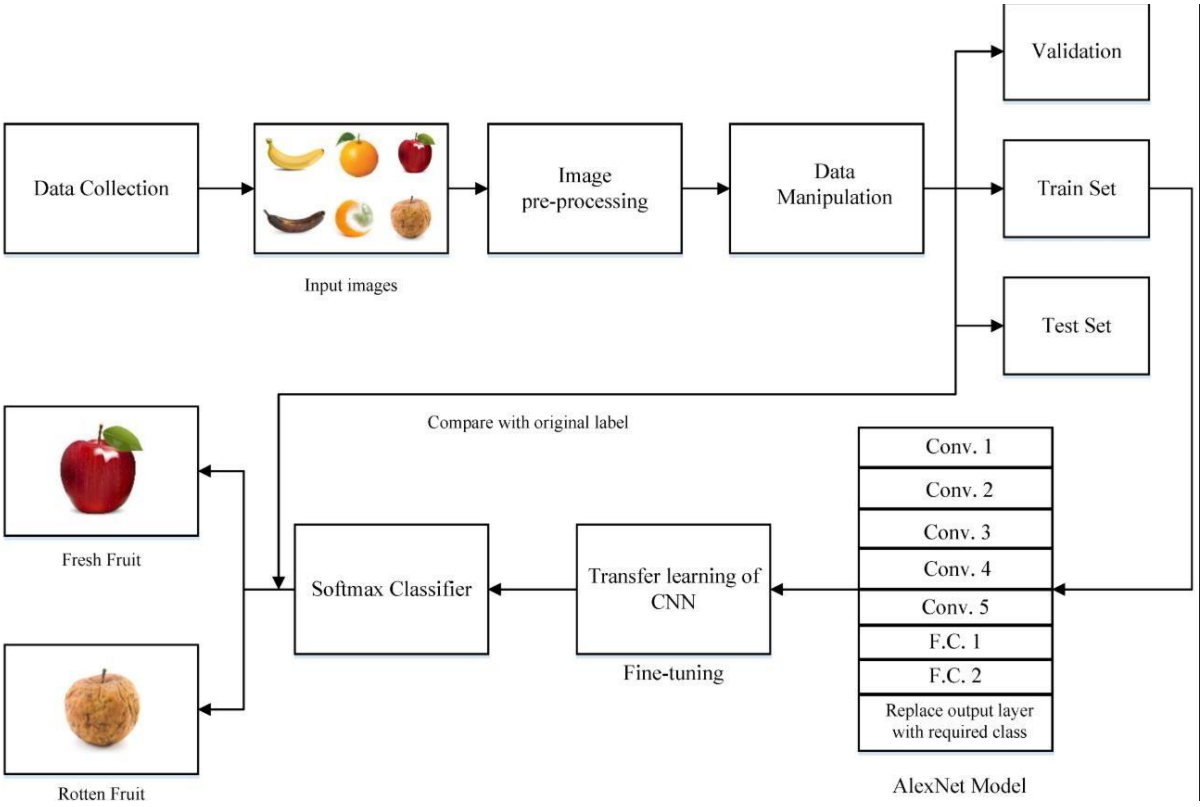
Project Design Phase
Solution Architecture

Date	27 June 2025
Team ID	LTVIP2025TMID41045
Project Name	Smart Sorting:Transfer Learning for Identifying rotten fruits and vegetables
Maximum Marks	4 Marks

Solution Architecture:

- The **business problem** is the manual, time-consuming, and error-prone process of identifying and sorting rotten fruits and vegetables in agricultural, retail, and domestic environments.
- The **project uses computer vision** powered by **transfer learning with the VGG16 deep learning model**, trained on datasets of fresh and rotten fruits/vegetables to automate this identification process.
- The **system captures real-time images** of produce using camera devices installed in conveyor systems, supermarket docks, or refrigerators.
- These images are **preprocessed** and passed through a **fine-tuned VGG16 model**, which performs binary classification (Fresh vs Rotten).
- The architecture includes **data acquisition (image capture), preprocessing (resizing, normalization), model inference (VGG16), and user interaction** (through dashboard or mobile app alerts).
- Deployment is supported via **Raspberry Pi for edge devices**, **Flask for interface**, and **cloud or local deployment** depending on use-case (industrial, retail, or smart home).

.**Example - Solution Architecture Diagram and flow diagram**


Data Collection
Input images
Image pre-processing
Data Manipulation
Validation
Train Set
Test Set
Compare with original label
Fresh Fruit
Rotten Fruit
Softmax Classifier
Transfer learning of CNN
Fine-tuning
Conv. 1
Conv. 2
Conv. 3
Conv. 4
Conv. 5
F.C. 1
F.C. 2
Replace output layer with required class
AlexNet Model