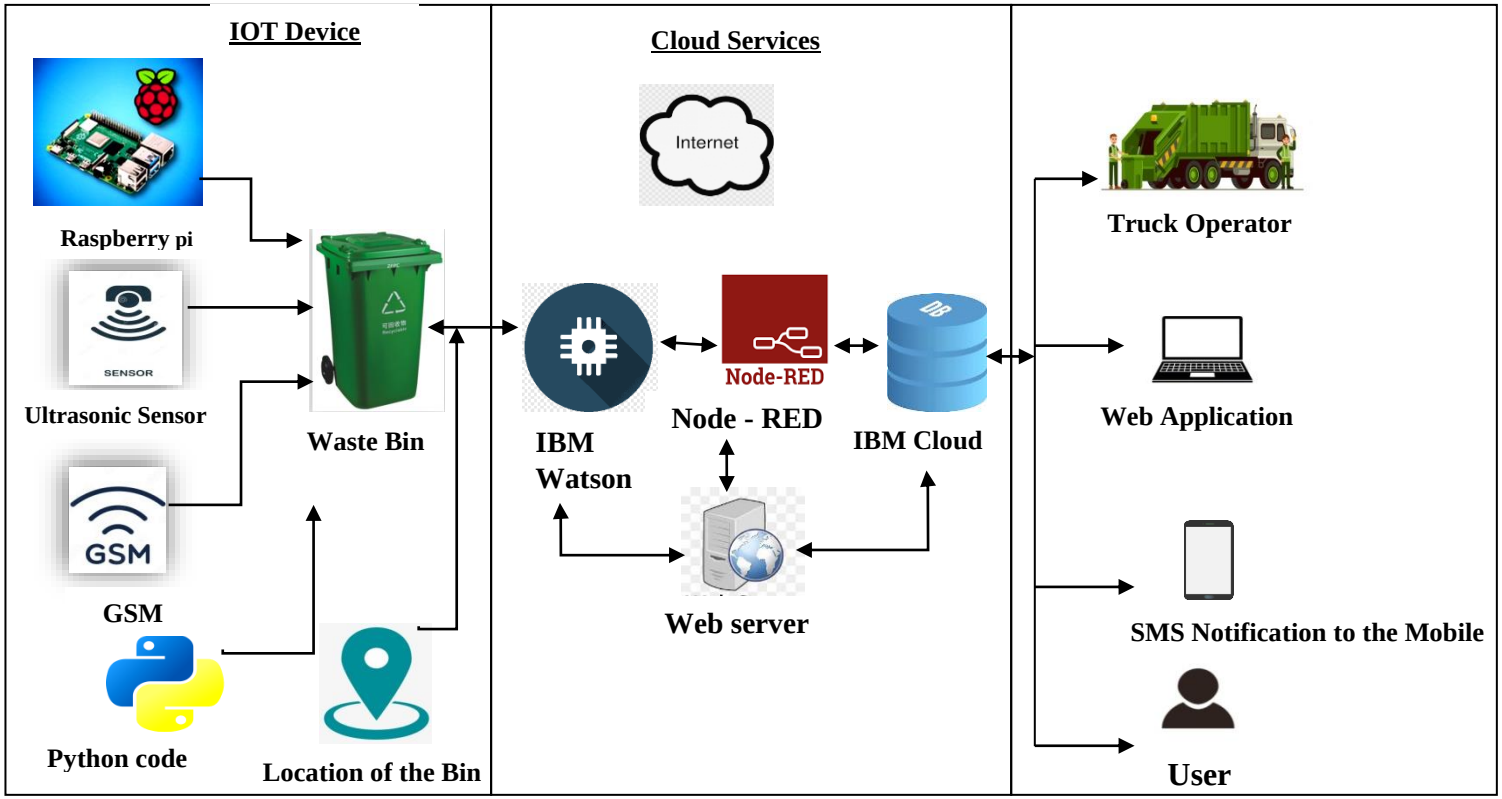
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03October 2022
Team ID	PNT2022TMID38943
Project Name	Smart Waste Management for Metropolitan Cities
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Example: Smart Waste Management for Metropolitan Cities.



Guidelines:

1. Include all the processes (As an application logic / Technology Block)
2. Provide infrastructural demarcation (Local / Cloud)
3. Indicate external interfaces (third party API's etc.)
4. Indicate Data Storage components / services
5. Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web application, mobile SMS	HTML, C , JavaScript, Node Red, GSM etc.
2.	Application Logic-1	To calculate the distance of garbage in the waste bin and show the level in the web application. Sensor is used to measure the level of bin.	Ultrasonic sensor / Python
3.	Application Logic-2	Raspberry pi (or) Arduino UNO is used for performance of sensor and send the data to web application.	Raspberry pi/Arduino UNO
4.	Application Logic-3	Getting the location of waste bin show the web application	GSM/GPS
5.	Database	Real time hosting of database, all the bin informations	NoSQL
6.	Cloud Database	Bin data stored by using cloud database	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Firebase is a set of hosting services for any type of application. It offers NoSQL and real-time hosting of databases, content, notifications, such as a real time communication server.	Firebase
9.	Distance Recognition Model	To send alert message to municipality member, when garbage bin is full.	Distance Recognition/GSM.
10.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Local host Cloud Server Configuration : Local host, fire base,MQTT	Local host, cloud, web application.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node Red, python, IBM cloud	Python ide or python Flask, IOT
2.	Security Implementations	The bin data shared in broadcast, further security measures are used, such as encryption and firewall	Encryptions, firewall
3.	Scalable Architecture	Raspberry pi: specifications CPU: 32-bit computer with a 1GHZ ARMv6 RAM: 512MB Networking: WI-FI Bluetooth: Bluetooth Low Energy (BLE). Storage: Micro SD GPIO: 40-pin GPIO header Ports: micro HDMI 2.0,2 x USB 2.0,Ethernet.	IOT
4.	Availability	These bins have sensors to send alert message about the level of bin to the authorized person available in all the time.	IOT
5.	Performance	Number of request: RPI manages to execute 129-139 read request per second. Use of cache: 512mb Use of CDN's: Real time	IOT/web application