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

Date	21 June 2025
Team ID	LTVIP2025TMID32454
Project Name	Clean Tech:Transforming Waste Management with Transfer learning
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	Image Capture & Input	Image acquisition from conveyor belts, smart bins, factory disposal zones
FR-2	Preprocessing Pipeline	Image resizing, normalization, noise removal, and data augmentation
FR-3	Model Training & Classification	Fine-tune pre-trained models (e.g., ResNet, MobileNet); classify images into waste categories
FR-4	Real-time Waste Categorization	Classify waste as recyclable, organic, hazardous, or general
FR-5	Integration with Sorting/City/Fabrication Systems	Send signals to sorters, dashboard updates, or generate alerts for wrong waste types
FR-6	Dashboard & Monitoring	Display classification logs, camera status, processing stats

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Easy-to-use interface for admins to monitor the classification and system status
NFR-2	Security	Secure access for image upload, model endpoints, and control interfaces
NFR-3	Reliability	High-accuracy classification with minimal false positives/negatives
NFR-4	Performance	Real-time inference capability under low latency (≤ 1s per classification)
NFR-5	Availability	System should maintain 99.5% uptime for continuous operations
NFR-6	Scalability	Able to scale across multiple bins, factories, or centers without degradation in performance