

Project Design Phase
Proposed Solution Template

Date	24 th June 2025
Team ID	LTVIP2025TMID34982
Project Name	Smart Sorting using Transfer learning
Maximum Marks	2 Marks

Proposed Solution Template:

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

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	A large percentage of fruits and vegetables are wasted due to poor sorting and delayed detection of spoilage. Manual inspection is time-consuming, inconsistent, and not scalable for farmers, vendors, or warehouses. There is a need for a fast, automated, and accurate solution to classify produce as healthy or rotten using technology.
2.	Idea / Solution description	SmartSorting is an AI-powered image classification system that uses a deep learning model (VGG16) to detect and classify fruits and vegetables as healthy or rotten . Users can upload images through a web interface, and the system instantly provides a prediction. It is trained on 29 classes using a dataset of 29,000+ images and can be deployed via a lightweight Flask application.
3.	Novelty / Uniqueness	Unlike traditional sorting mechanisms, SmartSorting is low-cost, uses pre-trained transfer learning (VGG16) , and can be operated through a simple web browser. It can handle multiple fruit and vegetable types, making it flexible and suitable for various environments (farms, markets, warehouses). The solution also supports real-time predictions and can be adapted to mobile or IoT devices.
4.	Social Impact / Customer Satisfaction	The system reduces food waste, increases supply chain efficiency, and ensures better quality control. Farmers, small vendors, and cold storage units can benefit without needing expensive hardware. The simplicity and accuracy of the tool ensure ease of use and confidence in quality assurance.
5.	Business Model (Revenue Model)	The solution can be monetized as a subscription-based SaaS platform for agricultural companies, marketplaces, and warehouse chains. A freemium model can also be offered for small vendors. Additional services like bulk analysis, mobile integration,

		and predictive analytics can be add-ons for revenue.
6.	Scalability of the Solution	The model is scalable both technically and commercially. The backend can be hosted on the cloud and integrated with mobile apps or IoT cameras. The dataset can be expanded, and the model can be retrained to include more food items. SmartSorting can be deployed at farmer cooperatives, logistics hubs, and e-commerce quality check points.