**Project Design Phase-II**

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

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| Date | 16.05.23 |
| Team ID | NM2023TMID19394 |
| Project Name | Smartcity waste management systems with connected trashcans |

**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 | 1. Trash Can Monitoring | 1. Trash Can Monitoring:    * The system should include sensors installed in the trash cans to accurately measure and monitor the fill level of each bin.    * The sensors should provide real-time data on the fill level, allowing efficient waste collection planning. |
| FR-2 | 1. Connectivity and Communication: | * + The trash cans should be equipped with wireless or IoT connectivity to establish a seamless connection with the waste management system.   + The system should ensure reliable and secure communication between the trash cans and the central waste management system. |
| FR-3 | 1. Centralized Management System: | * + The waste management system should have a centralized management platform or dashboard that displays real-time data from all connected trash cans.   + The platform should provide an intuitive user interface for monitoring and managing the trash cans efficiently. |
| FR-4 | 1. Fill Level Thresholds and Alerts:    * . | 1. Fill Level Thresholds and Alerts:    * The system should allow operators to set fill level thresholds for each trash can, indicating when it is time for collection.    * When a trash can reaches the predefined threshold, the system should generate automated alerts or notifications to the waste management team. |
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**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** | Simple Interface: The interface of these systems is designed to be simple and easy to use.  Automatic Notifications: The system can automatically notify waste management companies when a trash can is full or needs to be emptied.  Efficient Data Analytics: Smart city waste management systems use data analytics to track waste generation patterns and predict future waste generation trends  Customizable Settings: Users can customize the settings of the system to meet their specific needs.   1. Real-time Feedback: Smart city waste management systems provide real-time feedback to users, allowing them to monitor the status of their waste disposal in real-time. This helps users to better manage their waste disposal and to reduce their environmental impact. |
| NFR-2 | **Security** | Smart city waste management systems with connected trash cans can be made secure by implementing appropriate security measures and following best practices for IoT security. By doing so, these systems can provide effective waste management while maintaining the privacy and security of user data. |
| NFR-3 | **Reliability** | Smart city waste management systems with connected trash cans can be made reliable by using high-quality components, implementing redundancy, performing regular maintenance, real-time monitoring, and battery backup. By doing so, these systems can provide reliable waste management solutions for cities. |
| NFR-4 | **Performance** | Smart city waste management systems with connected trash cans can be made reliable by using high-quality components, implementing redundancy, performing regular maintenance, real-time monitoring, and battery backup. By doing so, these systems can provide reliable waste management solutions for cities. |
| NFR-5 | **Availability** | Smart city waste management systems with connected trash cans can be optimized for availability by implementing redundancy, using cloud-based storage, performing regular maintenance, having a disaster recovery plan in place, and real-time monitoring. By doing so, these systems can provide reliable and always-available waste management solutions for cities. |
| NFR-6 | **Scalability** | Smart city waste management systems with connected trash cans can be optimized for scalability by using a modular design, cloud-based infrastructure, distributed architecture, open standards, and future-proofing. By doing so, these systems can provide scalable waste management solutions for cities, enabling them to handle increasing amounts of waste as they grow and expand. |