

Project Design Phase
Problem – Solution Fit Template

Date	24 June 2025
Team ID	LTVIP2025TMID35409
Project Name	HematoVision: Advanced Blood Cell Classification Using Transfer Learning
Maximum Marks	2 Marks

Problem – Solution Fit Template:

HematoVision addresses a critical gap in the healthcare diagnostics domain—the **need for fast, accurate, and accessible blood cell classification**. In many clinics and diagnostic labs, especially in resource-constrained settings, **manual microscopy** remains the norm. This approach is **time-consuming**, depends heavily on expert availability, and is susceptible to **human error**, which can delay diagnosis and affect treatment outcomes.

By applying **transfer learning with MobileNetV2**, HematoVision automates the classification of blood cells (eosinophils, lymphocytes, monocytes, and neutrophils) with high precision. This AI-powered solution **reduces diagnostic time**, supports overburdened pathologists, and enhances diagnostic accuracy—even in clinics with **minimal infrastructure**.

Customers such as **medical labs, hospitals, and research institutions** benefit by streamlining their workflows, reducing error margins, and enabling early detection of blood-related disorders. The solution fits seamlessly into existing lab setups and is deployable via a **Flask-based web application**, making it **cost-effective and user-friendly**.

Ultimately, HematoVision delivers a **problem-solution fit** by aligning clinical needs with an intelligent, scalable, and accessible technology—enhancing healthcare delivery where it's needed most.

Template:

Problem-Solution fit canvas 2.0		Purpose / Vision: Empowering healthcare with AI-driven blood cell classification for faster, accurate, and accessible diagnostics.	
Define CS, fit into	1. CUSTOMER SEGMENT(S) CS Our primary customers are medical professionals, diagnostic labs, and pathology centers who require quick and accurate blood cell classification. Additionally, medical researchers and educational institutions use HematoVision for automated analysis in teaching, diagnosis, and research purposes.	6. CUSTOMER CC Customers such as diagnostic labs or small clinics may face budget limitations, restricting access to expensive diagnostic tools. Limited computing resources and lack of stable internet connectivity in rural or remote areas can also hinder the use of cloud-based or high-compute solutions. Additionally, shortage of trained technicians or inconsistent manual interpretations can impact diagnostic accuracy.	5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none">Manual Microscopic Examination - Performed by trained pathologists or lab technicians using traditional microscopes. It accounts for time-consuming and labor-intensive.Automated Hematology Analyzers - Expensive lab equipment used in advanced hospitals. They offer speed and consistency but are often unavailable and inaccessible in smaller clinics or rural settings.Outsourcing to Diagnostic Labs - Patients' samples are sent to specialized labs. While accurate, it leads to delays in results and increased costs.Basic Mobile Health Apps - Free or low-cost apps for preliminary screening, but lack accuracy and regulatory approval.
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none">Automating Blood Cell Classification: Eliminate manual screen and count time by automating the identification of neutrophils, lymphocytes, monocytes, and eosinophils.Supporting Medical Diagnosis: Assist healthcare professionals in making quicker, more accurate decisions in diagnosing infections or blood disorders.Enabling Access in Resource-Limited Settings: Provide a low-cost diagnostic tool that can run on standard hardware, reducing reliance on high-end lab equipment.Streamlining Interpretation: Reduce variation in results caused by differing levels of human expertise, especially in rural or overburdened clinics.	9. PROBLEM ROOT CAUSE RC The root cause of the problem is the time-consuming and error-prone nature of manual blood cell classification, which requires skilled technicians and advanced laboratory setups. In many regions, especially rural or resource-limited areas, there is a shortage of trained professionals, and the demand for faster diagnosis has increased due to rising patient loads and emerging diseases. This has created an urgent need for automated, reliable, and scalable diagnostic solutions that reduce human dependency and accelerate medical decision-making.	7. BEHAVIOUR BE Customers manually examine blood cells under a microscope, refer to senior experts, or use online resources and training materials to classify cell types. Some engage in additional learning or advocacy to improve diagnostic accuracy and access to better tools.
Focus on J&P, tap into BE, understand	3. TRIGGERS TR Customers are triggered to act when they face diagnostic delays, are concerned with the use of AI tools in labs, read research on automated cell analysis, or discover peers adopting efficient digital diagnostic systems.	10. YOUR SOLUTION SL <ul style="list-style-type: none">Integrate the MobileNetV2 frameworkFit within the customer's limitations (cost, access, AI/IT)Align with their beliefs and motivations	8. CHANNELS OF BEHAVIOUR CH <ul style="list-style-type: none">Search for automated blood cell classification tools on Google or medical forumsConsult senior doctors or pathologists for second opinionsWatch YouTube videos of blood analysis or diagnostic toolsUse medical software platforms or mobile apps for diagnostic assistanceJoin forums or groups (like Reddit, LinkedIn, or ResearchGate) to discuss medical AI
	4. EMOTIONS: BEFORE / AFTER EM Before using the solution, customers often feel uncertain, anxious, or overwhelmed by manual processes and time delays. After adopting the tool, they feel more confident, assured, and in control with faster, accurate, and automated results.		6.2 OFFERLINE Manually examine blood smears using microscopes in pathology labs Consult senior doctors or pathologists for second opinions Attend medical conferences or workshops to learn about new diagnostic tools Consult diagnostic equipment vendors for classes or pricing Explore local medical procurement options for lab supplies
Identify strong TR & EM	<p>Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license. Created by DataVigilance / Amaltama.com</p> <p>AMALTAMA</p>		