**Project Design Phase-II**

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

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| Date | 24 June 2025 |
| Team ID | LTVIP2025TMID35341 |
| Project Name | Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables |
| Maximum Marks | 4 Marks |

**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 | User Registration | - Registration through Form  - Registration through Gmail  - Registration through LinkedIn |
| FR-2 | User Confirmation | - Confirmation via Email  - Confirmation via OTP |
| FR-3 | Image Upload | - Upload fruit/vegetable image from local system - Support for multiple image formats (JPG, PNG, etc.) |
| FR-4 | Image Preprocessing | - Normalize image size  - Apply filters for clarity  - Augmentation images(for training phase) |
| FR-5 | Fruit/Vegetable Classification | - Use trained DL model to detect and classify as Fresh or Rotten - Handle 28 categories of fruits/vegetables |
| FR-6 | Result Display | - Show Prediction label (Fresh/Rotten) - Display confidence score |
| FR-7 | Model Training | - Train model using labeled datasets  - Implement transfer learning with VGG16/MobileNetV2 |
| FR-8 | Report Generation | - Generate downloadable diagnostic report in PDF  - Include summary of detected cells and possible conditions |

**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** | UI should be simple, responsive, and usable by farmers, sellers, and consumers with minimal training. |
| NFR-2 | **Security** | Use encrypted storage and HTTPS. Implement authentication and authorization for access control. |
| NFR-3 | **Reliability** | Ensure model and services work consistently under varied input loads and conditions. |
| NFR-4 | **Performance** | Classification results should be returned in under 3 seconds per image. Model inference should be optimized. |
| NFR-5 | **Availability** | The application should be available 24/7 with minimal downtime (99.5% uptime target). |
| NFR-6 | **Scalability** | System should handle increasing users and image uploads without degradation in performance. |