Project Design Phase Problem-Solution Fit

Date	31 January 2025
Team ID	LTVIP2026TMIDS74869
Project Name	Transfer Learning for Identifying Rotten Fruits and Vegetables
Maximum Marks	2 Marks

Problem – Solution Fit Overview

The Problem–Solution Fit validates that a real customer problem exists and that the proposed solution effectively addresses it. For this project, the fit is evaluated across supermarket owners, agricultural suppliers, and customers who face challenges in identifying fresh and rotten fruits and vegetables accurately. Manual inspection methods are inefficient, inconsistent, and lead to food wastage and financial losses.

Target Customers

- **Supermarket and grocery store owners**
- **Agricultural suppliers and farmers**
- **Fruit and vegetable wholesalers**
- **Regular consumers purchasing fresh produce**

Customer Problems (Key Pains)

- **Difficulty in accurately identifying fresh vs rotten produce**
- **Time-consuming manual inspection process**
- **Increased food wastage due to improper sorting**
- **Financial losses from selling spoiled products**
- **Lack of automated and intelligent freshness detection system**

Proposed Solution

An AI-Based Fruit & Vegetable Freshness Detection System that provides:

- **Image-based classification using Machine Learning**
- **Real-time prediction of Healthy or Rotten produce**
- **Confidence score display for decision support**
- **Web-based user interface for easy access**
- **Scalable deployment for retail and agricultural use**

Problem–Solution Fit Mapping

Customer Problem	Solution Feature	Expected Impact
Inaccurate manual inspection	AI-based image classification model	Improved accuracy in freshness detection
Time-consuming sorting process	Real-time automated prediction	Faster decision-making
Food wastage	Early detection of rotten items	Reduced waste and losses
Customer dissatisfaction	Reliable freshness validation	Increased customer trust
Lack of automation	Web-based intelligent system	Improved operational efficiency

Channels & Adoption

- **Integration with supermarket inventory systems**
- **Web-based application for retail stores**
- **API-based integration for agricultural platforms**
- **Pilot deployment in local grocery stores**

Success Metrics

- **Model Accuracy, Precision, Recall, F1-score**
- **Reduction in food wastage percentage**
- **Prediction response time (<1 second)**
- **Increased customer satisfaction**
- **Improved business efficiency**

Future Improvements

- **Multi-class classification for different fruit types**
- **Mobile application integration**
- **Real-time camera-based detection system**
- **Cloud deployment for large-scale usage**
- **Integration with IoT-based smart sorting systems**