

## Project Design Phase-II Technology Stack (Architecture & Stack)

|               |   |
|---------------|---|
| Date          | 19 October 2022                                       |
| Team ID       | PNT2022TMID12348                                      |
| Project Name  | Smart Waste Management System for Metropolitan Cities |
| Maximum Marks | 4 Marks   |

### Technical Architecture:

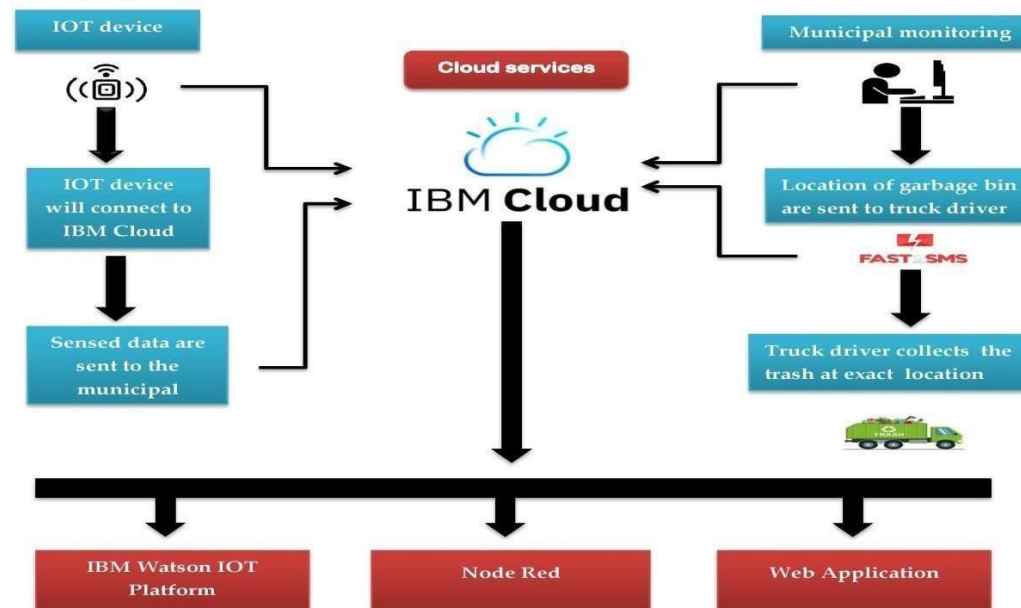


Table-1: Components & Technologies:

| S. No | Component           | Description  | Technology                                 |
|-------|---------------------|--|--|
| 1.    | Arduino Uno         | The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller.                                   | Arduino programming itself is done in C++. |
| 2.    | Application Logic-1 | Logic for IR sensor data.  | C++/Python                                 |
| 3.    | Application Logic-2 | Logic for Ultrasonic sensor data.  | C++/Python                                 |
| 4.    | Application Logic-3 | Logic for a Weight sensor data   | C++/Python                                 |
| 5.    | GPRS/GSM            | The Arduino GSM shield allows an Arduino board to connect to the internet, send and receive SMS, and make voice calls using the GSM library. | C++/Python                                 |
| 6.    | Cloud Sever         | Application deployment on Local System / Cloud   | IBM Watson IoT Platform, Node Red          |
| 7.    | Cloud Database      | Database Service on Cloud  | IBM Watson IoT platform, Cloud ant DB      |
| 8.    | User Interface      | How user interacts with application to alert the truck driver.   | HTML, CSS, JavaScript, Python etc.         |
| 9.    | External API-1      | Purpose of External API used in the application to locate the trashcans.   | Google Maps Geolocation API                |

**Table-2: Application Characteristics:**

| S. No | Characteristics             | Description  | Technology                                     |
|-------|-----------------------------|--|--|
| 1.    | Open-Source Microcontroller | Arduino Uno is used to make the IoT device                 | C++/Python                                     |
| 2.    | Security                    | Encryption/Decryption used for security purpose            | GSM/GPRS, Python                               |
| 3.    | Scalable Architecture       | New features can be added.                                 | Node Red                                       |
| 4.    | Availability                | Web application can be accessed from anywhere              | IBM Watson IoT Platform, HTML, CSS, JavaScript |
| 5.    | Performance                 | All truck drivers can access the application at same time. | Cloud ant DB, IBM Watson IoT Platform          |