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

Date	06 May 2023
Team ID	NM2023TMID01304
Project Name	Project – Garbage classification

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Garbage Identification	Object Recognition: The system should be able to recognize different types of objects commonly found in garbage, such as plastic bottles, paper, glass, metal cans, etc. Feature Extraction: The solution should extract relevant features from garbage items, such as color, texture, shape, size, and material composition, to aid in their classification.
FR-2	Image recognition	Image Preprocessing: The system should preprocess input images to enhance their quality, normalize lighting conditions, and remove noise or artifacts that could affect the accuracy of recognition algorithms. Feature Extraction: The solution should extract meaningful features from input images, such as edges, textures, colors, or local descriptors, to represent and characterize the objects or patterns within the images.
FR-3	Real time processing	Low Latency: The system should have minimal processing latency, ensuring that the classification or analysis of data is performed quickly and in near real-time. High Throughput: The solution should be capable of handling a large volume of incoming data or requests within a short time frame, without sacrificing the processing speed

FR-4	User interface	Intuitive Design: The user interface should be designed in a way that is intuitive and easy to understand, minimizing the learning curve for users. Responsive and Adaptive: The interface should be responsive and adapt to different screen sizes and resolutions, allowing users to access and interact with the system across various devices such as desktops, laptops, tablets, and smartphones.
FR-5	Multiple input methods	Image Upload: The system should allow users to upload images from their devices or capture images using their device's camera, providing a straightforward and intuitive way to input visual data. Text Input: The solution should support text input methods, allowing users to manually enter descriptions, keywords, or other textual information related to the garbage items for classification.
FR-6	Data base management	Data Storage: The solution should provide a robust and scalable database to store and manage data related to garbage items, including their classification, properties, and any additional relevant information. Data Modeling: The database should employ appropriate data modeling techniques, such as entity-relationship modeling, to represent the relationships and structure of the data in a logical and efficient manner.

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 be user-friendly, with an intuitive interface that allows users to easily interact with it. It should provide clear instructions and feedback to guide users through the garbage classification process.
NFR-2	**Security**	The garbage classification system should prioritize the security of user data and prevent unauthorized access or tampering. It should employ appropriate encryption methods to protect sensitive information and implement access controls to ensure data confidentiality.

NFR-3	**Reliability**	The system should consistently and accurately classify garbage items, minimizing errors and false classifications. It should have built-in error handling mechanisms to recover from failures and ensure continuous operation.
NFR-4	**Performance**	The system should be able to process and classify garbage quickly and accurately. It should have minimal response times to handle high volumes of garbage and ensure efficient resource utilization.
NFR-5	**Maintainability**	The system should be easy to maintain and update, with modular and well-documented code. It should have clear separation of concerns, allowing for efficient bug fixes, feature enhancements, and system upgrades without disrupting the overall functionality
NFR-6	**Scalability**	the system should be designed to handle increasing volumes of garbage items and accommodate a growing number of users. It should be scalable to support future expansion and be able to maintain performance levels even with a larger user base.