

## Project Design Phase-II Technology Stack (Architecture & Stack)

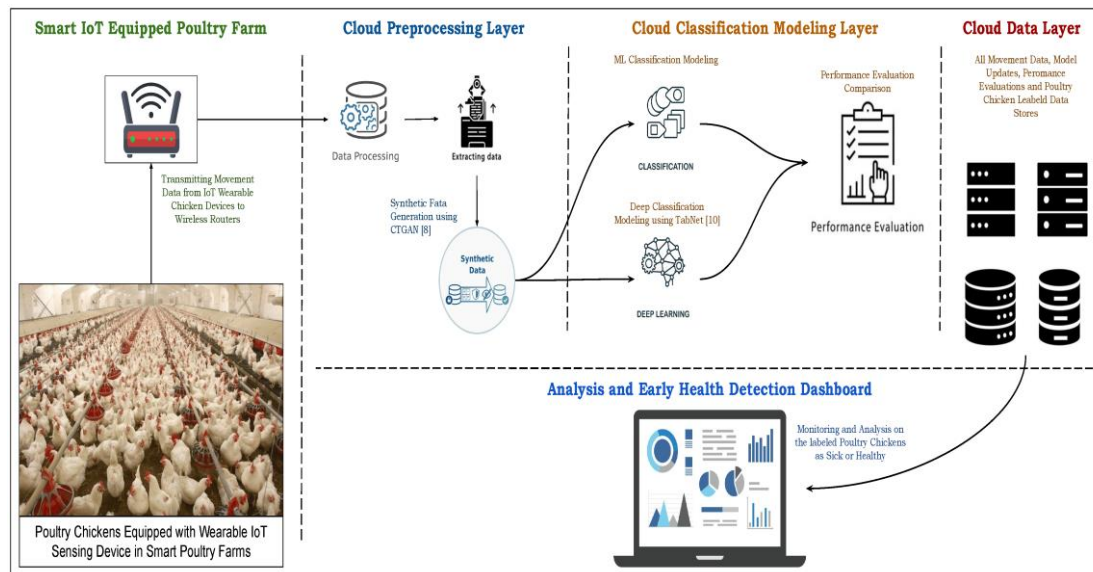
Date	28 June 2025
Team ID	LTVIP2025TMID41715
Project Name	Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management
Maximum Marks	4 Marks

### Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Example: Order processing during pandemics for offline mode**

**Reference:** <https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/>



### Guidelines:

- Include all the processes (As an application logic / Technology Block)
- Provide infrastructural demarcation (Local / Cloud)
- Indicate external interfaces (third party API's etc.)
- Indicate Data Storage components / services
- Indicate interface to machine learning models (if applicable)

**Table-1 : Components & Technologies:**

<b>S.No</b>	<b>Component</b>	<b>Description</b>	<b>Technology</b>
<b>1.</b>	<b>User Interface</b>	Mobile & Web App for uploading images and receiving results.	Flutter / React JS, HTML, CSS
<b>2.</b>	<b>Application Logic-1</b>	Image upload & pre-processing pipeline	Python(Flask/FastAPI)
<b>3.</b>	<b>Application Logic-2</b>	Disease classification using Transfer Learning	Python + TensorFlow/Keras (ResNet50 / MobileNetV2)
<b>4.</b>	<b>Application Logic-3</b>	Notification & advisory generation engine	Python + Twilio / Firebase
<b>5.</b>	<b>Database</b>	Metadata, farmer profiles, and logs	PostgreSQL / SQLite
<b>6.</b>	<b>Cloud Database</b>	Cloud-hosted version for scalability	Firebase Realtime DB / Google Cloud SQL
<b>7.</b>	<b>File Storage</b>	Image Storage	Firebase Storage / AWS S3
<b>8.</b>	<b>External API-1</b>	Weather API to correlate with disease conditions	OpenWeatherMap API
<b>9.</b>	<b>External API-2</b>	Vet directory or agricultural database integration	Krishi Vigyan Kendra APIs / Gov APIs
<b>10.</b>	<b>Machine Learning Model</b>	Disease classifier using transfer learning	ResNet50, MobileNetV2 with fine-tuned poultry dataset
<b>11.</b>	<b>Infrastructure (Server / Cloud)</b>	Hybrid deployment	Firebase Cloud / Google Cloud Functions / Local fallback

**Table-2: Application Characteristics:**

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	TensorFlow, Keras, Flask, React	Python, Java Script
2.	Security Implementations	User authentication, secure uploads, and API control	Firebase Auth, HTTPS, IAM roles, OAuth2.0
3.	Scalable Architecture	Microservices + serverless for core services	Firebase Functions, Docker, REST APIs
4.	Availability	High uptime with cloud-hosted services and regional data distribution	Load balancing (GCP), CDN, auto-scaling
5.	Performance	Optimized image pipeline, CDN	TensorRT (optional), Cloud CDN, Redis

**References:**

<https://c4model.com/>

<https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/>

<https://www.ibm.com/cloud/architecture>

<https://aws.amazon.com/architecture>

<https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d>