Project Design Phase

Problem – Solution Fit Template

Date	20 January 2026
Team ID	LTVIP2026TMIDS76912
Project Name	HematoVision: Advanced Blood Cell Classification Using Transfer Learning
Maximum Marks	2 Marks

Problem – Solution Fit – HematoVision

- Develop an AI-based blood cell classification system using transfer learning.

- Use a pre-trained CNN model (e.g., VGG16/ResNet) for feature extraction and accurate multi-class classification.

- Apply data preprocessing and augmentation to improve model generalization.

- Train, evaluate, and optimize the model using performance metrics like accuracy, precision, recall, and F1-score.

- Integrate the trained model with a Flask web application for real-time image upload and prediction.

- Display classification results along with confidence scores through a simple user interface.

Purpose of the Solution

- Reduce manual workload of pathologists and lab technicians.

- Minimize human error in blood cell classification.

- Provide fast and consistent diagnostic support.

- Improve accessibility to automated diagnostic tools in remote or resource-limited settings.

HematoVision – Problem/Solution Canvas

1. CUSTOMER SEGMENTS (CS)

Healthcare professionals, lab technicians, pathologists, hospitals, diagnostic labs

6. CUSTOMER CONSTRAINTS (CC)

Limited time for manual analysis, shortage of experts, human error, need for fast results

5. AVAILABLE SOLUTIONS (AS)

Manual microscopy, lab software, traditional hematology analysis tools

2. JOBS-TO-BE-DONE / PROBLEMS (J&P)

Need quick and accurate blood cell classification from images for diagnosis

9. PROBLEM ROOT CAUSE (RC)

Manual counting is slow, subjective, and depends on skilled personnel

7. BEHAVIOUR (BE)

Lab staff manually observe slides, record counts, verify results

3. TRIGGERS (TR)

Need faster diagnosis, increasing lab load, AI adoption in medical imaging

10. YOUR SOLUTION (SL)

HematoVision: AI web app using CNN (VGG16 transfer learning) to classify blood cell images and provide instant results with confidence scores

8. CHANNELS OF BEHAVIOUR – ONLINE (CH)

Web application, hospital systems, telemedicine platforms

4. EMOTIONS BEFORE / AFTER (EM)

Before: slow, uncertain results
After: fast, confident AI-assisted analysis

8. CHANNELS OF BEHAVIOUR – OFFLINE (CH)

Lab microscope image capture and upload through HematoVision interface