

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

Date	26 October 2022
Team ID	PNT2022TMID47365
Project Name	Smart Waste Management System for 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	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Bin Invention	The proposed model provides real time monitoring to thegarbage bins placed in various location. You can see every monitored bin and stand, and you canuse google street view at any time to visit them.
FR-4	Bin Monitoring	The Garbage bins are monitored by smart sensors. the application also forecasts when the bin will be filled based on the past data and capacity of the bin. The sensor will know when the bin was last emptied. So, you can eliminate overflowing bins and cease collecting the empty ones,
FR-5	Notification	The percentage of garbage level will be detected through sensors. When the garbage level is increased above 75%, it givesnotification to the security team. After receiving the notification, the garbage collector collects the garbage.
FR-6	Optimize the route to collect	Waste collectors will use their time effectively by collecting the wastes which requires service rather than travelling the same routes.
FR-7	Database	Information about the location and status of bins will be stored in the database.
FR-8	Feedback	It helps the developer to improve the apps.

### Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	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	<b>Security</b>	Use reusable bottles Use reusable grocery bags Purchase wisely and recycle Avoid single use food and drink containers
NFR-3	<b>Reliability</b>	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	<b>Performance</b>	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 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	<b>Availability</b>	By developing & deploying resilient hardware and beautiful software we empower cities, businesses, and countries to manage waste smarter.
NFR-6	<b>Scalability</b>	Using smart bins may reduce the number of bins inside the cities because we monitor the garbage 24/7 more efficient.