Project Design Phase-II

Technology Stack (Architecture & Stack)

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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.	User Interface	Web Portal	HTML,CSS ,NodeRed, Javascript, (Front End Development) Framework--Boot strap Server side-- PHP,MYSQL
2.	Application Logic-1	i)To calculate the distance of dreck(trash) and show the real time level of the trash in web portal and the information will be getting via ultra sonic sensor ii)The alert message activate with python script to web portal.	Ultrasonic sensor and Python is the technology used in application logic-1
3.	AP-2	i)To calculate the weight of the garbage and show the real time weight in web portal, this info getting via load cell	Load cell and Python is the technology used in application logic-2

4.	AP-3	Getting location of the Garbage via the Global Positioning System or GSM technology	Global Positioning System and Global System Mobile Communication
5.	Cloud Database	Database Service on Cloud	IBM Data Base 2, IBM Cloud Services (Saas,Paas,Iaas)
6.	File Storage	File storage requirements	Git Hub, Local filesystem.
7.	External API-1.	Firebase is a set of hostingservices for any type of application. It offers NoSQL andreal-time hosting of databases, content, social authentication, and notifications, or services, such as a real-time communication server.	Firebase.

8.	Ultrasonic Sensor.	To throw alert message when garbage is getting full.	Distance Recognition Model.
9.	Infrastructure (Server / Cloud)	Application Deployment on LocalSystem / Cloud Local Server i)Configuration: localhostCloud Server ii)Configuration: localhost, Firebase.	Localhost, Web portal.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node Red, Python, IBMSimulator.	Internet Of Things
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 theUFW(uncomplicated Firewall).	Internet Of Things
3.	Scalable Architecture	Raspberry pi: Specifications Soc : rspi 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	Internet Of Things

4.	Availability	The smart bins will be 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.	Internet Of Things
5.	Performance	Number of request: RPI manages to execute 129-139 1 read requests per second. Use of Cache:512mb Use of CDN's :Real time	Internet Of Things and Web portal.