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

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Team ID	NM2023TMID17565
Project Name	Project - Intelligent Garbage Classification Using Deep Learning

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Input data acquisition	The system should be able to receive input data in the form of images or sensor data representing garbage items. It should support various input sources such as cameras, sensors, or file uploads
FR-2	Pre processing	The system should pre process the input data to prepare it for the deep learning model. This may involve resizing images, normalizing pixel values, and applying other transformations to ensure consistent and standardized input
FR-3	Model training and prediction	The system should train a deep learning model on a labeled dataset of garbage images or sensor data to learn patterns and features for classification. It should then be able to predict the waste type or category based on new input data.
FR-4	Classification accuracy	The system should have a high level of accuracy in classifying different types of waste. It should be able to handle a wide range of waste materials, including but not limited to plastic, glass, paper, metal, and organic waste.
FR-5	Real-time processing	The system should be capable of processing input data and providing classification results in real-time or near real-time to ensure efficient garbage sorting.

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system should have a user-friendly interface that is intuitive and easy to use. It should require minimal training or technical expertise for users to interact with the system effectively. Clear and informative visualizations of classification results can enhance usability.
NFR-2	**Security**	The system should ensure the security and privacy of the data it processes. It should implement

		measures to protect sensitive information, prevent unauthorized access, and comply with relevant data protection regulations.
NFR-3	**Reliability**	The system should be reliable, with high availability and minimal downtime. It should have built-in mechanisms for fault tolerance, error recovery, and system monitoring to detect and address any issues promptly.
NFR-4	**Performance**	The system should be able to process and classify garbage items within an acceptable timeframe, ensuring real-time or near real-time results. It should have low latency and high throughput to handle a large volume of input data. The system should be designed to handle increasing data volumes and user loads. It should be able to scale horizontally or vertically to accommodate growing demands without compromising performance or accuracy.
NFR-5	**Availability**	The system should be designed with redundancy and fault tolerance mechanisms to minimize downtime and ensure uninterrupted operation. This can include deploying the system across multiple servers or using load balancing techniques to distribute the workload.
NFR-6	**Scalability**	The system should be designed to handle increasing data volumes and user loads. It should be able to scale horizontally or vertically to accommodate growing demands without compromising performance or accuracy.