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Project Design Phase-II

Solution Requirements (Functional & Non-functional)

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Date	03 October 2022
Team ID	PNT2022TMID42593
Project Name	Smart Waste Management Systems in 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	Detailed bin Inventory	* By using Street view Features from google we can visit and see all monitored Trash cans and stands which can be seen on the map. *You can see bin details in the Dashboard – capacity, waste type, last measurement, GPS location and collection schedule or pick recognition.
FR-2	Bin Monitoring	*The Dashboard shows the actual data on fill-levels of bins monitored by Sensors. *Sensors recognize picks as well; so you can check when the bin was last collected. *With real-time data and predictions, you can eliminate the overflowing bins and stop collecting half-empty ones.
FR-3	Expensive bins	We help you identify bins that drive up your collection costs. The tool calculates a rating for each bin in terms of collection costs. The tool considers the average distance bin discharge in the area. The tool assigns bin a rating (1-10) and calculates distance from bin discharge.
FR-4	Adjusted bin distributions	Ensure the most optimal distribution of bins. Identify areas with either dense or sparse bin distribution. Make sure all trash types are represented within a stand. Based on the historical data, you can adjust bin capacity or location where necessary.
FR-5	Eliminate unefficient picks	*It eleiminates the half empty bins by recognizing from sensor *Monitored by Raspberry Pi camera with 12 MP and high resolution of upto 1080p is used.

		*By using real-time data on fill-levels and pick recognition, we can show you how full the bins you collect are.

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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**	1. Use a reusable bottles 2. Use reusable grocery bags 3. Compost it 4. Purchase wisely and recycle 5. Avoid using use and throw 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 to measure the fill levels (along with other data) in bins several times a day. Using a variety of IoT networks (NB-IoT,GPRS), the sensors send the data to Sensoneo's Smart Waste Management Software System, a powerful cloud-based platform, for datadriven daily operations, available also as a waste management app. Customers are hence provided 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 resilient hardware and beautiful software we empower cities, businesses, and countries to manage waste smarter.
NFR-6	**Scalability**	Using smart waste bins reduce the number of bins inside town and cities because we are able to monitor the garbage 24/7 more cost effectively and scalability is high.