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

Date	03 October 2022
Team ID	PNT2022TMID04593
Project Name	Project –Smart Waste Management system for Metropolitan cities
Maximum Marks	4 Marks

Technical Architecture:

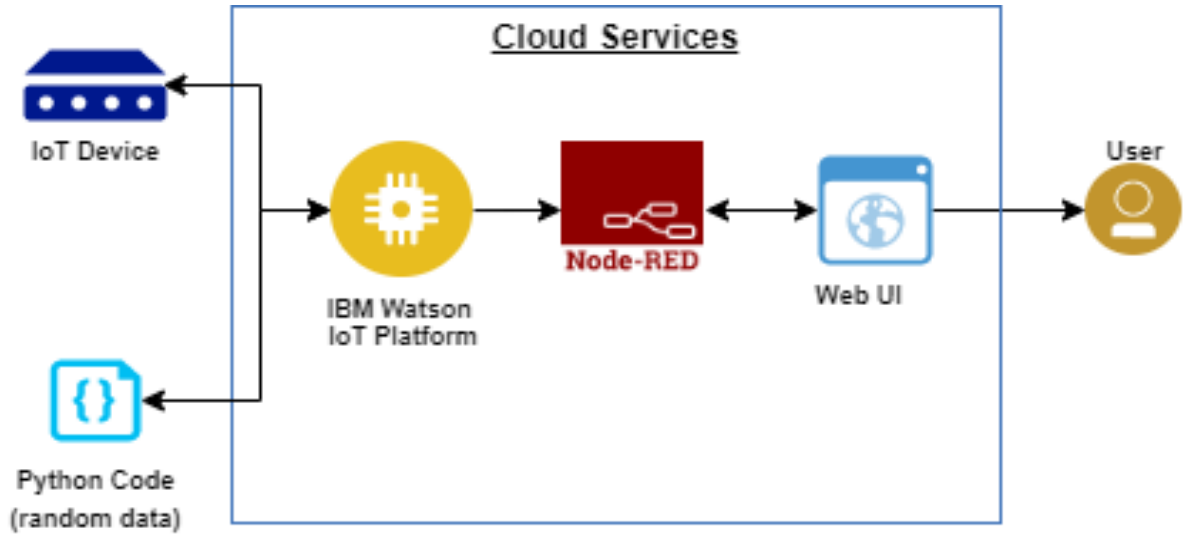

Table- 1: Components & Technologies:

S. No	Component	Description	Technology
1.	User Interface	IBM Watson IOT cloud platform	MQTT protocol
2.	Application Logic-1	Bin level status are collected by sensors	Python
3.	Application Logic-2	Data are Monitored by IOT	IBM Watson STT service
4.	Application Logic-3	Based on the level the message is send to the trash collectors to clear the Wastes	IBM Watson Assistant
5.	Database	MySQL- It is database to collect the data NoSQL-It is an approach to database design that enables the storage and querying of the data outside the traditional structures found in relational database.	MySQL, NoSQL
6.	Cloud Database	It will receive the real time updates from all the garbage bins and continuously display it on the web application and also send notification to the receiver. Using mobile application.	IBM DB2, IBM Cloudant
7.	File Storage	It is an easy way to back up and quick recovery to collect the old data.	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	External API is exposing a projects internal resource to the outside users.	IBM Weather API, etc.
9.	External API-2	It is used to allow you to access the third party.	Aadhar API, etc.
10.	Machine Learning Model	It is used to track the bin and collect the wastes in proper manner.	Python IDLE, Anaconda navigator or Jupiter.
11.	Infrastructure (Server / Cloud)	Server: In computing, information technology infrastructure is composed of physical and virtual resources that support the flow, storage, processing and analysis of data. Cloud: It includes computing power, networking, and storage, as well as an interface for users to access their virtualized resources.	Cloud - MySQL server-HTTP

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Real time monitoring system is used in bins and it will notify the fill level and give notification to the receiver in a locality or city at all times.	Technology of Open source framework
2.	Security Implementations	Encryption/Decryption used for security purpose	GSM/GPRS, Python
3.	Scalable Architecture	New features can be added.	Node Red
4.	Availability	Web application can be accessed from anywhere	IBM Watson I0T Platform, HTML, CSS, JavaScript
5.	Performance	All can access the application at same time.	Cloudant DB, IBM Watson IOT Platform