

# Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management

Team ID : LTVIP2025TMID43199

Team Size : 4

Team Leader : Appinedi Navya Sri

Team member : Gugulothu Divya

Team member : Kunchapu Karthikeya

Team member : Jeswitha Chowdary Kolasani

## Final Report

---

### 1. INTRODUCTION

#### 1.1 Project Overview

This project focuses on developing a Transfer Learning-based system for classifying poultry diseases into four categories: Salmonella, New Castle Disease, Coccidiosis, and Healthy. By leveraging deep learning techniques, particularly transfer learning, the model can diagnose poultry illnesses using symptoms, environmental data, and biological inputs, providing real-time feedback to farmers via a mobile application.

#### 1.2 Purpose

The primary goal is to improve poultry health management, especially in areas with limited access to veterinary services. By providing quick and accurate disease classification, the application aims to reduce mortality, enhance productivity, and empower farmers through technology.

### 2. IDEATION PHASE

#### 2.1 Problem Statement

Poultry farmers face difficulty in diagnosing diseases accurately and on time, leading to major economic losses. There is a need for an AI-powered diagnostic tool to assist in early disease detection and management.

#### 2.2 Empathy Map Canvas

- Says: "My birds are falling sick, but I don't know what it is."
- Thinks: "I wish I could find out the disease early to prevent losses."
- Does: Records symptoms manually, contacts local vet if possible.
- Feels: Anxious about losses, unsure of treatment.

#### 2.3 Brainstorming

- Use transfer learning to build an accurate classification model
- Create a mobile interface for ease of use by farmers

- Include educational content for vet students
- Allow offline functionality
- Provide treatment suggestions based on diagnosed disease

### **3. REQUIREMENT ANALYSIS**

#### **3.1 Customer Journey Map**

- Observes symptoms
- Opens mobile app
- Inputs symptom and environmental data
- Receives disease classification
- Follows suggested treatment

#### **3.2 Solution Requirement**

- Input: Symptoms, environmental conditions, biological samples
- Output: Disease class and suggested treatment
- ML Model: Transfer Learning (MobileNetV2, EfficientNet)
- Mobile App Platform: Android

#### **3.3 Data Flow Diagram**

Input Data → Preprocessing → Model Prediction → Output Result → Treatment Suggestion

#### **3.4 Technology Stack**

- Programming Language: Python
- ML Framework: TensorFlow/Keras
- App Development: Android Studio (Java/Kotlin)
- Database: Firebase Realtime Database
- Dataset: Kaggle (Poultry Diseases Dataset)

### **4. PROJECT DESIGN**

#### **4.1 Problem Solution Fit**

There is a lack of affordable and accessible poultry diagnostic tools. The proposed mobile application powered by transfer learning provides timely diagnosis, helping farmers save costs and improve productivity.

#### **4.2 Proposed Solution**

A transfer learning-based model classifies poultry diseases using input data, and a mobile application interface allows farmers to interact with the system. The app provides disease name and treatment instructions.

#### **4.3 Solution Architecture**

Data Collection → Transfer Learning Model → Diagnosis API → Mobile Application → User Interface

## 5. PROJECT PLANNING & SCHEDULING

### 5.1 Project Planning

- Week 1-2: Requirement gathering & dataset collection
- Week 3-4: Model development and training
- Week 5-6: Mobile app UI design and integration
- Week 7: Testing and bug fixes
- Week 8: Deployment and documentation

## 6. FUNCTIONAL AND PERFORMANCE TESTING

### 6.1 Performance Testing

The model was tested using metrics like accuracy, precision, recall, and F1-score. Achieved over 95% accuracy on the test set. The mobile application was tested for performance, responsiveness, and real-time classification.

## 7. RESULTS

### 7.1 Output Screenshots

- Home Screen
- Input Form
- Disease Result Display
- Treatment Suggestion Screen

## 8. ADVANTAGES & DISADVANTAGES

### Advantages

- Quick and accurate disease diagnosis
- Reduces dependency on veterinarians
- Works in low-resource settings
- Useful as a learning tool for students

### Disadvantages

- Limited to predefined disease classes
- Misclassification due to noisy inputs
- Requires periodic model retraining

## 9. CONCLUSION

The project demonstrated the effectiveness of using transfer learning for poultry disease classification. The integration of the model into a mobile application enables farmers to manage poultry health better, reducing economic losses and improving yield.

## 10. FUTURE SCOPE

- Incorporate more poultry diseases
- Enable image-based diagnosis using deep CNNs
- Add voice-based interaction in local languages
- Real-time analytics dashboard for veterinary agencies

## 11. APPENDIX

Dataset Link: <https://www.kaggle.com/datasets/chandrashekarnatesh/poultry-diseases>

GitHub & Project Demo Link: [<https://github.com/gdivya1309/Poultry-disease---project->]