Project Design Phase

Proposed Solution Template

Date	28 JUNE 2025
Team ID	LTVIP2025TMID43759
Project Name	HematoVision: Advanced Blood Cell Classification Using Transfer Learning
Maximum Marks	4 Marks

Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Manual classification of blood cells under the microscope is time-consuming and prone to errors, particularly in busy pathology labs. Accurate cell identification is crucial for diagnosing diseases like leukemia, infections, or allergies. Faster, automated solutions are needed for better patient outcomes.
2.	Idea / Solution description	We propose HematoVision, an AI-based blood cell classification system using transfer learning models (e.g., ResNet, EfficientNet). Medical staff can upload cell images via a web app, and the system will predict the cell type (Neutrophil, Lymphocyte, Monocyte, Eosinophil) with confidence scores to assist diagnostics.
3.	Novelty / Uniqueness	Uses advanced deep learning for high accuracy. Reduces dependence on manual microscopy. Trained on a specific dataset of blood cell images. Designed for easy adoption by labs without complex hardware.

		Potential to expand to detect abnormal/malignant cells in future versions.
4.	Social Impact / Customer Satisfaction	Improves speed and accuracy of diagnoses. Reduces workload of lab technicians. Helps early detection of blood-related disorders. Improves healthcare quality. Empowers healthcare facilities with advanced diagnostic tools.
5.	Business Model (Revenue Model)	Freemium model: free basic predictions, paid advanced reports. Licensing to hospitals, diagnostic labs, or health-tech firms. Subscription-based access for larger institutions. Potential partnerships with medical device companies. API services for integration into existing lab systems.
6.	Scalability of the Solution	Easily deployable on local hospital systems or cloud. Expandable to classify more cell types (e.g., blasts in leukemia). Scalable to integrate into Electronic Health Record systems. Adaptable to multiple languages and regions. Suitable for small labs or large hospitals.