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

Date	16/11/2022
Team ID	B10-4A6E
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.	All monitored bins and stalls are displayed on a map and can be visited at any time using Google's Street View feature**.** containers or stalls are displayed as green, orange, or red circles on the map**.** You can see bin details on the dashboard - capacity, waste type, last reading**,** GPS location, pick-up schedule or pick-up detection**.**
FR-2	Real time bin monitoring.	The dashboard shows real-time data on container filling levels monitored by intelligent sensors. In addition to filling percentage, this tool also predicts when the bin will fill up based on historical data. This is he one of the features that even the best waste management software doesn't have. The sensor also detects drawers. This allows you to see when the bin was last picked up. Real-time data and predictions can eliminate overflowed bins and stop half-empty collections.

FR-3	Expensive bins.	We can help you identify the containers that are driving up your collection costs. This tool calculates a score in terms of collection costs for each bin. This tool takes into account the average distance from the depot to emptying containers in the region. This tool assigns a rating (1-10) to the bins and calculates the distance to empty the depot bins.
FR-4	Adjust bin distribution.	Ensures optimal distribution of containers. Identify regions with dense or sparse bin distributions. Make sure all types of waste are displayed within the stand. You can adjust bin capacity or location as needed based on historical data.
FR-5	Eliminate unefficient picks.	Eliminate the collection of half-empty bins. Sensor detected a pick. Real-time fill level and pick detection data can be used to show how full the bins you collect are.
		The report shows how full the bins were when they were ejected. Instantly see inefficient picking under 80% utilization
FR-6	Plan waste collection routes.	This tool performs semi-automatic garbage collection root planning. Waste collection can be responded to and scheduled based on current bin levels and predictions of when full capacity will be reached. You can compare planned and executed routes to identify discrepancies.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	IoT devices make sure that usability is a special and important perspective for analyzing user requirements, which can further improve the design quality. In a design process with user experience at its core, analyzing product usability helps designers better understand potential user needs in terms of waste management, behavior, and experience.
NFR-2	**Security**	Use reusable bottles Use reusable plastic bags Shop smart and recycle Avoid single-use food and drink containers
NFR-3	**Reliability**	Intelligent waste management also means creating better working conditions for waste collectors and drivers. Garbage collectors spend their time tending bins that need more efficient servicing instead of following the same collection route to service empty bins.
NFR-4	**Performance**	The smart sensor uses ultrasonic technology to measure (among other things) the level in the container several times a day. Using various IoT networks (NB-IoT, GPRS), the sensors transmit data to Sensoneo's Smart Waste Management Software System, a powerful cloud-based waste management software for data-driven daily operations. It is a platform and can also be used as a waste management app, thus providing data-driven decision-making and optimization of waste collection routes, frequency and vehicle load, reducing routes by at least 30%.

NFR-5	**Availability**	We help cities, businesses and countries manage their waste smarter by designing and delivering robust hardware and beautiful software.
NFR-6	**Scalability**	Smart bins reduce the number of bins in cities as they can be monitored
		Migrating to Garbage 24/7 Smarter is cost effective and scalable**.**