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

Date	27 June 2025
Team ID	LTVIP2025TMID59868
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

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

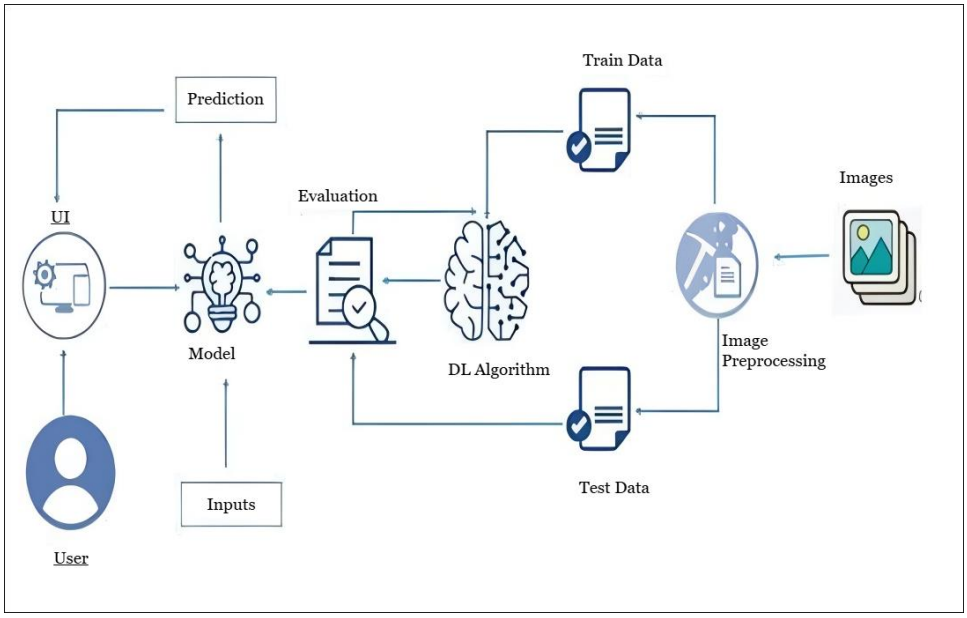

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	How users interact (image upload + result view)	HTML, CSS, Bootstrap 5
2	Application Logic-1	Uploading, preprocessing & Flask backend routing	Python, Flask
3	Application Logic-2	AI model integration and inference	TensorFlow, Keras
4	Application Logic-3	Image handling, resizing, encoding	OpenCV, NumPy
5	Database	No database used (flat file-based handling)	NA
6	Cloud Database	NA – Local Execution	NA
7	File Storage	Temporary image storage for session	Local Filesystem (static folder)
8	External API-1	NA – All internal logic	NA
9	External API-2	NA – No external API used	NA
10	Machine Learning Model	To classify blood cell image (transfer learning)	MobileNetV2 (Keras, pretrained on ImageNet)
11	Infrastructure	Runs on local device via Anaconda or localhost Flask	Local Server (127.0.0.1:5000)

Table-2: Application Characteristics:

S.No	Characteristic	Description	Technology Used
1	Open-Source Frameworks	Entirely built on open frameworks	Flask, TensorFlow, OpenCV, NumPy, Bootstrap
2	Security Implementations	File validation, no arbitrary script execution, local-only access	Flask Security, basic file checks
3	Scalable Architecture	MVC architecture using Flask separation of layers	Flask MVC architecture
4	Availability	Can be extended to cloud or batch uploads	Render, Heroku or Docker-ready design
5	Performance	Model runs < 2 seconds; preprocessing optimized using NumPy/OpenCV	Pre-trained MobileNetV2, vectorized inference

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