Project Design Phase
Problem – Solution Fit Template

Date	28 june 2025
Team ID	LTVIP2025TMID60119
Project Name	Hematovision
Maximum Marks	2 Marks

Problem – Solution Fit Template:

Manual microscopic analysis of blood cells is a time-consuming and error-prone process that relies heavily on the expertise and availability of trained pathologists. In many rural and resource-limited healthcare settings, there is a shortage of skilled technicians, which further delays accurate diagnosis and patient care. Additionally, even experienced professionals can misclassify cells due to fatigue, leading to inconsistent results. The traditional approach is not scalable, particularly in emergency scenarios or during large-scale testing when speed and reliability are critical.

HematoVision addresses these challenges by offering an AI-powered blood cell classification system built using transfer learning techniques. Leveraging pre-trained models like EfficientNet, the system quickly and accurately identifies various blood cell types, including red blood cells, white blood cells, and platelets. With a simple and user-friendly web interface built on Flask, the tool enables even non-experts to upload microscope images and receive predictions with high confidence in seconds. This significantly reduces the time and effort required for diagnosis, ensures consistency, and scales efficiently without the need for expensive equipment or extensive training. HematoVision presents a practical, cost-effective, and scalable solution that fits seamlessly into modern laboratory workflows and can transform hematology diagnostics, especially in underserved regions.

Purpose:

The purpose of the HematoVision project is to develop an AI-powered system that can automatically classify blood cells from microscope images using transfer learning techniques. This project aims to assist medical professionals—especially in resource-constrained environments—by providing a fast, accurate, and consistent method to identify blood cell types such as red blood cells, white blood cells, and platelets.

By integrating deep learning with a user-friendly web interface, HematoVision seeks to reduce dependency on manual analysis, minimize human error, and accelerate diagnostic workflows in clinical laboratories. The project also promotes accessible and cost-effective healthcare technology by making advanced image classification usable even in rural and remote settings.

1A CUSTOMER SEGAENT(S)	CUSTOMER CONSTRINCTS	% AVAILABLE SOLUTI(ONS	8.P GROWTH SOLLTION
• Patholol0gists and lab technicians • Diagnostic centers and educators • Rural healthcare workers	• Pathologists, and lab technicians • Diagnostic centers and hospitals • Medical students and educators • Rural healthcare workers	• Manual classification via microscope • Paper-based or Excel blood count tracking • Commercial diagnostic equipment (costly)	• Ceadsty'clood EeKcamples crimical and accurately • Reduce time spent on a manual examination • Increase diagnostic accuracy on const • Automatic cell reogchitlon

10. TRIGGERS	BE BEHAVIOUR	SL YOUR SOLUTION	SL YOUR SOLUTION
• igh volume of blood amples in the lab • aperbased or Excel tood count tracking • nline academic tools • on-integrated, limiteᴅ	• High volune.fblood samples in tab • Fatique or misclassification • Store blood images on local drives and paper or speead at • Record findings in paper or spread ets	HematVision uses deep learning and transfer learning to automatically classity bluob cel from microscope images	Hemattivision uses deep.learning.and fransfor learning to automatically classity blood cells from microscope images • Providing tast accurate-preotutes • With a simple web interface, save time and reducing human error