Ideation Phase

Brainstorm & Idea Prioritization Template

Date	31 January 2025
Team ID	LTVIP2025TMID35093
Project Name	Smart Sorting & Transfer Learning for Identifying Rotten Fruits and Vegetables
Maximum Marks	4 Marks

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Problem Statement Selected:
"Develop a smart system using computer vision and transfer learning to automatically detect and sort rotten fruits and vegetables from fresh ones in real-time."

Team Activities:

- Formed a multidisciplinary team (AI/ML, hardware, domain expert in agriculture).
- Held an initial Zoom meeting to discuss problem statement.
- Identified the goal: reduce food waste and automate quality control in supply chains using AI.
- Tools used for collaboration: Google Meet, Miro Board, WhatsApp Group for coordination.

Step-2: Brainstorm, Idea Listing and Grouping

Raw Idea List:

1. Use pre-trained CNN models (like MobileNetV2 or ResNet50) with transfer learning.
2. Implement real-time image classification using a Raspberry Pi and camera module.
3. Include moisture or odor sensors to support image-based classification.
4. Design a conveyor belt prototype for physical sorting.
5. Create a mobile app interface for monitoring the sorting status.
6. Build a cloud-based dashboard with analytics on rotten/fresh ratio.

7. Use edge computing to make the system portable.
8. Apply data augmentation techniques to improve training with fewer samples.
9. Use YOLOv8 for object detection to locate multiple fruits in one frame.
10. Introduce smart bins with automatic separation.
11. Partner with local fruit vendors for real dataset collection.
12. Design for scalability to industrial use-cases.
13. Integrate solar power for energy efficiency in rural areas.

Grouping of Ideas into Categories:

Category	Ideas
AI/ML	1, 8, 9
Hardware	2, 4, 10, 13
UX/UI	5, 6
System Design	3, 7, 11, 12

Step-3: Idea Prioritization

Prioritization Matrix (Effort vs. Impact):

Idea	Effort (Low/Med/High)	Impact (Low/Med/High)	Priority
Transfer learning with CNNs (MobileNet/ResNet)	Med	High	High
Real-time classification with Raspberry Pi	High	High	High
Conveyor belt prototype	High	Med	Medium
Data Augmentation	Low	High	High
Smart bins	High	Low	Low
Cloud dashboard	Med	Med	Medium
YOLOv8 for detection	Med	High	High
Moisture/Odor sensors	Med	Medium	Medium
Solar-powered system	High	Medium	Low

Mobile app interface	Low	Medium	Medium

Top 3 Prioritized Ideas for MVP:

1. Use of transfer learning (MobileNetV2 or ResNet50)
2. Real-time classification using Raspberry Pi
3. YOLOv8-based object detection for multi-fruit analysis