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

Date	29 October 2022
Team ID	PNT2022TMID20530
Project Name	Project - Smart Waste Management System For Metropolitan Cities
Maximum Marks	4 Marks

Technical Architecture:

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web Portal	HTML, CSS, NodeRed, Javascript
2.	Application Logic-1	To calculate the distance of the dreck and show the real-time level in the web portal, information getting via ultrasonic sensor and the alert message activate with a python script to the web portal.	Ultrasonic sensor/ Python.
3.	Application Logic-2	To calculate the weight of the garbage and show the real-time weight in the web portal, this info getting via the load cell and the alert message activate with python to the web portal.	Load cell/Python.
4.	Application Logic-3	Getting the location of the Garbage.	GSM / GPS.
5.	Cloud Database.	Database Service on Cloud	IBM DB2, IBM Cloudant etc.

6.	File Storage	File storage requirements	GitHub, Local file system.
7.	External API1.	Firebase is a set of hosting services for any type of	Firebase.
		application. It offers NoSQL and real-time hosting of databases, content, social authentication, notifications, or services, such as a real-time communication server.	
8.	Ultrasonic Sensor.	To throw an alert message when garbage is getting full.	Distance Recognition Model.
9.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: localhost Cloud Server Configuration: localhost, Firebase.	Localhost, Web portal.

Table 2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	NodeRed, Python, IBM Simulator.	IoT
2.	Security Implementations	Raspberry Pi is connected to the internet and for example, used to broadcast live data, further security measures are recommended, and use the UFW(uncomplicated Firewall).	IoT
3.	Scalable Architecture	Raspberry pi: Specifications Soc: rapid ZERO W CPU: 32-bit computer with a 1 GHz ARMv6 RAM: 512MB Networking: Wi-Fi Bluetooth: Bluetooth 5.0, Bluetooth Low Energy (BLE). Storage: MicroSD GPIO: 40-pin GPIO header, populated	IoT
		Ports: micro HDMI 2.0, 3.5mm analog audio-video jack, 2x USB 2.0, 2x USB 3.0, Ethernet Dimensions: 88mm x 58mm x 19.5mm, 46g	
4.	Availability	These smart bins use sensors like ultrasonic and load cells to send an alert message about the trash level recognition technology, and artificial intelligence, enabling them to automatically sort and categorize recycling litter into one of their smaller bins.	IoT.
5.	Performance	Several requests: RPI manages to execute 129139 read requests per second. Use of Cache:512MB Use of CDNs: Real-time	IoT/Web portal.