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

Date	27 October 2022
Team ID	PNT2022TMID17949
Project Name	Smart Waste Management 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	Bin Discovery and Information	All the bins and monitored and the location and view of the bins are taken from Google and this information are used to have a detailed inventory of the bins. The details of the bins can be viewed from the dashboard of the web application, which includes information like capacity, location, type of the waste etc.
FR-2	Monitoring of the bins	The data and information available in the dashboard are used to predict the fill-levels of the bins. The randomized values are used for the predictions, and using this feature it makes the users possible to prevent overflowing of the bins.
FR-3	Selection of Bins	The web app gives a detailed description of the costs of the bin and this helps us to identify the types of bins based on our collection costs.
FR-4	Distribution of Bins	It is important to make sure that all the hotspots are equipped with required number of bins to collect the trash. Based on the predictions the bin capacity and location can be adjusted.
FR-5	Managing the Efficiency	Alert to the concerned people will be sent only when the bins reach the threshold value. The half- empty bins do not trigger the alert and hence the work efficiency is maintained.
FR-6	Planning of routes	Based on the predictions made, an efficiency map gives the best route to follow during the emptying of the bins which are filled in different locations.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Interface that is simple and convenient to use. Reduce page load interruptions and improve user experience by using single-page applications.

NFR-2	**Security**	Use password and OTP two-factor authentication for access from authorised users, and add captchas for extra protection.
NFR-3	**Reliability**	The technology relies on sensors to accurately report the amount of trash in bins while removing the need for human interaction.
NFR-4	**Performance**	The web application should load quite quickly, and since the sensor data is gathered and processed remotely in the cloud, good performance is guaranteed.
NFR-5	**Availability**	This smart waste management system continuously and round-the-clock monitors smart bins. The deployment of any upcoming new modules for the web application can happen without interfering with the functionality of other pages. A timer will be displayed if the system is unavailable during the deployment of a new module to show when it will be available again.
NFR-6	**Scalability**	In addition, the sensor technology in smart bins can be updated for greater accuracy, ensuring both vertical and horizontal scalability, if the municipality wishes to increase the number of trash cans in any location.