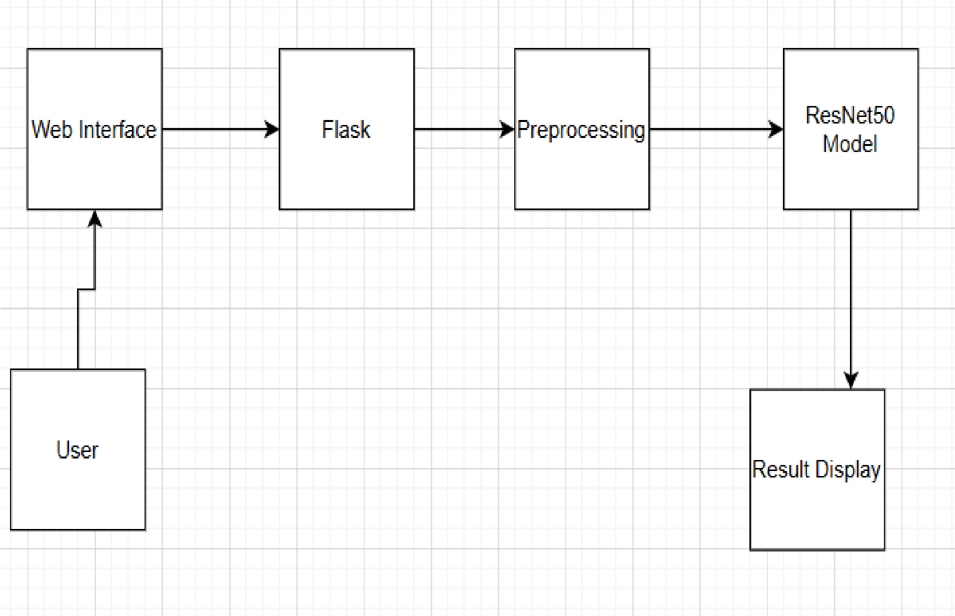
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	27 June 2025
Team ID	LTVIP2025TMID20259
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:



Guidelines:

Include all processes:

- Image upload, preprocessing, prediction, result display

Show infrastructural boundaries:

- Frontend (Local), Backend & Model (Cloud / Streamlit Cloud / Heroku)

Indicate external interfaces:

- Optional APIs for alerts (e.g., Twilio) or translation (Google API)

Highlight data storage components:

- Image and result storage (Local or Cloud File Storage)

Indicate ML model interface:

- ResNet50 model (via TensorFlow/Keras) integrated through

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI for uploading poultry images and viewing predictions.	HTML, CSS, Flask.
2.	Application Logic-1	Image preprocessing before prediction	Python ,OpenCV
3.	Application Logic-2	Model loading and inference logic	TensorFlow, Keras (ResNet50)
4.	Application Logic-3	Display disease name	Python, Flask
5.	Database (optional)	Storing uploaded image metadata and results (optional)	SQLite / MySQL
6.	Cloud Database(optional)	Optional remote storage and backup	Firebase / AWS S3
7.	File Storage(optional)	Store uploaded poultry images locally or in cloud	Local filesystem / Google Cloud Storage
8.	External API-1(optional)	Send notifications or alerts to farmers	Twilio API / SendGrid
9.	External API-2(optional)	Translate or read out results in regional languages	Google Translate API / Text-to-Speech API
10.	Machine Learning Model(optional)	Classifies poultry disease using pre-trained model	ResNet50 via Keras / TensorFlow
11.	Infrastructure (Server / Cloud) (optional)	Hosting application and AI model	Streamlit Cloud / Heroku / AWS EC2

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Uses widely available open-source tools and libraries	TensorFlow, Keras, Flask,OpenCV
2.	Security Implementations	Input validation for image uploads, HTTPS enabled deployment, file type checks	SHA-256, Flask-Login, HTTPS, reCAPTCHA (optional)
3.	Scalable Architecture	Can be containerized and deployed on cloud,	Docker, Streamlit Cloud / AWS Elastic

S.No	Characteristics	Description	Technology
		supports scaling for increased traffic	Beanstalk
4.	Availability	Hosted on a cloud platform to ensure 24/7 access and low downtime	Streamlit Cloud / Heroku
5.	Performance	Optimized model for fast inference; average prediction under 3–5 seconds; model cached on server	Flask, TensorFlow, Model Caching (joblib/pickle)

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