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

Date	03 October 2022
Team ID	PNT2022TMID37162
Project Name	Smart Waste Management System for Metropolitan System
Maximum Marks	4 Marks

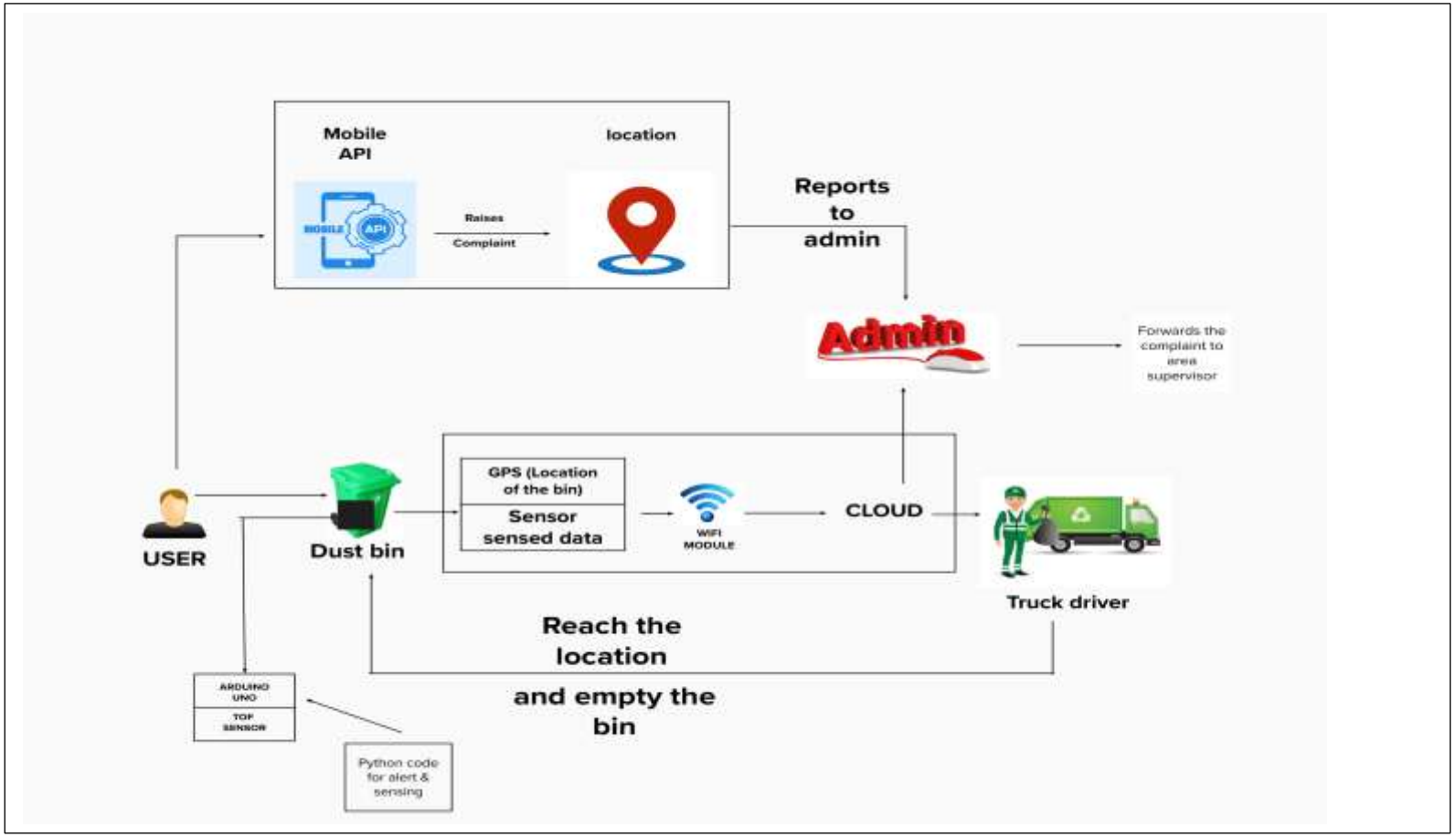

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web Application for admin to monitor and manage all details	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	View all the bin locations	GPS
3.	Application Logic-2	View the level of all the bins in that area	ToF Sensor
4.	Application Logic-3	Receive complaints from the user on wastes overflow with the location of that user.	GPS , Nearest bin finding from that location.
5.	Network	All the data of bin level , location are sent to cloud using fast network connectivity	LoRaWAN
6.	Cloud Database	Database Service on Cloud	IBM Cloud
7.	File Storage	Store all previous past data to cloud .	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Sensor application for sensing the level of the bin	Sensor
9.	External API-2	Receive complaints from an application built for the users to raise a complaint if wastes are spread on the roads.	GPS (for location), Shortest path finding algorithm to assign staff
10.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Node Red , Python , IBM Cloud	Internet-of-Things(IoT)
2.	Security Implementations	Data is fully transferred over internet (no firewalls are implemented may be used if needed for security reasons)	IoT
3.	Scalable Architecture	Arduino UNO board , Sensor for sensing the bin level , GPS module , LoRaWAN for transferring data to cloud .	IoT
4.	Availability	This smart bins uses the components that are easily available in the market and in low cost .	IoT
5.	Performance	Use of cache:512 MB Use of CDN's : Good and Enough Speed for this system Number of Request per minute:-90-100	IoT