Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	03 October 2022
Team ID	PNT2022TMID22430
Project Name	Project – Smart waste management for metropolitan cities
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	GPS and Cloud	GPS location of the registered bin to be received. The data collected is to be stored in cloud. So cloud registration must be done.
FR-4	Bin details and its monitoring	The data about the bin is collected- The size, the capacity, the type of waste it holds, the time it takes approximately to get filled etc. Displays real-time data on fill-levels of bins monitored by smart sensors. With real-time data and predictions, you can eliminate the overflowing bins and stop collecting half-empty ones.
FR-5	Plan waste collection routes	Based on current bin fill-levels and predictions of reaching full capacity, you are ready to respond and schedule waste collection. Inefficient picks are thus avoided
FR-6	Bin distribution	Identify areas with either dense or sparse bin distribution. Based on the data collected on capacity or location, the bin can be adjusted, if necessary.

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	IoT device verifies and analyses user requirements, which can further improve the design quality. In the design process, with user experience as the core knowledge, usability can indeed help designers better understand users' potential needs in waste management, behaviour and experience.

NFR-2	**Security**	Use reusable bottles Use reusable grocery bags Purchase wisely and recycle Avoid single use food and drink containers
NFR-3	**Reliability**	Smart waste management is also about creating better working conditions for waste collectors and drivers. Instead of driving the same collection routes and servicing empty bins, waste collectors will spend their time more efficiently, taking care of bins that need servicing
NFR-4	**Performance**	The Smart Sensors use ultrasound technology (ultrasonic sensor) to measure the fill levels in bins several times a day and saved in cloud which helps in performing many data driven operations in waste management app. Customers are hence provided with data-driven decision making, and optimization of waste collection routes, frequencies, and vehicle loads resulting in route reduction by at least 30%
NFR-5	**Availability**	By developing & deploying effective hardware and apt software we can empower cities to manage waste smarter
NFR-6	**Scalability**	Using smart waste bins, reduces the number of bins inside town or cities because we able to monitor the garbage 24/7 more cost effect and scalability when we move to smarter.