

## Project Design Phase-II

### Technology Stack (Architecture & Stack)

Date	31 October 2022
Team ID	PNT2022TMID47456
Project Name	Smart waste management system.
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.	ApplicationLogic-1	To calculate the distance of bin location and show the real-time level in the web portal, information getting via ultrasonic sensor and the alert message activates with a python script to the web portal.	Ultrasonic sensor/Python.
3.	ApplicationLogic-2	To calculate the weight of the garbage and show the real-time weight in the web portal, this info getting via load cell and the alert message activate with python to web portal.	Load cell/Python.
4.	ApplicationLogic-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 API-1.	Firestore is a set of hosting services for any type of application. It offers NoSQL and real-time hosting of databases, content, social authentication, notifications, or services, such as a real-time communication server.	Firestore.
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: local host Cloud Server Configuration: local host ,Firestore.	Local host, Web portal.

**Table 2: Application Characteristics:**

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node Red, 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: rsi 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 Ports: micro HDMI 2.0, 3.5mm analogue audio-video jack, 2x USB 2.0, 2x USB 3.0, Ethernet Dimensions: 88mm x 58mm x 19.5mm, 46g	IoT
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 its smaller bins.	IoT.

5.	Performance	Many requests: RPI manages to execute 129-139 read requests per second. Use of Cache:512MB Use of CDNs: Real time	IoT/Web portal.
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