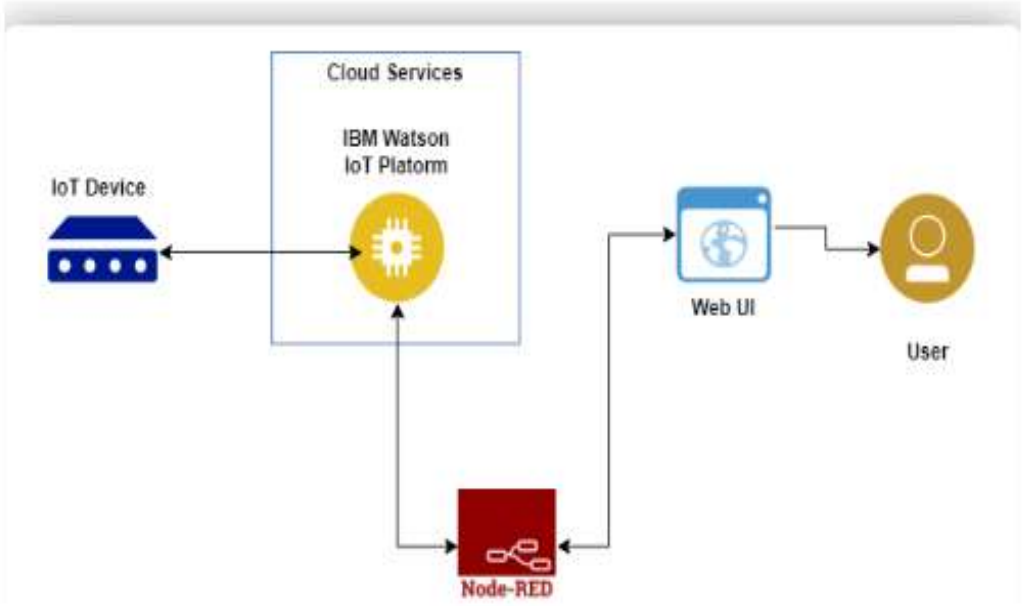
Project Design Phase-I
Solution Architecture

Date	06 May 2023
Team ID	NM2023TMID15707
Project Name	Smart City waste Management System with connected trashcans

Solution Architecture:

There have always been cases of overflowing trash from the bins, causing havoc in the surroundings. With the presence of this waste management system, the user is alerted when the trash can is full, so as to take necessary action. The bin status is sent to a web app through the cloud, which makes real-time monitoring a possible case for the users.



IOT DEVICE:

This project involves the simulation of a connection between two devices:

1.ESP32

2. HC-SR04 Ultrasonic Distance Sensor

1.ESP 32:

The ESP32 is a popular WiFi and Bluetooth-enabled microcontroller, widely used for IoT Projects. ESP32 can perform as a complete standalone system or as a slave device to a host MCU. It can interface with other systems to provide Wi-Fi and Bluetooth.

2.HC-SR04 Ultrasonic Distance Sensor:

The HC-SR04 Ultrasonic Distance Sensor is a sensor used for detecting the distance to an object using sonar. With the help of this sensor, the level of trash filled can be detected by measuring the distance from the lowest point of the trash can against the highest/ last point of the trash can.

These two components are designed in wokwi for stimulation.

IBM WATSON IOT PLATFORM:

BM Watson IoT platform acts as a mediator to connect the web application to the IoT device, so create the IBM Watson IoT platform.

In order to connect the IoT device to the IBM cloud, create a device in the IBM Watson IoT platform and get the device credentials. Configure the connection security and create API keys that are used in the Node-RED service for accessing the IBM IoT Platform.

NODE RED:

Node-Red is used to create a user-friendly web application interface that allows users to visualize gas level data, set alerts, and monitor the system's overall performance.