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

Date	18th October 2022
Team ID	PNT2022TMID47939
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	**Expensive bins**	As we are making up bins with sensors and other costly devices , this is somewhat expensive architecture to built. And so this requires more security settings as it requires more cost if we need to rebuilt it.
FR-2	**Implementing proper monitoring system**	All bins can be seen on the map, and you can visit them at any time via the Street View feature from Google. Bins are visible on the map as green, orange or red circles. You can see bin details in the Dashboard – capacity, waste type, last measurement, GPS location and collection schedule or pick recognition.
FR-3	**Planning waste collection routes**	As well as planning is important where we need to set locations to particularize routes where bins are collected once it got filled. So, clear mapping of routes where the bin collecting truck need to travel. If we all set with clear plan, there is no need of wasting time and fuel by searching locations.
FR-4	**Separation of different kind of wastes**	Separation of different kind of wastes involves people responsibility too and so, proper education need to be provided. And bins should be implemented accordingly in each locations. And especially medical wastes should be disposed in a proper manner.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The current state of technology in the field of smart waste management involves the use of sensors that measure the fill level of the trash bin. Measured data is sent to the Cloud for further processing and analysis. By exploiting this data, trash collection can be planned as well as truck routes can be optimized. IoT device verifies that usability is a special and important perspective to analyse user requirements, which can further improve the design quality

NFR-2	**Security**	Security ensures the level of assurance in data collection, processing and conveying. As this is totally depend upon cloud service we need to make security more particular without channel crash.
NFR-3	**Reliability**	Smart waste management is also about creating better working conditions for waste collectors. Instead of driving the same collection routes and servicing empty bins, waste collectors can spend their time more efficiently, taking care of bins that need servicing. This system is more reliable at any cost by taking care of garbage bins and monitoring bin activity.
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 Sensor'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 provided with required data-driven and decision making prototypes which would help uses to monitor its performance and encounter their quires.
NFR-5	**Availability**	Availability refers to already available solutions and the new renovative technology that we include in the system which we are building new now. This system have much available solutions for users and this made users to operate easily where we have used sensors, GPS detectors, and so on.
NFR-6	**Scalability**	We have to customize the number of bins in the town/city which we are going to monitor 24/7 a week and collect data. So, we need to measure the total bins and avail services to all bins in an proper rotational shifts.