

Proposed Solution Template

Brainstorm & Idea Prioritization Template

Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables

Team ID : LTVIP2026TMIDS34961

Proposed Solution Template:

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

S.No.	Parameter	Description
	Problem Statement (Problem to be solved)	<ul style="list-style-type: none">• In food supply chains, especially in supermarkets, food processing units, and storage facilities, the timely identification of rotten fruits and vegetables is crucial to prevent health hazards, reduce waste, and maintain product quality. Manual inspection is time-consuming, inconsistent, and prone to human error.• This project aims to automate the classification of fresh and rotten fruits using deep learning and transfer learning techniques. The solution must accurately distinguish between fresh and rotten produce based on image inputs, thereby enabling real-time quality monitoring.
	Idea / Solution description	<ul style="list-style-type: none">• Smart Sorting is an AI-based system that leverages transfer learning to automatically detect rotten fruits and vegetables from fresh ones using image classification.• By utilizing pre-trained deep learning models such as ResNet, VGG, or MobileNet, and fine-tuning them on a custom dataset of fruit and vegetable images, the system offers high accuracy with minimal training time.
	Novelty / Uniqueness	<ul style="list-style-type: none">• By leveraging pre-trained CNN models and fine-tuning them on a curated dataset of fruits and vegetables• the system achieves high accuracy with minimal data and training time — a

		major breakthrough for practical implementation in resource-constrained settings.
	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> • Reduction in Food Waste: By detecting rotten fruits and vegetables early, Smart Sorting helps prevent the unnecessary disposal of good produce and minimizes post-harvest losses. • Improved Public Health: Removing spoiled items before they reach consumers helps reduce the risk of foodborne illnesses, especially important in large-scale food distribution and retail. • Environmental Benefits: Less food waste means less organic matter in landfills, contributing to a reduction in greenhouse gas emissions (e.g., methane), aligning with climate action goals.
	Business Model (Revenue Model)	The Smart Sorting system operates on a B2B (Business-to-Business) and B2C (Business-to-Consumer) hybrid model, targeting food industry players and tech-savvy consumers through flexible monetization strategies.
	Scalability of the Solution	The Smart Sorting system is designed with a highly scalable architecture that can adapt to various environments — from large industrial plants to compact smart home setups — with minimal modifications. Its scalability spans technical, market, and geographic dimensions