**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 03 October 2022 |
| Team ID | PNT2022TMID24697 |
| Project Name | Project - Smart Waste Management System For Metropolitan Cities |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | Registration through Form  Registration through Gmail  Registration through LinkedIN |
| FR-2 | User Confirmation | Confirmation via Email  Confirmation via OTP |
| FR-3 | Node MCU | For alert messaging |
| FR-4 | Sensors | Inductive sensor, Moisture sensor , IR sensor ,ultrasonic sensor |
| FR-5 | Incinerator | To burn the unwanted wastes |
| FR-6 | LEDs | Red , yellow , green LEDs |

**Non-functional Requirements:**

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

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | A reduction in the number of waste collections needed by up to 80%, resulting in less manpower, emissions, fuel use and traffic congestion. A reduction in the number of waste bins needed. Analytics data to manage collection routes and the placement of bins more effectively. |
| NFR-2 | **Security** | The regular waste management system includes waste collection trucks and their drivers that follow a predefined route without examining the containers’ fullness level. This system can’t measure the fullness levels of containers, and as a result, half-full containers can be emptied, and in contrast, pre-filled ones need to wait until the next collection period comes. Moreover, since drivers collect empty bins, predefined collection routes of the system cause waste of time, an increase in fuel consumption, and excessive use of resources.  Another drawback is being unable to know when a fire or displacement occurs in the container. To enhance the current regular system into a better one, technological innovations and advancements are implemented into the waste collection process. Thus, we started to optimize waste management operations by using the technical opportunities called the smart waste management system |
| NFR-3 | **Reliability** | Smart waste management system is a much efficient way to manage waste. It makes the task easy for the trash collector by giving them the proper routes, filling patterns, reducing the operational cost, and fewer chances of being the waste or garbage filled for over a week or more. |
| NFR-4 | **Performance** | Smart waste management focuses on solving the previously mentioned solid waste management problems using sensors, intelligent monitoring systems, and mobile applications. The first smart waste management solution to make the waste collection process more efficient is sensors. |
| NFR-5 | **Availability** | Waste collection is an essential city service, yet existing waste management systems are resource-intensive, inefficient, and outdated. The Internet of Things (IoT) has the potential to greatly optimize collection services and reduce operational costs for cities. |
| NFR-6 | **Scalability** | The automated waste segregator is an efficient and economic waste collection system with a minimum amount of human intervention and also causes no hazard to human life. Employing a conveyor belt makes the system much more accurate, cost-effective, and also easier to put in and use at a domestic level. Segregating these wastes at a domestic level also will be timesaving. The proposed system meets the demand for constant checks on medical-waste content in the bins. It helps to dispose of the waste material before it overflows from the bins. This leads to a clean city for better living. |