Project Design Phase
Solution Architecture

Date	27 June 2025
Team ID	LTVIP2025TMID41438
Project Name	GrainPalette - A Deep Learning Odyssey In Rice Type Classification Through Transfer Learning
Maximum Marks	4 Marks

Solution Architecture:

- The business problem addressed is the rapid and accurate identification of rice grain types, which plays a vital role in improving agricultural planning, biodiversity preservation, and sustainable farming.
- The project employs **Transfer Learning** using the **MobileNetv4 architecture**, adapted to classify images of rice grains into five different rice types.
- The system accepts uploaded rice grain images from users including farmers, agricultural scientists, and hobbyists.
- The model processes the image through a **Convolutional Neural Network (CNN)** pipeline enhanced by MobileNetv4 to predict the most probable rice type.
- The architecture includes stages such as image preprocessing, model inference, prediction display, and user feedback. It also allows iterative retraining with new images to improve accuracy.
- Deployment is targeted via a **web-based interface** using frameworks such as **Flask** or **Streamlit**, hosted on cloud platforms like **Google Colab** or **Heroku** for ease of access

Example - Solution Architecture Diagram:

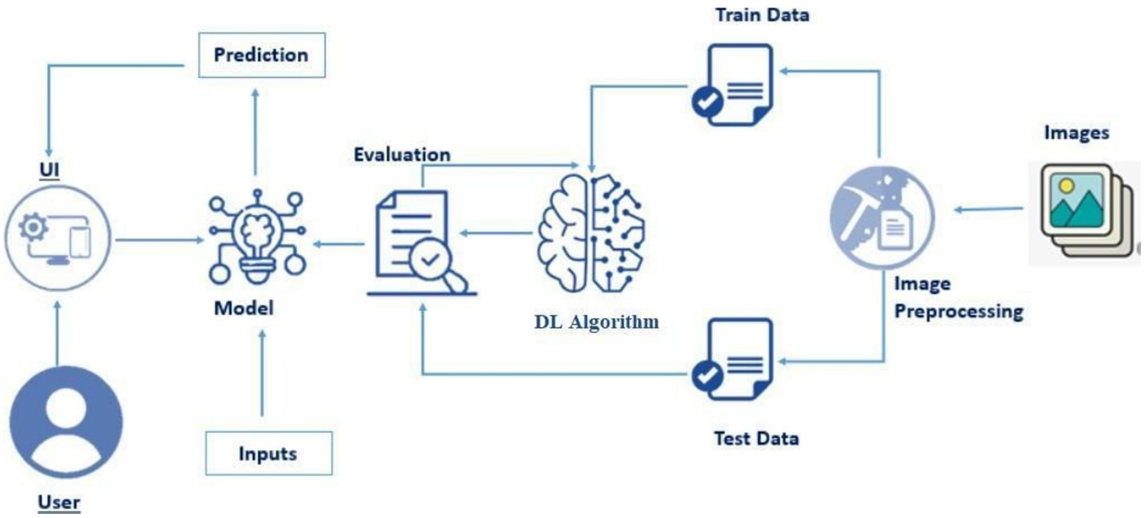

Figure 1: Rice Type Classification Through Transfer Learning