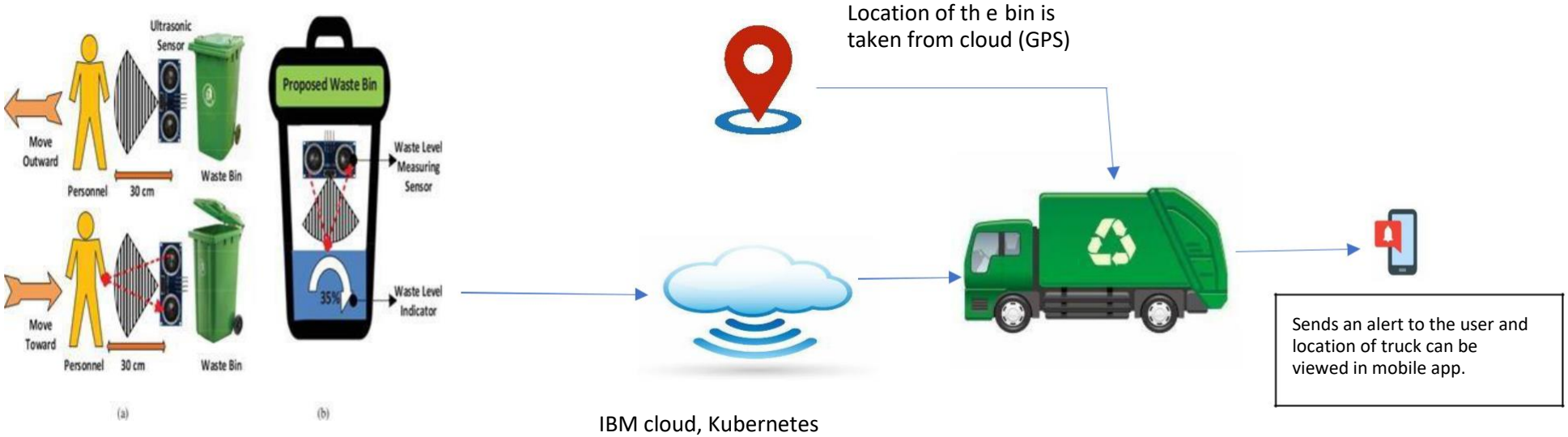
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	16 Novenber 2022
Team ID	PNT2022TMID06036
Project Name	Smart waste management in metropolitan cities
Maximum marks	4 marks

Technical Architecture:

Monitoring the waste bin using the **ultrasonic sensors**



(Data secured by firewalls)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	The user interacts with application with Web UI	HTML, CSS, JavaScript etc.
2.	Application Logic-1	To trace the truck, to locate the bin and to show the trash level in the bin (i.e) the data from the ultrasonic sensor and alert through the mobile application	Java / PHP
3.	Database	Data Type, Configurations etc.	MySQLetc.
4.	Cloud Database	Database Service on Cloud	IBM Cloudant etc.
5.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
6.	Ultransonic sensor	Monitors the trash level in bin	Distance recognition model
7.	External API-1	API is used to fetch the data of the trash bin	API
8.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Local host Cloud Server Configuration : IBM cloud	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	NodeRed, Python, IBM simulator	PHP

2.	Security Implementations	Request authentication using Encryptions and Firewall for network security to secure the data of the user.	Encryptions and decryptions
3.	Scalable Architecture	Scalability consists of 3 tier architecture	Database server: IBM cloud. IBM Kubernetes provide better accuracy.
S.No	**Characteristics**	**Description**	**Technology**
			Web Server: HTML, CSS, Javascript Application server: PHP
4.	Availability	Available for all cloud users and Municipality department of the city. They can access through mobile application	IBM cloud hosting, Android or IoS
5.	Performance	Performance can be increased by Analysing data and through machine learning	Machine learning