

Unit 5: IOT Case Studies

Domain Specific IOT

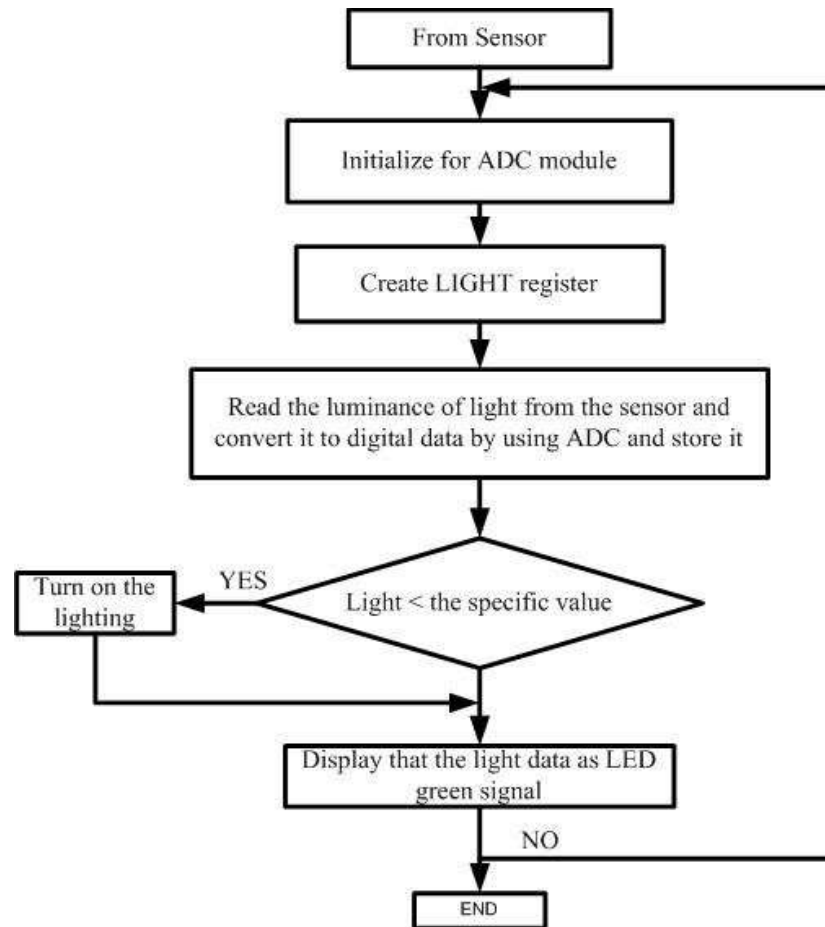
- Home Automation
 - Smart Lighting
 - Smart Appliances
 - Home Intrusion
- Cities
 - Smart Parking
- Environment
 - Weather Monitoring
 - Air Pollution Monitoring
- Agriculture
 - Smart Irrigation

Home Automation

SMART LIGHTING

- The System uses two modes Auto and Manual
- In Auto Mode, it measures the Light and switches the light On or Off accordingly if the room is dark.
- In Manual Mode, the light can be forced to be switched On or Off by the user irrespective of the data received by the light sensor.
- It can also be switched On or Off remotely.

Smart Lighting



Home Automation

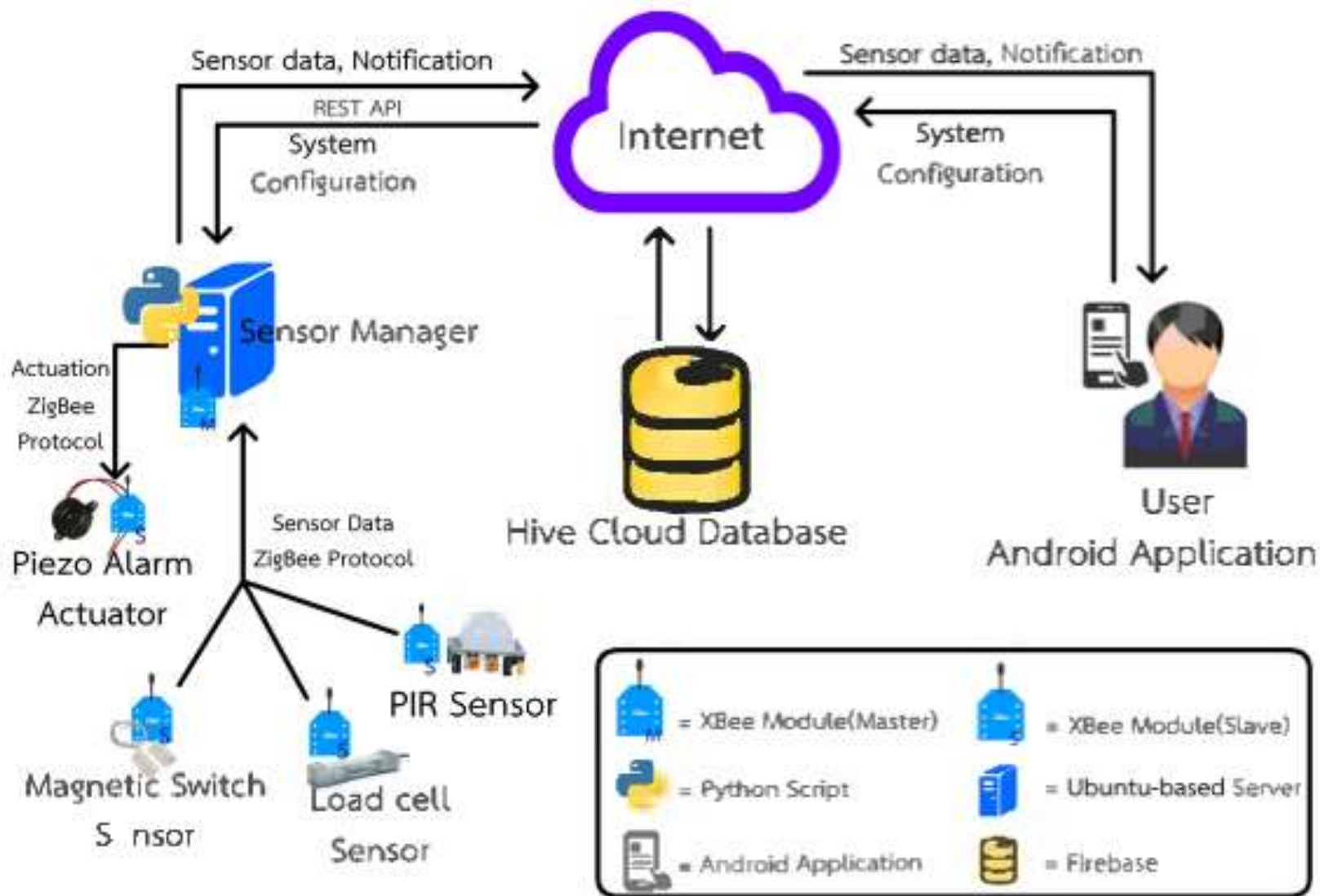
SMART APPLIANCES

- The System when connected to central system and able to be programmed or controlled remotely based on input from sensors detecting factors such Temperature, Light Levels or Activity.
- Example:
 - Refrigerator- Orders Essential food such as egg and milk automatically. Also can detect rotten food.
 - Water Purifier- Can check various water quality parameters and alert the user by sending notification to a phone.

Home Automation

HOME INTRUSION

- The aim here is to detect home Intrusion using sensors such as PIR and Door Sensors.
- PIR or Passive Infrared Sensor can detect movement of Human Body and Door Sensors can detect if the door was opened or closed.
- Events may be logged and stored in a Database
- If an Unauthorized event is detected, the concerned Authority is notified remotely.



Home Automation

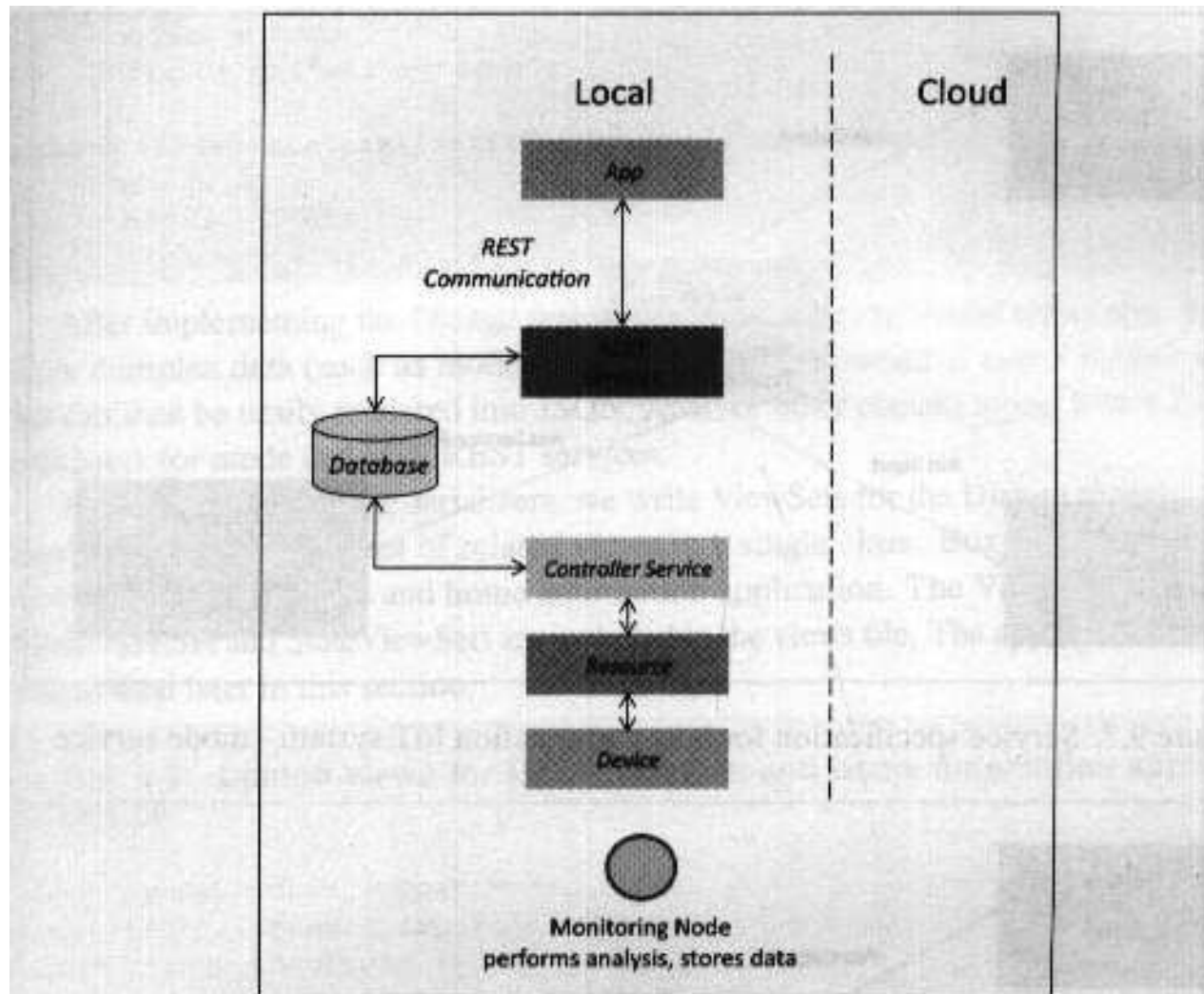


Figure 9.1: Deployment design of the home automation IoT system

Cities

Smart Parking

- The purpose of Smart Parking is to detect Vacant and Allotted Parking spots without human intervention.
- The information is then sent to an Backend Application via Internet.
- These application can be accessed by drivers through Smartphones, Tablets or in car Navigation Systems.
- Information is collected via a Local Controller and sent via Internet to a Remote Server

Smart Parking

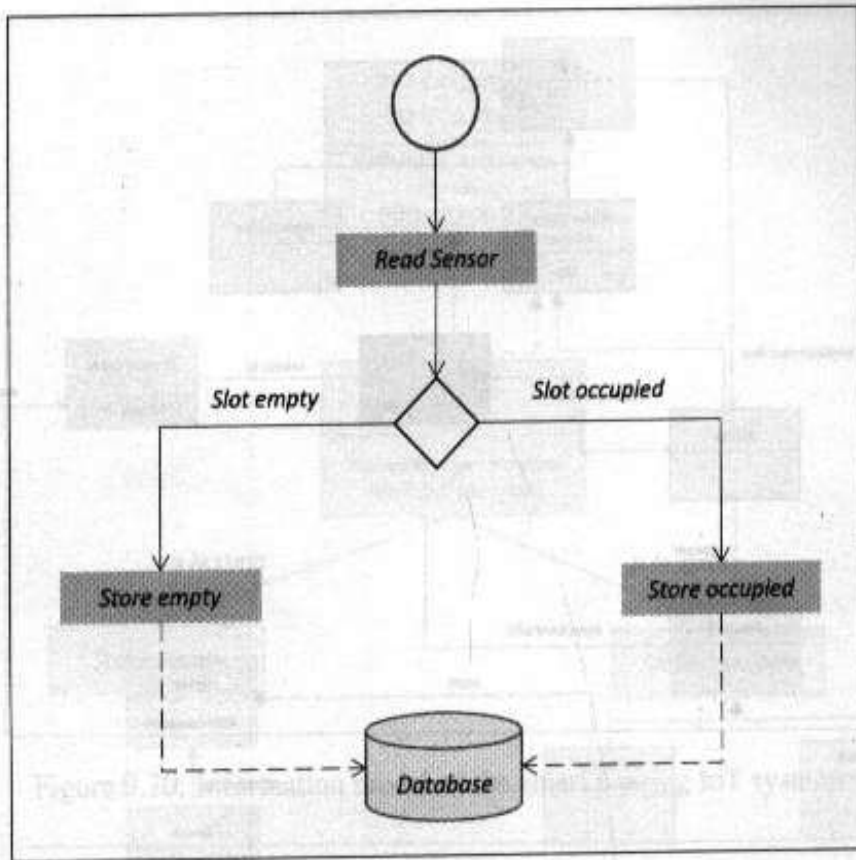


Figure 9.18: Process specification for the smart parking IoT system

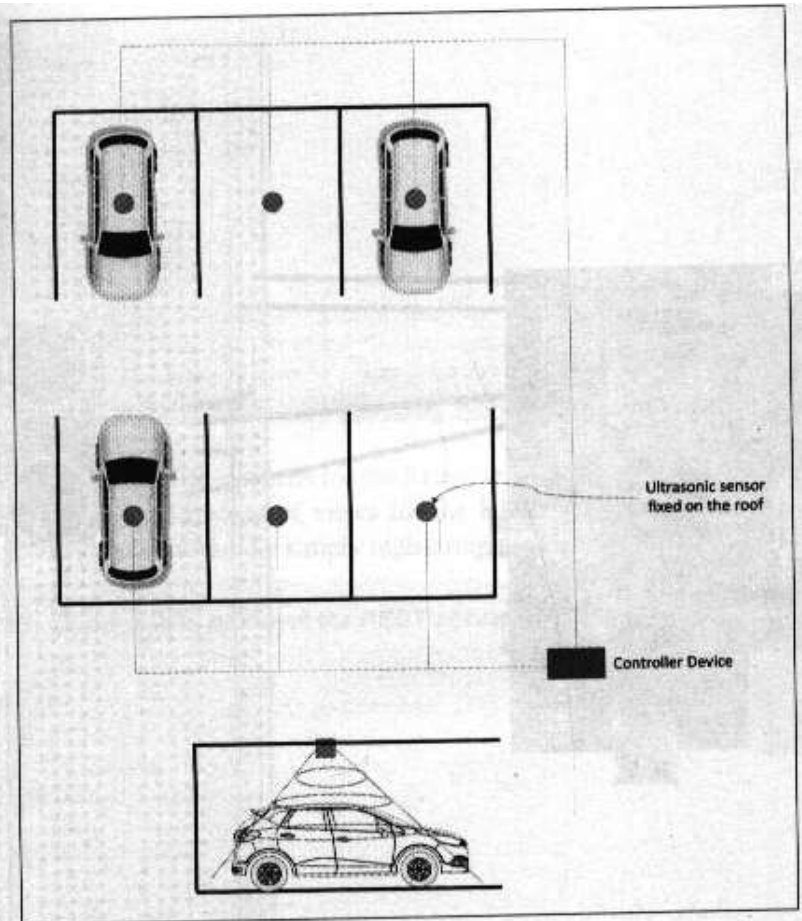


Figure 9.23: Deployment of sensors for smart parking system

Environment

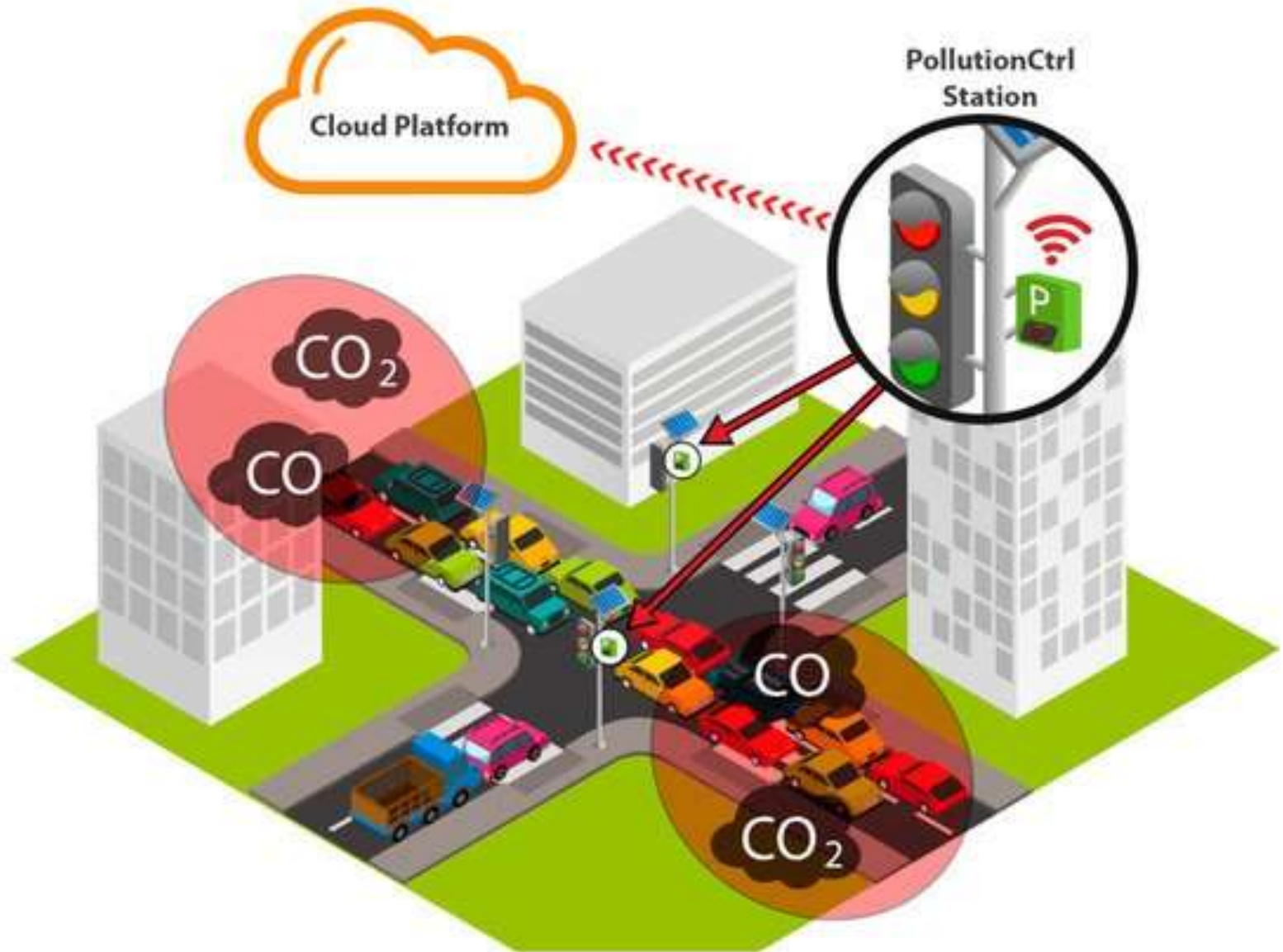
Weather Monitoring

- It collects data on environmental conditions such as temperature, humidity, pressure and light in an area using multiple nodes.
- The end nodes are equipped with various sensors.
- The end nodes send the data to the cloud and the data is stored in a database.
- Analysis is done on the data collected and predictions are made.

Environment

Air Pollution Monitoring

- It collects data on Air Quality (Particles and Contents in Air) such as Carbon Dioxide, Oxygen, Nitrogen etc.
- The end nodes are equipped with various sensors.
- The end nodes send the data to the cloud and the data is stored in a database.
- Analysis is done on the data collected and visualizations are made.



Agriculture

Smart Irrigation

- Smart Irrigation System use IoT devices along with Soil Moisture Sensors to determine the amount of moisture in the soil and release water through irrigation pipes.
- The data on soil moisture is sent to the cloud and the data is stored in a database.
- Analysis is done on the data collected to plan watering schedules.