Project Design Phase-II

Solution Requirements (Functional & Non-functional)

|  |  |
| --- | --- |
| Date | 26 October 2022 |
| Team ID | PNT2022TMID19657 |
| 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 | Detailed bin inventory | * The map shows all dumpsters and stands that are being monitored, and you can use Google Street View at any time to view them. * On the map, bins or stands appear as green, orange, or red circles. * The Dashboard displays information about each bin, including its capacity, trash kind, most recent measurement, GPS location, and pick-up schedule. |
| FR-2 | Real time bin monitoring | * Real-time information on the fill levels of bins monitored by smart sensors is shown on the dashboard. * The application also forecasts when the bin will fill up based on past data in addition to the percentage of fill level, which is one of the features that even the best waste management software lacks. * Sensors recognize picks as well; so you can check when the bin was last collected. * With real-time data and predictions, you can eliminate overflowing bins and stop collecting half-empty ones. |
| FR-3 | Expensive bins | * We assist you in locating bins that increase your collection costs. Each container is given a collection cost rating by the tool. * The tool takes into account the typical local depo-bin discharge distance. The tool determines the distance from depo-bin discharge and rates bins (1–10). |
| FR-4 | Adjust bin distribution | * Ensure the best possible bin distribution. * Determine whether a region has a dense or sparse bin distribution. |

|  |  |  |
| --- | --- | --- |
|  |  | * Ensure that every form of trash is present within a stand. * Based on historical data, change bin capacity or placement as necessary. |
| FR-5 | Eliminate inefficient picks | * Dispose of the accumulation of half-empty trash cans. * The sensors can detect picks. * We can demonstrate to you how full the bins you collect are using real-time data on fill-levels and pick recognition. |

# Non-functional Requirements:

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

|  |  |  |
| --- | --- | --- |
| **FR**  **No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | * The Internet of Things (IoT) gadget confirms usability as a unique and significant perspective to study user requirements, which can further enhance the design quality. * Analyzing how well people interact with a product can help designers better understand customers' prospective demands for waste management, behavior, and experience in the design process when user experience is at the center. |
| NFR-2 | **Security** | * Utilize recyclable bottles. * Utilize reusable shopping bags. Recycle and make smart purchases. * Steer clear of single-use food and beverage containers. |
| NFR-3 | **Reliability** | * Creating improved working conditions for waste collectors and drivers is another goal of smart waste management. * Waste collectors will use their time more effectively by attending to bins that need attention rather than driving the same collection routes and servicing empty bins. |
| NFR-4 | **Performance** | * The Smart Sensors measure the fill levels in bins (along with other data) numerous times every day using ultrasound technology. * The sensors transfer data to Sensoneo's Smart Trash Management Software System, a potent cloud-based platform, enabling data-driven everyday operations. This platform is also available as a waste management app. * As a result, customers receive data-driven decision-making services, and garbage collection routes, frequency, and truck loads are optimized, resulting in at least a 30% reduction in route length. |