Project Design Phase
Problem – Solution Fit Template

Date	5 February 2026
Team ID	LTVIP2026TMIDS75799
Project Name	Smart Sorting: Transfer Learning for Identifying Rotten Fruits and Vegetables
Maximum Marks	2 Marks

Problem–Solution Fit Template

The Problem–Solution Fit

We identified a major challenge experienced by growers, wholesalers, and logistics teams: the inability to consistently and rapidly screen fruits and vegetables for spoilage.

Current manual inspection methods are inefficient, subjective, and often too slow to keep up with the demands of modern distribution.

Our project offers a deep learning-powered visual inspection system that leverages transfer learning with ResNet to automate defect detection, minimize human error, and improve overall product quality and profitability.

Purpose

☑ Enable producers and supply chain operators to detect and separate defective produce with speed and confidence using an intuitive AI solution integrated into their regular workflows.

☑ Promote widespread use by ensuring the system works on low-cost devices like standard Android smartphones and does not require constant internet access, making it practical for both urban and rural environments.

☑ Enhance engagement and trust by crafting clear, relatable messaging around reducing waste, protecting revenue, and assuring freshness, connecting with users' priorities and concerns.

☑ Deepen loyalty and adoption by directly addressing common issues such as unreliable visual checks, labor-intensive sorting processes, and avoidable spoilage losses, while delivering a simple and effective alternative.

Template:

1. CUSTOMER SEGMENT(S):

- Mid-sized commercial growers
- Fresh produce distributors and packhouses

6. CUSTOMER CONSTRAINTS

- Limited access to high-quality imaging equipment
- Seasonal income fluctuations affecting purchasing decisions
- Resistance to adopting unfamiliar technology

5. AVAILABLE SOLUTIONS

- Visual checks performed by supervisors or quality controllers
- Mechanical graders that separate produce by size or shape
- Handheld devices for

.4. JOBS-TO-BE-DONE / PROBLEMS:

- Minimize the time and effort required for quality inspection of produce
- Lower overall labor expenses associated with manual sorting

9. PROBLEM ROOT CAUSE:

- Limited availability of cost-effective and easy-to-use quality inspection technologies
- Overreliance on manual labor, often lacking specialized training or expertise

7. BEHAVIOUR

- Conduct visual inspection and manual sorting of each fruit or vegetable
- Hire temporary workers during peak harvest periods to manage increased workload

3. TRIGGERS

High product returns due to poor quality
Customer complaints or health concerns

4.EMOTIONS:BEFORE/AFTER:

Stage	Emotion
Before	**Anxious, fatigued, frustrated, uncertain, fearful of losses**
After	**Empowered, calm, assured, satisfied, confident in technology**

10. YOUR SOLUTION

Smart Sorting: AI-Powered Freshness Detection for Fruits & Vegetables

- Leverage transfer learning with MobileNetV2 to accurately identify early signs of spoilage
- Integrate with mobile and web applications for real-time camera-based scanning

8.CHANNELS OF BEHAVIOUR

8.1 ONLINE

8.2 Explore agricultural tips and tutorials on platforms like YouTube

8.3 8.2 OFFLINE

8.4 Join local farmer gatherings, agricultural fairs (Krishi melas), and workshops

8.5 Connect with cooperative societies and agricultural input suppliers