain Model Specification

**Physical Entity:** In smart irrigation example, the Physical entities involved

- Soil (whose moisture content is to be monitored)
- Motor ( to be controlled)

**Virtual Entity:** Representation of physical entity in digital world – For each physical entity there is a virtual entity.

**Device:**– Medium for interactions between Physical and Virtual Entities.

– Devices are used to gather information from the physical entities.

– In Smart Irrigation System, device is soil moisture sensor and buzzer as well as the actuator attached to it.

**Services :** – A service sets the signal to low/ high depending upon the threshold value.

– A controller service that runs and monitors the threshold value of the moisture and switches the state of motor on/off.

# Step 4 : Information Model Specification

The fourth step in the IoT design methodology is to define the Information Model.

1. Defines the structure of all the information in the IoT system (such as attributes, relations etc.) .

2. It does not describe the specifics of how the information is represented or stored.

3. This adds more information to the Virtual entities by defining their attributes and relations .

# Step 5 : Service Specification

The fifth step in the IoT design methodology is to define the service specifications. Service specifications define the services in the IoT system, service types, service inputs/output, service endpoints, service schedules, service preconditions and service effects.

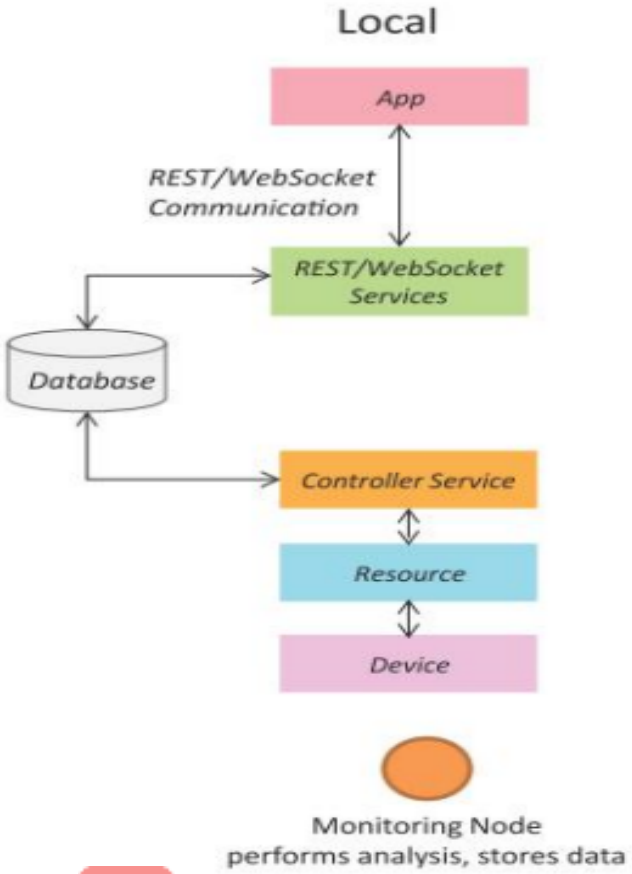
• Define the services in IoT System, service types, service inputs/ outputs, service endpoints, service schedules, service preconditions and service effects.

• Services can be controller service, Threshold service, state service for smart irrigation system.

• These services either change the state/attribute values or retrieve the current values.

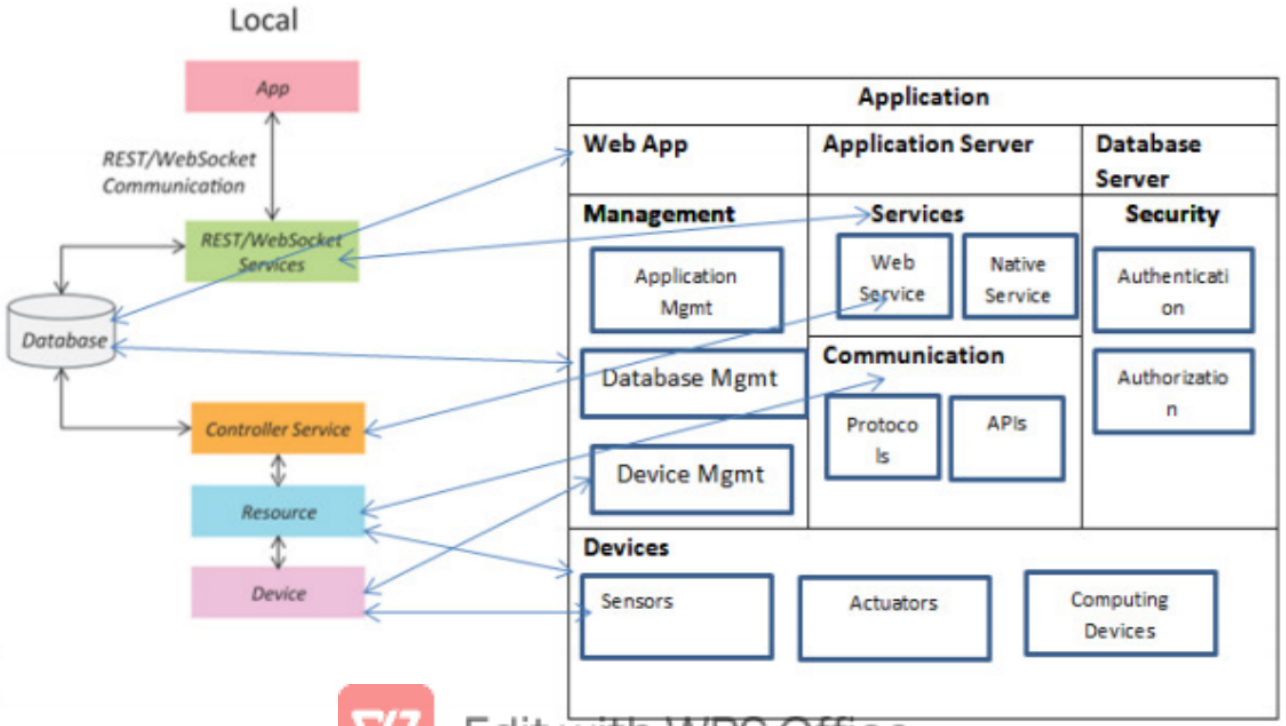
# Step 6: IoT Level Specification

- The sixth step in the IoT design methodology is to define the IoT level for the system.



# Step 7: Functional View Specification

- The seventh step in the IoT design methodology is to define the Functional View. The Functional View defines the functions of the IoT systems grouped into various Functional Groups . Each Functional Group either provides functionalities for interacting with instances of concepts defined in the Domain Model or provides information related to these concepts



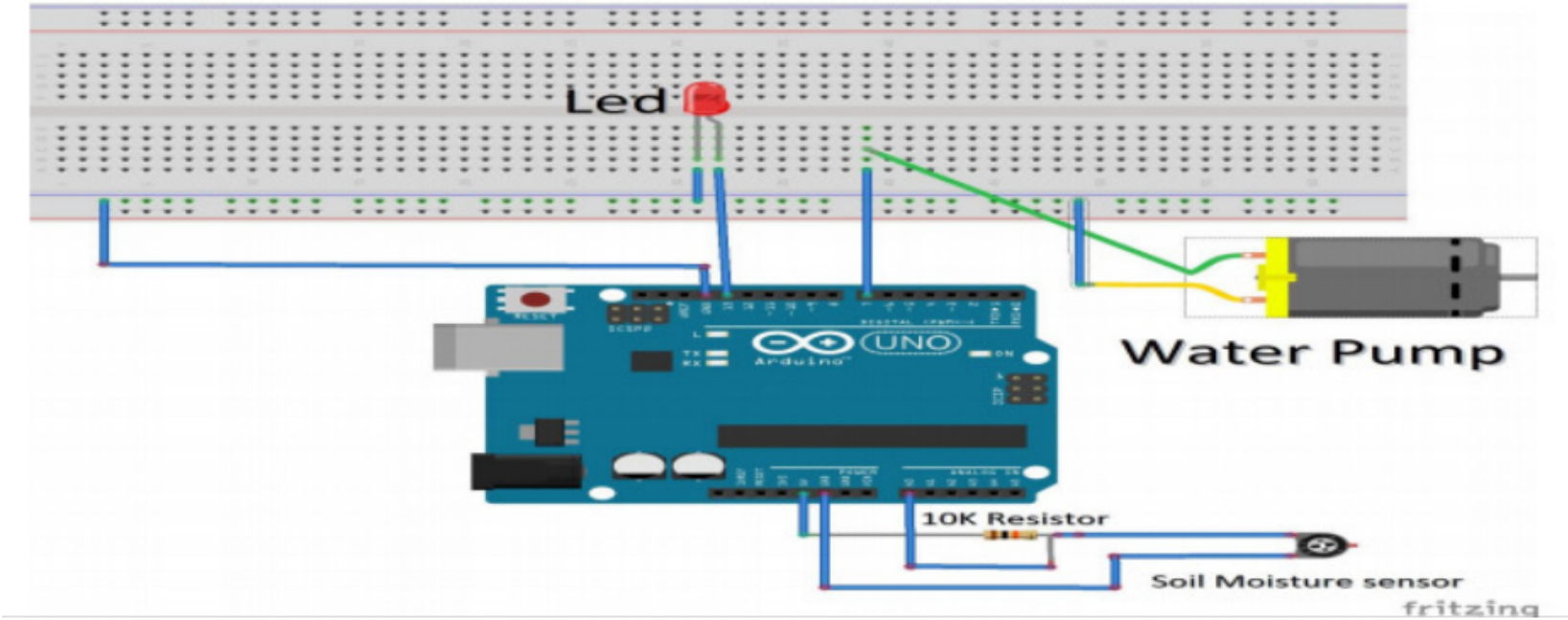
# Step 8: Operational View Specification

- The eighth step in the IoT design methodology is to define the Operational View Specifications.

  In this step, various options pertaining to the IoT system deployment and operation are defined, such as, service hosting options, storage options, device options, applica.tion hosting options, etc

# Step 9: Device & Component Integration

- The ninth step in the IoT design methodology is the integration of the devices and components.



# Step 10: Application Development

- The final step in the IoT design methodology is to develop the IoT application.
- GUI / Screenshot of IoT Application