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

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Team ID	PNT2022TMID38381
Project Name	Project - **Smart Waste Management System For Metropolitan Cities**

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**	All monitored boxes and stands may be visible at the map, and you could go to them at any time through the Street View characteristic from Google. Bins or stands are seen at the map as green, orange or crimson circles. You can see bin details within the Dashboard – potential, waste kind, ultimate size, GPS place and series agenda or pick out reputation.
FR-2	**Pristine 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-3	**The distribution of the bins.**	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-4	**Real-time bin surveillance.**	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 eliminate the overflowing bins and cease collecting half-empty ones with real-time data and predictions.
FR-5	**Routing the pickup of trash**	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.
FR-6	**Get rid of ineffective picks**	Get rid of the collection of half-empty trash cans. Picks are recognised by sensors. We are able to show you how filled the bins you collect are by utilizing 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.

<u>Non-functional Requirements:</u>

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Usability is a unique and significant perspective to examine user requirements, which can further enhance the design quality, according to IoT devices. The study of customers' product usability can help designers better understand users' possible demands in waste management, behavior, and experience during the design

		process, which places a focus on the user 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 empty bins that need service rather than driving the same collection routes.
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 feed data to Sensoneo's Smart Waste Management Software System, a robust cloud-based platform with data-driven daily operations and a waste management app, using a variety 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 durable hardware and gorgeous software, we enable cities, companies, and nations to manage garbage more intelligently.
NFR-6	**Scalability**	Using smart waste bins allows us to scale up and monitor the garbage more efficiently while also reducing the number of bins needed in towns and cities.