Project Initialization and Planning Phase

Date	05 July 2025
Team ID	SWTID1749835721
Project Title	Hematovision: Advanced Blood Cell Classification Using Transfer Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) report

The proposal report aims to transform blood cell analysis using deep learning and transfer learning, enabling highly accurate and efficient classification of blood cell types. This innovation tackles diagnostic challenges in hematology and paves the way for faster and more reliable medical support systems. Key features include a convolutional neural network-based classifier and an interactive interface for real-time predictions.

Project Overview	
Objective	The primary objective is to revolutionize blood cell classification by leveraging transfer learning techniques to enhance diagnostic accuracy and speed in medical imaging analysis.
Scope	The project aims to build an advanced classification system for different types of blood cells. It will assist medical professionals in identifying anomalies, reducing human error, and improving diagnostic workflows in hematology labs.
Problem Statement	
Description	Traditional blood cell classification relies heavily on manual examination under microscopes, which is time-consuming, labor-intensive, and prone to errors due to human fatigue or lack of expertise. This limits the efficiency and reliability of hematological diagnoses.
Impact	Addressing these issues with an AI-powered system will enhance diagnostic precision, reduce turnaround times, and support overburdened medical staff. Ultimately, it contributes to better patient care and operational efficiency in healthcare settings.
Proposed Solution	
Approach	Employing machine learning techniques and using MobileNetV2 as a base to analyze and predict and classify different types of blood cells.
Key Features	Transfer learning using **MobileNetV2** for lightweight and fast classification.

	Custom CNN model for enhanced feature extraction and accuracy. Flask web application interface for real-time predictions and ease of use. Visualization tools to assist medical staff in interpreting model outputs.

Resource Requirement

Resource Type	**Description**	**Specification/Allocation**
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy, matplotlib, seaborn
Development Environment	IDE	Google colab, VS code
Data		
Data	Source, size, format	Kaggle blood cell datasets (e.g., BCCD), images in JPEG/PNG format