Project Design Phase
Solution Architecture

Date	30 June 2025
Team ID	LTVIP2025TMID46945
Project Name	Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management
Maximum Marks	4 Marks

Solution Architecture:

- **Data Collection**

  Gather poultry disease images from reliable datasets and field sources (multiple disease classes).

  Preprocess images (resize, normalize, augment) to improve model performance.

- **Model Selection (Transfer Learning)**

  Use a pre-trained CNN model (e.g., ResNet50, MobileNet) as the base.

  Fine-tune the model on the poultry disease dataset for specific classification tasks.

- **Model Training & Evaluation**

  Split data into training, validation, and testing sets.

  Train the model and evaluate using metrics like accuracy, precision, recall, and F1 score.

- **Mobile App Development**

  Build a user-friendly Android mobile application interface.

  Allow users to capture or upload images of infected poultry.

- **Model Integration**

  Convert and integrate the trained model using TensorFlow Lite (or ONNX) for mobile deployment.

  Ensure fast, low-latency inference on mobile devices.

- **Offline Functionality**

  Enable model inference to work without internet access.

  Store minimal resources locally for use in remote areas.

- **User Feedback & Output Display**

  Display disease prediction with confidence score and recommended actions.

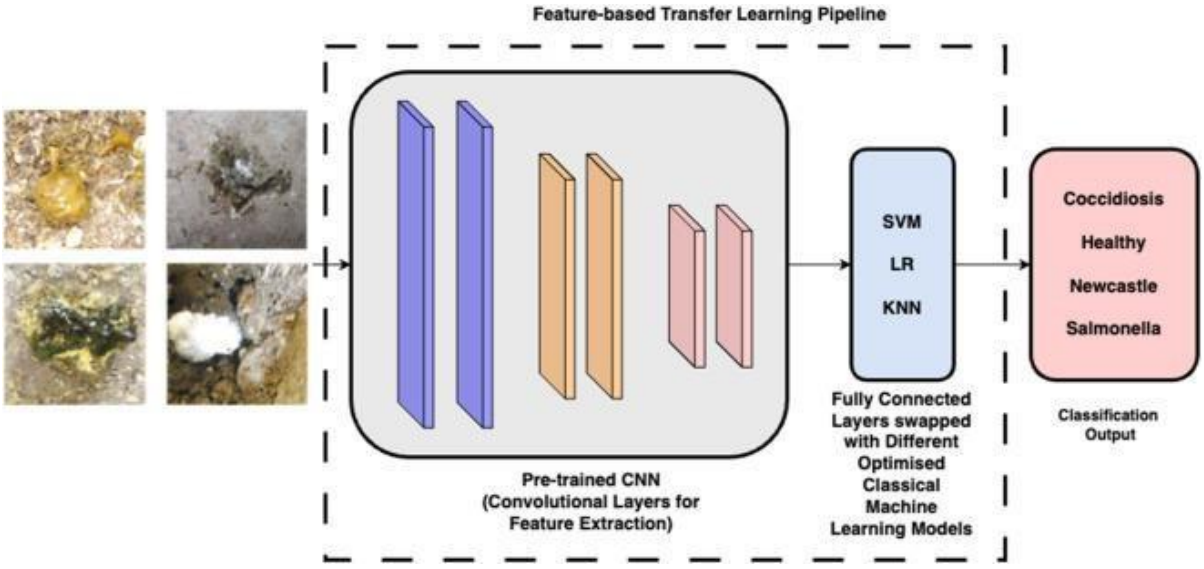
Allow farmers to view diagnosis history and optionally upload images for retraining (if online).

- **Scalability & Updates**

  Design architecture to allow model retraining and updates with new data.

  Include potential cloud sync when internet is available for future enhancements.

Example - Solution Architecture Diagram:



Aritecture Overview:

The architecture of this project integrates AI-powered disease detection with a mobile-first approach tailored for rural poultry farmers. It begins with collecting and preprocessing poultry disease images, which are then used to train a deep learning model using transfer learning (e.g., ResNet50 or MobileNet). The trained model is optimized and converted into a lightweight format like TensorFlow Lite for mobile deployment. A user-friendly mobile application is developed to allow farmers to capture or upload images of affected poultry. The app runs the model locally, enabling offline disease classification and displaying predictions along with suggested actions. This architecture ensures real-time, low-cost, and accessible disease diagnosis, even in areas with limited internet access, and supports future scalability through periodic model updates.