

Project Design Phase-II Technology Stack

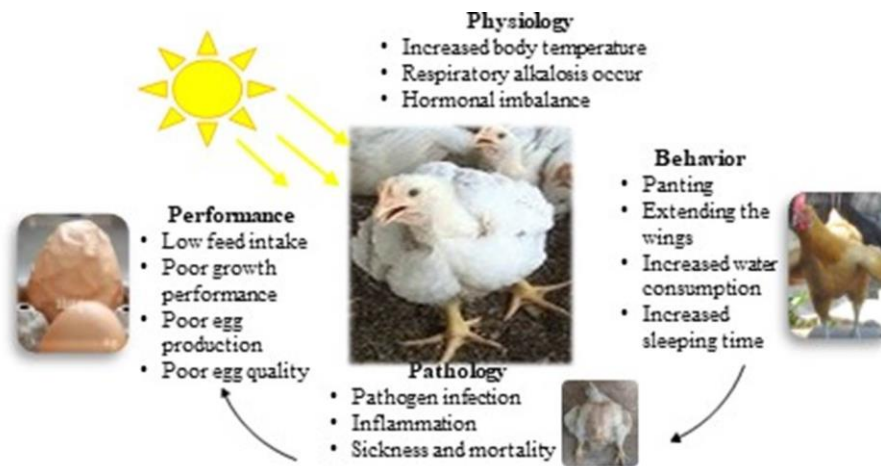
Date	25 Jun 2025
Team ID	LTVIP2025TMID33049
Project Name	Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management
Maximum Marks	4 Marks

Technical Architecture:

Poultry Disease Detection in Remote Areas with Offline Mode Access

farmers to upload poultry images and get disease predictions using an embedded AI model (offline) or cloud server (online). Key components include a mobile app, transfer learning model (e.g., MobileNetV2), local storage, and optional cloud support.

Reference: <https://www.fao.org/4/al729e/al729e00.pdf>



Guidelines:

Clearly define all processes and technology blocks:

Include modules for image upload, disease prediction using AI, result display with confidence score, and history tracking.

Separate local and cloud infrastructure:

Offline mode uses a locally embedded TensorFlow Lite model and SQLite for storage, while online mode uses Firebase for authentication and cloud backups.

Highlight external interfaces (third-party APIs):

Use Firebase Authentication for login, and optionally integrate translation APIs for multilingual support.

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Mobile application for farmers to upload images and view results	Android (Java/Kotlin), XML Layout
2.	Application Logic-1	Image validation, form handling, UI logic	Java / Kotlin
3.	Application Logic-2	AI model integration and inference logic	Python (TensorFlow Lite)
4.	Application Logic-3	Disease info display, confidence calculation, offline/online mode switch	Kotlin / Java
5.	Database	Stores image history, prediction logs offline	SQLite
6.	Cloud Database	Stores user data, image records online (if connected)	Firebase Firestore (NoSQL)
7.	File Storage	Stores user-uploaded images and model files	Local File System (Offline), Firebase Cloud Storage
8.	External API-1	Language translation API for multilingual interface (optional)	Google Translate API
9.	External API-2	Weather-based disease correlation optional feature	Weather Stack API or Open Weather API
10.	Machine Learning Model	Detect poultry disease from uploaded images	MobileNetV2 / Exception (Transfer Learning)
11.	Infrastructure (Server / Cloud)	App hosted on mobile; optional cloud model API for online access	Local (Mobile), Firebase Cloud Functions

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Used for app development and model training	Android SDK, TensorFlow Lite, Python
2.	Security Implementations	User authentication, data encryption, and secure cloud storage	Firebase Authentication, SHA-256, HTTPS
3.	Scalable Architecture	Supports model updates and multiple user growth (modular AI + cloud optional)	Modular ML design, Cloud Sync (Firebase)
4.	Availability	Offline access with fallback to cloud sync when internet returns	Offline-first app design, Firebase services
5.	Performance	Prediction within 2–3 seconds, lightweight AI model for mobile efficiency.	TensorFlow Lite, Low-latency image pipeline

References:

https://www.tj.kyushu-u.ac.jp/evergreen/contents/EG2024-11_1_content/pdf/pp314-330.pdf

<https://www.numberanalytics.com/blog/advanced-poultry-health-management>

<https://www.mdpi.com/2076-2615/11/3/900>

<https://www.slideshare.net/VishalPandey26/health-management-in-poultry>

<https://www.sciencedirect.com/science/article/pii/S0032579120305496>