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

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| Date | 3 June 2025 |
| Team ID | LTVIP2025TMID38840 |
| Project Name | Cleantech: 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 Input Interface | Allow users to upload an image of a waste item (e.g., JPG, PNG). Provide form validation and clear visual feedback for the upload process. |
| FR-2 | Model Prediction | Use the trained **DL model** to process the image and predict the waste category. Return prediction output as "Recyclable," "Biodegradable," or "Trash." |
| FR-3 | Result Page Generation | Display the prediction result on a clear, dedicated page. Show the user's uploaded image alongside the predicted category. |
| FR-4 | Prediction Output | Display the final predicted waste category in a prominent format. Optionally, include a confidence score or a brief description of the category. |
| FR-5 | User History Dashboard | Registered users can view a log of their past submissions. The dashboard should show the image, the date of upload, and the prediction result for each entry. |
| FR-6 | Model Information | Provide a page describing the model architecture (e.g., VGG16), the dataset used for training, and its accuracy for transparency. |

**Non-functional Requirements:**

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

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | The interface should be simple and intuitive, allowing a non-technical user to easily upload an image and understand the result. |
| NFR-2 | **Security** | All user credentials and personal data (if a user system is implemented) must be securely processed and stored. Uploaded images should be handled privately. |
| NFR-3 | **Reliability** | The model should consistently deliver correct classifications for waste types it was trained on, with no unexpected failures. |

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| NFR-4 | **Performance** | The prediction must be generated and displayed to the user within 2–3 seconds of submitting the image. |
| NFR-5 | **Availability** | The system should be accessible 24/7 with minimal downtime, allowing users to classify waste whenever needed. |
| NFR-6 | **Scalability** | Should support a growing number of users and concurrent classification requests without a significant drop in performance. |