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

Date	19 Septemper 2022
Team ID	PNT2022TMID26599
Project Name	Project - Smart Waste Management System For Metropolitan Cities
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Example: Order processing during pandemics for offline mode

Reference: https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/

Table-1 : Components & Technologies:

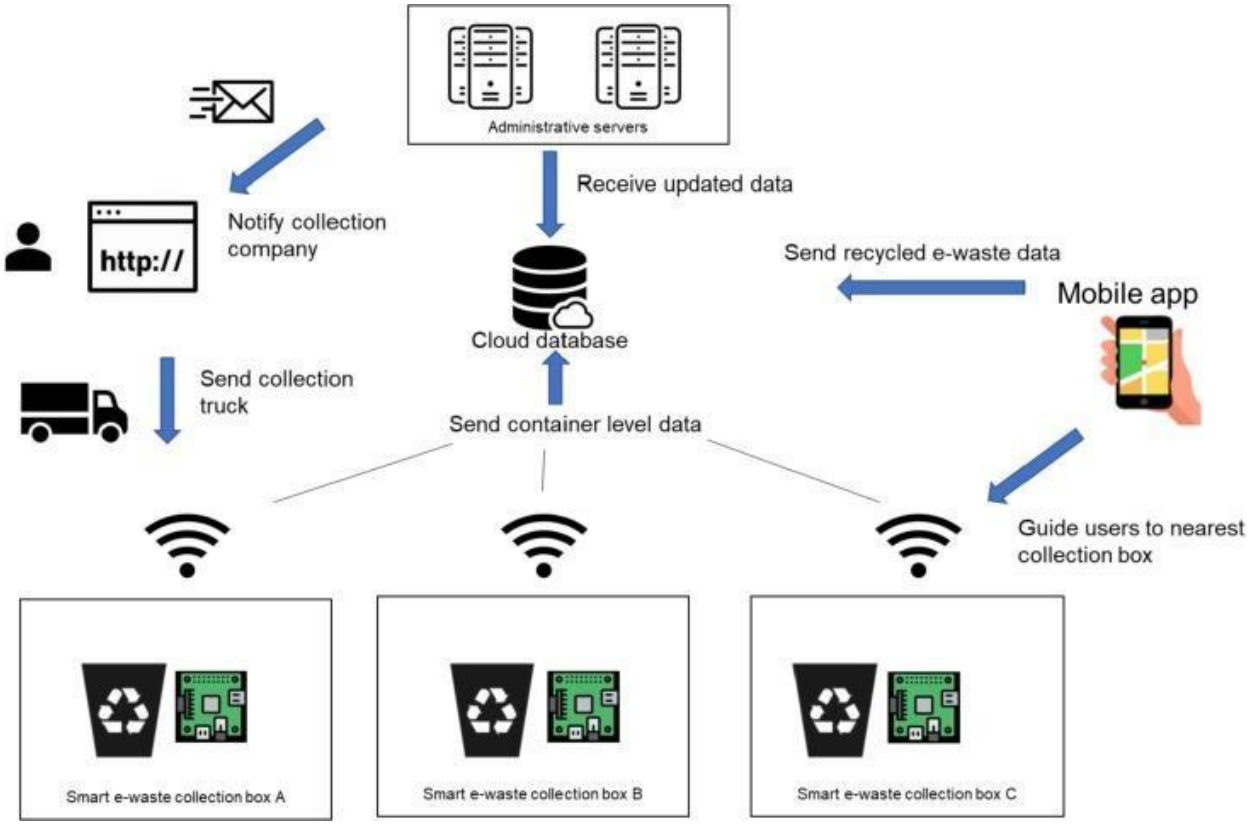
S. No	Component	Description	Technology
1.	User Interface	IBM Watson IOT cloud platform	MQTT Protocol
2.	Application Logic-1	The bin waste data's are collected using sensors	Python
3.	Application Logic-2	The collected data's are monitored using IOT	IBM Watson STT service
4.	Application Logic-3	Based on data's the alerting message will send to the workers for disposing the wastes.	IBM Watson Assistant
5.	Database	✓ MySQL is a relational database that is based on a tabular design. ✓ NoSQL is non-relational and has a document-based design.	MySQL, NoSQL

6.	Cloud Database	This module will continuously display real-time status updates from all the trash cans on the web application and provide client-side notifications (Municipal Corporation, Garbage collector truck drivers etc.) mobile \sapplication	IBM DB2, IBM Cloud
7.	File Storage	File backup and recovery are made simple by data storage in the case of an unanticipated computer failure or cyberattack. Data storage makes it easy to back up files for safekeeping and quick recovery in the event of an unexpected computing crash or cyberattack.	IBM Block Storage or Other Storage Service
8.	External API-1	External APIs expose a project's internal resources to outside users or applications	IBM Weather API, etc.
9.	External API-2	External API allow you to access third party resources that are available through RESTful web services	Aadhar API, etc.
10.	Machine Learning Model	The proper algorithm makes planning good. It will direct the good character, the best course of action, and the first garbage can to be collected.	Python IDLE or Anaconda navigator or Jupitar
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Cloud Server Configuration: Cloud deployment is the process of deploying an application through one or more hosting models—software as a service (SaaS), platform as a service (PaaS) and or infrastructure as a service (IaaS) that leverage the cloud Local Server Configuration : A local server gives you exclusive access to data and objects in a set of Windows folders called data directories	Cloud server- MySQL Local server-HTTP

Table-2: Application Characteristics:

S. No	Characteristics	Description	Technology
1.	Open-Source Frameworks	✓ Transport, treatment, and disposal of waste together with monitoring and regulation. ✓ It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling."	Python
2.	Security Implementations	✓ Fundamental component of data security that dictates who's allowed to access and use company information and resources. ✓ Firewalls use a rule-based access control model with rules expressed in an access control list.	Firewall
3.	Scalable Architecture	Using smart waste bins, reduce the number of bins inside town and cities because that we can able to monitor the garbage 24/7.It will be more cost efficient and scalable when we moves to smarter.	Technology used
4.	Availability	By developing & deploying resilient hardware and beautiful software we empower cities, businesses, and countries to manage waste smarter.	IOT, RFID
5.	Performance	✓ The Smart Sensors use ultrasound technology to measure the fill levels (along with other data) in bins several times a day. ✓ Using a variety of IoT networks ((NB-IoT, GPRS), the sensors send the data to Sensor's Smart Waste Management Software System, a powerful cloud-based platform, for data-driven daily operations, available also as a waste management app.	IOT, GPRS

TECHNOLOGY ARCHITECTURE:



References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture

https://aws.amazon.com/architecture

https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d