

**Project Design Phase**  
**Problem – Solution Fit Template**

Date	17 July 2025
Team ID	LTVIP2025TMID33900
Project Name	<b>HematoVision: Advanced Blood Cell Classification Using Transfer Learning</b>
Maximum Marks	2 Marks

**Problem – Solution Fit Template:**

HematoVision: Advanced Blood Cell Classification Using Transfer Learning" demonstrates a strong problem-solution fit by effectively addressing the challenges of accurate and efficient blood cell classification using deep learning techniques. The project utilizes transfer learning, specifically with pre-trained Convolutional Neural Networks (CNNs) like DenseNet161, to leverage existing knowledge and improve performance on blood cell classification tasks. This approach tackles the limitations of traditional methods, which are often time-consuming and prone to human error, by providing a faster, more accurate, and consistent automated solution.

Here's a breakdown of the problem-solution fit:

Problem:

Manual Blood Cell Analysis is Labor-Intensive:

Traditional microscopic examination of blood smears is a tedious and time-consuming process, requiring skilled technicians and potentially leading to inconsistencies and errors.

Human Error:

Manual analysis is subjective and susceptible to variations in interpretation and fatigue, leading to misclassifications.

Limited Accessibility:

In resource-limited settings, access to skilled hematologists for accurate blood cell analysis can be restricted, hindering timely diagnosis and treatment.

Solution:

Automated Blood Cell Classification:

The HematoVision project leverages deep learning, specifically CNNs, to automate the process of blood cell classification, significantly reducing analysis time and improving efficiency.

Transfer Learning for Enhanced Accuracy:

By employing transfer learning with pre-trained CNNs like DenseNet161, the project benefits from a vast amount of pre-learned features, enabling it to achieve high accuracy even with limited training data.

Improved Consistency and Reliability:

Automated classification offers consistent results across different datasets and reduces the impact of subjective human interpretation, leading to more reliable diagnoses.

Accessibility and Scalability:

The project's automated nature can make blood cell analysis more accessible, particularly in resource-constrained environments, and can be easily scaled to handle large volumes of data.

## Template:

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span> Who is your customer? I.e. working parents of 0-5 y.o. kids	<b>6. CUSTOMER CONSTRAINTS</b> <span>CC</span> What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.	<b>5. AVAILABLE SOLUTIONS</b> <span>AS</span> Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking	Explore AS, differentiate
	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span>J&amp;P</span> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.	<b>9. PROBLEM ROOT CAUSE</b> <span>RC</span> What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.	<b>7. BEHAVIOUR</b> <span>BE</span> What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; Indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	
Identify strong TR & EM	<b>3. TRIGGERS</b> <span>TR</span> What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.	<b>10. YOUR SOLUTION</b> <span>SL</span> If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.	<b>8. CHANNELS of BEHAVIOUR</b> <span>CH</span> <b>8.1 ONLINE</b> What kind of actions do customers take online? Extract online channels from #7	Extract online & offline CH of BE
	<b>4. EMOTIONS: BEFORE / AFTER</b> <span>EM</span> How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure > confident, in control - use it in your communication strategy & design.		<b>8.2 OFFLINE</b> What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.	

## References:

1. <https://www.ideahackers.network/problem-solution-fit-canvas/>
2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>