Project Design Phase
Proposed Solution

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

Proposed Solution :

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	HematoVision aims to solve these challenges by developing an AI-powered system that uses transfer learning with pre-trained CNNs to classify blood cells accurately and efficiently. This system minimizes diagnostic delays, reduces human error, and provides scalable diagnostic support, especially in telemedicine and educational contexts.
2.	Idea / Solution description	HematoVision is an AI-powered solution designed to automate the classification of blood cells from microscope images using advanced transfer learning techniques. The core idea is to leverage pre-trained convolutional neural network (CNN) models—such as EfficientNet or ResNet—and fine-tune them with a dataset of labeled blood cell images to achieve high classification accuracy. These models can identify and distinguish between different types of blood cells, including Red Blood Cells (RBCs), White Blood Cells (WBCs), and Platelets.
3.	Novelty / Uniqueness	HematoVision is unique in combining deep learning accuracy with real-world usability. Unlike traditional diagnostic tools, it leverages transfer learning with models like EfficientNet to achieve fast and precise blood cell classification even with limited data. Its integration into a simple web interface makes it accessible to non-experts, including lab staff in rural areas. The project stands out for its scalability, low-cost deployment, and future potential for explainability (Grad-CAM) and mobile health applications, making it a novel and practical AI solution for digital hematology.
4.	Social Impact / Customer Satisfaction	HematoVision empowers healthcare systems by making accurate blood cell classification faster, more accessible, and cost-effective—

		especially in rural and underserved areas. By reducing the burden on pathologists and minimizing diagnostic errors, it improves patient outcomes and speeds up treatment decisions. The user-friendly interface ensures that even non-experts can operate the system with ease, leading to high customer satisfaction. HematoVision contributes to equitable healthcare access, supporting national goals of digital and AI-integrated medical services.
5.	Business Model (Revenue Model)	**HematoVision** follows a **B2B (Business-to-Business)** model targeting clinics, diagnostic labs, and healthcare institutions. Revenue can be generated through multiple channels: • **Software-as-a-Service (SaaS):** Monthly or yearly subscription for access to the web-based blood cell classification tool. • **One-Time Licensing:** Hospitals or labs can purchase a lifetime license for offline or on-premise deployment. • **Pay-per-Use Model:** Small clinics or remote centers can pay per image processed, making it affordable and scalable. • **Mobile App (Future Scope):** A freemium mobile version with basic features, and premium options for AI reporting and offline use. • **Customization Services:** Revenue from personalized integrations with hospital management systems (HMS) or digital microscopes.
6.	Scalability of the Solution	**HematoVision** is designed to be highly scalable across both technical and geographical dimensions. Technically, the use of **transfer learning** allows the model to be trained or fine-tuned with new data, enabling expansion to more blood cell types or diseases (e.g., malaria, leukemia). The Flask-based web app can be **hosted on cloud platforms** for global access or **converted to a mobile app** using TensorFlow Lite for offline use in rural areas. Functionally, HematoVision can be scaled from **small clinics** to **large hospitals** by adjusting usage models—from single-user deployments to high-volume API integrations. Its modular architecture supports easy integration with **digital microscopes, hospital management systems (HMS), and lab information systems (LIS)**.

| | | the solution is **flexible, low-cost, and adaptable**, making it suitable for widespread deployment across diverse healthcare environments. |