Ideation Phase
Brainstorm & Idea Prioritization Template

Date	27 June 2025
Team ID	LTVIP2025TMID41476
Project Name	Smart Sorting:Transfer Learning for Identifying rotten fruits and vegetables
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming helps us generate innovative solutions by combining agricultural, retail, and household needs with AI-based technological possibilities. In this project, our goal is to **automate the detection and sorting of rotten fruits and vegetables using transfer learning**, enhancing quality control across industries.

This template enables our team to collaborate creatively—whether in person or remotely—to explore a wide range of ideas across **dataset curation, model selection, real-time deployment, waste reduction**, and **user experience**.

By encouraging open discussion, we can prioritize impactful ideas such as:

- Real-time detection using VGG16 and pre-trained models
- Deployable architecture across industries, retail outlets, and smart homes
- Alert systems via mobile apps for households
- Camera-based image capture and auto-sorting in factories
- Modular dataset expansion (support for various fruits and vegetables)
- Privacy in home monitoring systems

Using this structure, we ensure that our most valuable and feasible ideas are recognized, refined, and implemented—ultimately leading to a **scalable, accurate, and impactful smart sorting solution**.

This brainstorming session is focused on identifying ways to improve quality control, reduce food waste, and enhance user convenience across different environments. By encouraging all voices—technical, industrial, retail, and end-user—we can generate a wide variety of ideas, from smart kitchen integration to advanced model retraining. Using this template, we'll prioritize those ideas that not only improve performance and usability, but also increase adoption and trust in the system.

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

Template

Brainstorm & idea prioritization

Use this template to brainstorm innovative ways to improve and expand the Smart Sorting system. Our goal is to enhance the efficiency, accuracy, and scalability of the AI model that identifies rotten fruits and vegetables using transfer learning

- **10 minutes** to prepare
- **1 hour** to collaborate
- **2-5 people** recommended

Before you collaborate

Taking a few minutes to prepare will help your Smart Sorting session run smoothly and generate better results. Here's what you should do before diving in.

⏱ 10 minutes

A Team gathering
Gather a well-rounded team that includes ML engineers, data handlers, agricultural specialists, and deployment developers. Assign clear roles and responsibilities. Share any pre-work such as current datasets, sample outputs, and insights from previous models to ensure everyone is informed and ready to contribute meaningfully.

B Set the goal
Clearly define what your team is aiming to solve. A sample focus could be: "How can we improve the classification of fresh vs. rotten fruits using transfer learning in a resource-efficient way?" Make sure everyone understands the scope—whether it's improving model performance, enhancing dataset variety, or preparing the model for real-world testing.

C Learn how to use the facilitation tools
Review the tools you'll be using during the session. Platforms like Google Colab, Miro, GitHub, or Jamboard help structure collaboration. Ensure everyone has access and basic familiarity with these tools to minimize delays and support an engaging, efficient brainstorming process.

1 Define your problem statement

How might we use transfer learning to automate the detection and classification of rotten fruits and vegetables to improve food quality and reduce waste?

⏱ 5 minutes

> **PROBLEM**
> Identifying and sorting rotten fruits and vegetables is time-consuming, labor-intensive, and error-prone. Our aim is to develop a smart system using transfer learning that can automatically detect and classify rotten produce to ensure food quality and reduce waste in supply chains.

Key rules of brainstorming
To run an smooth and productive session

- Stay in topic.
- Defer judgment.
- Go for volume.
- Encourage wild ideas.
- Listen to others.
- If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2 Brainstorm

How might we use transfer learning to accurately detect and classify rotten fruits and vegetables?

⏱ 10 minutes

TIP
You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

Person 1
- Use Pre-trained CNN models like VGG16 or ResNet.
- Classify fruits/ vegetables as fresh or rotten.
- Collect real-time images from markets or kaggle dataset.

Person 2
- Use flask for a web-based demo.
- Improve accuracy with data augmentation.
- Test on multiple fruit/ vegetable types.

Person 3
- Add voice assistant for accessibility.
- Targeted Fine-Tuning.
- Lightweight model optimization.

Person 4
- Real-time performance dashboard.
- Add mobile camera integration.
- Use Grad-CAM for model explainability.

3 Group ideas

Discuss and cluster related ideas into groups like Data, Model, or Deployment. Give each group a clear label. If a group gets too large, break it into smaller, focused sub-groups.

⏱ 20 minutes

TIP
You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

- 1.Data and Preparation Dataset from Kaggle
- 2.Model and Technology Use VGG16(transfer learning) Data augmentation(improve accuracy)
- 3.Deployment Flask app Web integration
- 4.User Experience easy-to-use-interface
- 5.Impact and Sustainability
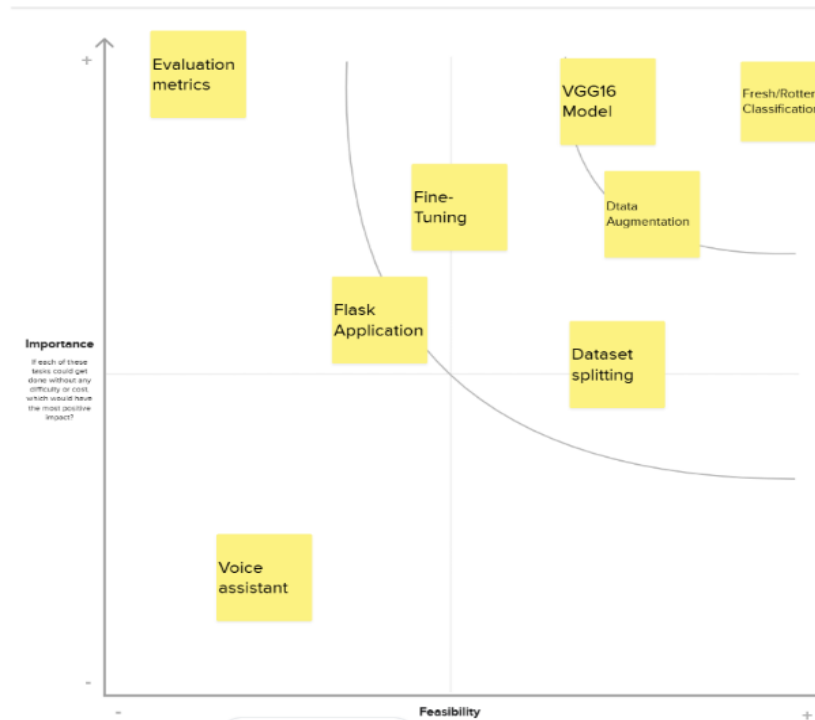
Step-3: Idea Prioritization

Prioritize

Work with your team to decide which ideas matter most and are realistic to build. Use the grid to place each idea based on importance and feasibility. Focus on ideas that best solve the problem of sorting rotten fruits and vegetables. Pick the top ones to take forward in your project.

⏱ 20 minutes

TIP

Participants can use their cursors to point at where sticky notes should go on the grid. The facilitator can confirm the spot by using the laser pointer holding the **H key** on the keyboard.

Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

- Evaluation metrics
- VGG16 Model
- Fresh/Rotten Classification
- Fine-Tuning
- Dtata Augmentation
- Flask Application
- Dataset splitting
- Voice assistant

Feasibility

After you collaborate

Work with your team to decide which ideas matter most and are realistic to build. Use the grid to place each idea based on importance and feasibility. Focus on ideas that best solve the problem of sorting rotten fruits and vegetables. Pick the top ones to take forward in your project.

Quick add-ons

Share the mural
Share your Smart Sorting board with stakeholders, export it as a PDF/image, and use it to align your team on priorities and next steps.

Export the mural
Use the mural to brainstorm ideas, map out model features, prioritize tasks, and track feedback. It helps your team stay organized and aligned throughout development.

Keep moving forward

ML Model Planning Blueprint:
Define key model components like dataset type, preprocessing, and evaluation metrics.

Integration Map:
how how the model fits into real sorting workflows (e.g., farms or markets).

Strengths, weaknesses, opportunities & threats
Strength: Utilizes transfer learning for accurate and efficient rotten fruit/vegetable detection.
Weakness: Depends heavily on quality image data and controlled conditions.
Opportunity: Can be applied in agriculture, retail, and automated sorting systems.
Threat: Faces competition from existing advanced commercial solutions.