**Project Design Phase**

**Proposed Solution Template**

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| Date | 16 June 2025 |
| Team ID | LTVIP2025TMID41917 |
| Project Name | Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

Project team shall fill the following information in the proposed solution template.

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| **S.No.** | **Parameter** | **Description** |
|  | Problem Statement (Problem to be solved) | Food wastage due to spoilage and manual inefficiencies in identifying rotten fruits and vegetables in supply chains, retail, and markets. Traditional methods are slow, inconsistent, and labor - intensive. |
|  | Idea / Solution description | The proposed solution uses transfer learning with deep learning models (e.g., pre-trained CNNs) to automatically detect and sort rotten produce. This smart system can be integrated into sorting lines using cameras and real-time detection algorithms to flag or remove spoiled items instantly. |
|  | Novelty / Uniqueness | Unlike traditional systems that require expensive infrastructure or manual inspection, this solution leverages pre-trained models with minimal data and cost, making it easy to deploy in both high- and low-resource settings. The adaptability to different produce types adds to its uniqueness. |
|  | Social Impact / Customer Satisfaction | Reduces food waste, ensures safer and fresher food for consumers, and helps farmers and retailers protect reputation and revenue. It supports sustainable agriculture and reduces the risk of selling spoiled food, improving customer trust. |
|  | Business Model (Revenue Model) | The system can be offered as a subscription-based SaaS model for supermarkets, warehouses, and farms. Additional revenue can be generated through hardware integration packages, maintenance contracts, and customization services. |
|  | Scalability of the Solution | The model can be scaled across different fruits and vegetables, geographies, and languages. The lightweight AI setup can be deployed on edge devices, cloud platforms, or mobile apps, making it suitable for large-scale commercial and smallholder farm use alike. |