

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

Date	26 June 2025
Team ID	LTVIP2025TMID43759
Project Name	Hematovision – Advanced Blood Cell Classification using Transfer Learning
Maximum Marks	4 Marks

Technical Architecture:

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

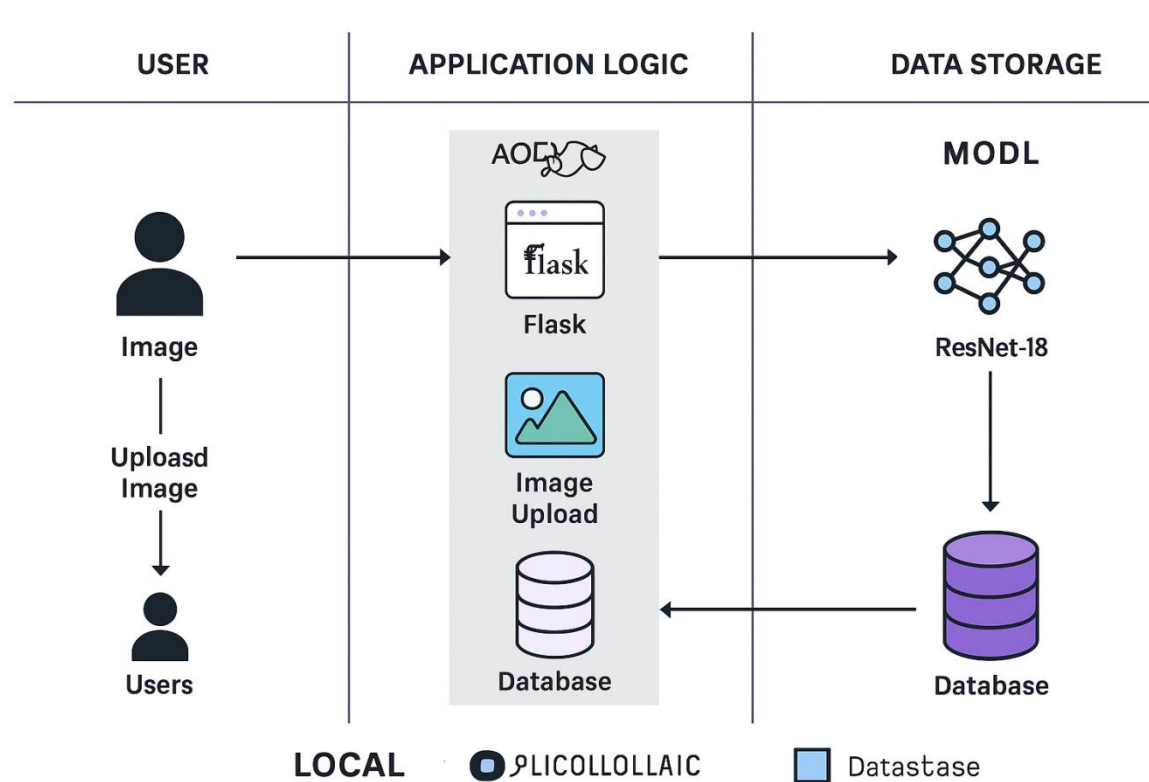


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web interface where users upload Blood Cell images	HTML, CSS, JavaScript
2.	Application Logic-1	Backend logic for handling image upload and routing	Python(Flask Framework)
3.	Application Logic-2	N/A (Not using speech-to-text)	-
4.	Application Logic-3	N/A (Not using speech-to-text)	-
5.	Database	Store image metadata and prediction results	SQLite (local), can scale to PostgreSQL
6.	Cloud Database	Not used in local setup (future scope: Firebase / AWS DynamoDB)	-
7.	File Storage	Store uploaded images locally	Local filesystem (uploads/)
8.	External API-1	Optional integration for weather-related poultry insights	OpenWeatherMap API (Future Scope)
9.	External API-2	Not applicable	-
10.	Machine Learning Model	Image classification using pretrained MobileNetV2 model	PyTorch + ResNet-18
11.	Infrastructure (Server / Cloud)	Application hosted and tested locally using Flask server	Localhost (127.0.0.1:5000).

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Backend and model based on open-source tools	Flask, PyTorch, NumPy, OpenCV
2.	Security Implementations	Validating file uploads, restricting extensions, local session handling	File type validation, Flask-CORS (optional)
3.	Scalable Architecture	Modular logic allows upgrade to microservices and cloud deployment	3-tier architecture (UI - Logic - Storage)
4.	Availability	Local setup for now; can be made highly available using containerization	Docker (future), Flask
5.	Performance	Lightweight model (ResNet-18), fast image inference (<3s per request)	PyTorch with GPU/CPU acceleration