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

Date	11 October 2022
Team ID	PNT2022TMID47771
Project Name	SMART WASTE MANAGEMENT SYSTEM
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	Detailed bin inventory.	On the map, you can see every monitored bin and stand, and you can use Google Street View at any time to visit them. On the map, bins or stands appear as green, orange, or red circles. The Dashboard displays information about each bin, including its capacity, trash kind, most recent measurement, GPS location, and pick-up schedule.
FR-2	Real time bin monitoring.	The Dashboard shows data on the amount of fill in bins as it is being tracked by smart sensors. The application also forecasts when the bin will be full based on past data, which is one of the capabilities that even the greatest waste management software does not offer. As picks are also recognised by the sensors, you can determine when the bin was last emptied. You can get rid of the overflowing bins and cease collecting half-empty ones with real-time data and predictions.
FR-3	Expensive bins.	We assist you in locating containers that increase collection prices. The tool determines a collection cost rating for each bin. The tool takes local average depo-bin discharge into account. The tool determines the distance from depo-bin discharge and rates bins (1–10).
FR-4	Adjust bin distribution.	Ensure the best possible bin distribution. Determine which regions have a dense or sparse distribution of bins. Ensure that each form of waste has a representative stand. You can make any necessary adjustments to bin position or capacity based on past data.
FR-5	Eliminate unefficient picks.	Get rid of the collection of half-empty trash cans. Picks are recognised by sensors. We can demonstrate to you how full the bins you collect are using real-time data on fill-levels and pick recognition. The report details the bin's initial level of brimmingness. Any picks below 80% full that are inefficient are seen right away.

FR-6	Plan waste collection routes.	Route planning for rubbish pickup is semi-automated using the tool. You are prepared to act and arrange for garbage collection based on the levels of bin fill that are now present and forecasts of approaching capacity. To find any discrepancies, compare the planned and actual routes.

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 that usability is a special and important perspective to analyze user requirements, which can further improve the design quality. In the design process with user experience as the core, the analysis of users' product usability can indeed help designers better understand users' potential needs in waste management, behavior and experience.
NFR-2	**Security**	Utilize recyclable bottles. Utilize reusable shopping bags. Spend responsibly and recycle Don't consume food or drink in single-use containers.
NFR-3	**Reliability**	Creating better working conditions for waste collectors and drivers is another aspect of smart waste management. Waste collectors will use their time more effectively by attending to bins that require service rather than travelling the same collection routes and servicing empty bins.
NFR-4	**Performance**	The Smart Sensors assess the fill levels in bins (along with other data) numerous times per day using ultrasound technology. The sensors transmit data to Smart Waste Management Software System, a potent cloud-based platform with data-driven daily operations and a waste management app, using a range of IoT networks (NB-IoT, GPRS). As a result, customers receive data-driven decision-making services, and waste collection routes, frequency, and truck loads are optimized, resulting in at least a 30% reduction in route length.
NFR-5	**Availability**	By creating and implementing robust hardware and gorgeous software, we enable cities, companies, and nations to manage garbage more intelligently.
NFR-6	**Scalability**	Because we can monitor the garbage around-the-clock and scale up when we utilize smarter bins, we can use fewer bins inside of towns and cities.