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

Date	03 October 2022
Team ID	PNT2022TMID11760
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	Arduino Uno	It is a microcontroller board. It has 14 digital input/ output pins, 6 analogue inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller, simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.
FR-2	Ultrasonic Sensor	It sends out a high-frequency sound pulse and then times how long it takes for the echo of the sound to reflect back. The sensor has 2 openings on its front. One opening transmits ultrasonic waves, the other receives them . The ultrasonic sensor uses this information along with the time difference between sending and receiving the sound pulse to determine the distance to an object.
FR-3	Wi-Fi Module – ESP8266	The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.
FR-4	Jumper Wires	which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	A database will be maintained Containing the information about which dustbin to be placed in which area by their corresponding ids.
NFR-2	**Security**	There should be sufficient health and safety provisions for workers at all stages of waste handling.
NFR-3	**Reliability**	The way it can impact the city or even a country on a big scale is understandable, and hopefully in the future it is implemented.
NFR-4	**Performance**	The message has to be sent to server,about levels of garbage in a bin. Server matches ids with database of

		dustbins, and will find levels of dustbins located in different areas of city.
NFR-5	**Availability**	Provision of litter bins at public places shall be made and there will compulsory segregation at all the sources.
NFR-6	**Scalability**	By having a more convenient route garbage trucks spend less time on the road, therefore, congestion in smart cities can be decreased .By using IoT technology for remote diagnostics also means not having to send staff all the way to monitor assets.