**Project Design Phase**

**Proposed Solution Template**

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| Date | 25 June 2025 |
| Team ID | LTVIP2025TMID35341 |
| 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) | Manual sorting of rotten fruits and vegetables is slow, error-prone, and labor-intensive. It leads to inefficient quality control, increased food wastage, and poor customer satisfaction, especially in large-scale food processing or retail environments. |
|  | Idea / Solution description | Smart Sorting applies transfer learning using pre-trained deep learning models (e.g., VGG16) to classify fruits and vegetables as fresh or rotten. The model is integrated with a Flask-based web interface for real-time predictions and user interaction.. |
|  | Novelty / Uniqueness | The solution uses transfer learning to achieve high accuracy with limited training data. Its lightweight, modular architecture allows seamless deployment in food industries, supermarkets, and even smart kitchens. The model is also extensible to new classes. |
|  | Social Impact / Customer Satisfaction | The system ensures better food quality, reduces food waste, and minimizes human effort. It improves customer satisfaction in retail and enhances operational efficiency in agriculture and supply chains by offering fast and consistent quality checks. |
|  | Business Model (Revenue Model) | The solution can be offered as a B2B product to food processing units, farms, and retail chains. Revenue can be generated through licensing, a subscription-based SaaS model, or integration with smart devices and logistics platforms as a value-added service. |
|  | Scalability of the Solution | The architecture supports scalability for new fruit/vegetable classes and regions. It can be deployed on local servers or the cloud, integrated with conveyor-based cameras, and adapted for mobile or smart fridge systems with minimal changes. |