

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

Date	19 October 2022
Team ID	IBM-Project-6269-1658825588
Project Name	Smart Waste Management System For Metropolitan Cities
Maximum Marks	4 Marks

**Technical Architecture :**

**Table -1: Components & Technologies**

S.No	Components	Description	Technology
1.	User Interface	Web Portal	HTML,CSS,NodeRed, Javascript.
2.	Application Logic-1	To calculate the distance of dreck and show the real time level in web portal , information getting via ultra sonic sensor and the alert message activate with python script to web portal.	Ultrasonic sensor/ Python.
3.	Application Logic-2	To calculate the weight of the garbage and show the real time weight in web portal, this info getting via load cell and the alert message activate with python to web portal.	Load cell/Python
4.	Application Logic-3	Getting 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 API-1	Firestore is a set of hosting services for any type of application	Firebox.

		It offers NoSQL and real-time hosting of databases, content, social authentication, and notifications, or services, such as a real-time communication server.	
8.	Ultrasonic Sensor.	To throw alert message when garbage is getting full. Distance Recognition Model.	Distance Recognition Model.
9.	Infrastructure (Server/Cloud).	Application Deployment on Local System / Cloud Local Server Configuration: localhost Cloud Server Configuration: localhost, Firebox	Localhost, Web portal.

**Table-2: Application Characteristics:**

S No	Characteristics	Description	Technology
1.	Open -Source Framework	NodeRed,Python,IBM Simulator.	IoT.
2.	Security Implementation	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: rspi ZERO W CPU: 32-bit computer with a 1 GHz ARMv6 RAM: 512MB	IoT.

		<p>Networking: Wi-Fi</p> <p>Bluetooth: Bluetooth 5.0, Bluetooth Low Energy (BLE).</p> <p>Storage: MicroSD</p> <p>GPIO: 40-pin GPIO header, populated</p> <p>Ports: micro HDMI 2.0, 3.5mm analogue audiovideo jack, 2x USB 2.0, 2x USB 3.0, Ethernet</p> <p>Dimensions: 88mm x 58mm x 19.5mm, 46g</p>	
4.	Availability	These smart bins use sensors like ultrasonic and load cell to send alert message about the trash level recognition technology, and artificial intelligence, enabling them to automatically sort and categorize recycling litter into one of its smaller bin.	lot.
5.	Performance	<p>Number of request:RPI manages to execute 129-139 read requests per second.</p> <p>Use of Cache:512mb</p> <p>Use of CDN's:Real time</p>	lot/web portal.