

Functional Requirements

Team ID	PNT2022TMID05622
Project Name	Smart Waste Management for Metropolitan Cities
Maximum marks	4 marks

Functional Requirements:

FR. No	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Detailed bin inventory.	The map shows all monitored bins and stands, and Street View from Google can be used to visit them at any time. Bins are shown as green, orange or red circles. The Dashboard shows bin details, such as waste type and last measurement. You can see in detail in the Dashboard – capacity, waste type, last measurement, GPS location and collection schedule or pick recognition.
FR-2	Realtime bin monitoring.	Aside from displaying real-time data on fill levels of bins monitored by smart sensors, the Dashboard also predicts when the bin will be full based on historical data, which is one of the most useful features. Sensors recognize picks as well; so you can check when the bin was last collected. With real-time data and predictions, you can eliminate 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 depo-bin discharge in the area. The tool assigns the bin a rating (1-10) and calculates the distance from the depo-bin discharge.
FR-4	Adjust bin distribution.	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 inefficient picks.	Eliminate the collection of half-empty bins. The sensors recognize picks. By using real-time data on fill levels and pick recognition, we can show you how full the bins you collect are.
FR-6	Plan waste collection routes.	The tool semi-automates waste collection route planning. Based on current bin fill levels and predictions of reaching full capacity, you are ready to respond and schedule waste collection. You can compare planned vs. executed routes to identify any inconsistencies.

Non - Functional Requirements:

NFR 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, 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 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 Sansone's Smart Waste Management Software System, a powerful cloud-based platform, for data-driven 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 reduces the number of bins inside the town, and cities coz we are able to monitor the garbage 24/7 more cost effect and scalability when we move to smarter