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

Date	29 June 2025
Team ID	LTVIP2025TMID46471
Project Name	Hematovision : advanced blood cell classification using transfer learning
Maximum Marks	4 Marks

🏗️ Technical Architecture:

This project implements an AI-based blood cell classification system that uses deep learning and transfer learning to automate the identification of different types of white blood cells. The architecture supports image ingestion, preprocessing, model prediction, and Flask-based deployment to assist medical professionals with diagnostics.

📌 Architecture Overview:

1. 1. Image Ingestion (Microscopic cell images in JPEG format)
2. 2. Data Preprocessing & Augmentation (TensorFlow, Keras)
3. 3. Model Building using Transfer Learning (MobileNetV2 + Dense layers)
4. 4. Model Evaluation & Export (Saved as bloodell.h5)
5. 5. Flask Web App for Image Upload & Prediction (HTML, Flask, TensorFlow)
6. 6. Deployment Readiness (GitHub + Local Testing)

Table-1: Components & Technologies

S.No	Component Description	Technology
1	User Interface – image upload & result view	HTML, Bootstrap

2	Application Logic – image preprocessing & prediction	Python, TensorFlow, Keras
3	Model – blood cell classification	MobileNetV2 (Transfer Learning), Dense layers
4	Storage – model and sample images	Local .h5 file, static/uploads folder
5	Framework – backend web server	Flask
6	Development Environment	Google Colab, Jupyter Notebook
7	Hosting & Deployment	Localhost (Flask), GitHub (project source)

Table-2: Application Characteristics

S.No	Characteristics Description	Technology / Tools Used
1	Open-Source Frameworks	TensorFlow, Keras, Flask
2	Security Considerations	Local image storage, no external API exposure
3	Scalable Design	Easily extendable with new model versions and datasets
4	Availability	Web interface available 24/7 on localhost or web host
5	Performance	Efficient MobileNetV2 architecture with GPU support

References:

https://c4model.com/

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