# Project Design Phase

## Proposed Solution Template

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| Date | 10 June 2025 |
| Team ID | LTVIP2025TMID33677 |
| Project Name | HematoVision |
| Maximum Marks | 2 Marks |

### Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

| **S.No.** | **Parameter** | **Description** |
| --- | --- | --- |
| 1. | **Problem Statement (Problem to be solved)** | Diagnosing blood-related diseases like leukemia often requires manual microscopic analysis by trained professionals, which is time-consuming, error-prone, and not scalable. There is a need for an automated, accurate, and accessible system for classifying blood cells to aid in faster diagnosis. |
| 2. | **Idea / Solution description** | HematoVision is a deep learning-based system that classifies different types of blood cells using transfer learning. It leverages pre-trained models on image datasets to accurately identify cells such as neutrophils, eosinophils, lymphocytes, and monocytes. The model can be integrated into clinical workflows or deployed as a web/mobile app. |
| 3. | **Novelty / Uniqueness** | Unlike traditional ML models, HematoVision uses transfer learning to reduce training time and improve accuracy with limited medical image data. The system also allows integration with microscope camera feeds for real-time analysis and offers explainable AI using techniques like Grad-CAM. |
| 4. | **Social Impact / Customer Satisfaction** | HematoVision can significantly improve early disease detection in remote and under-equipped healthcare settings. It supports pathologists in diagnostics, reducing human error, and accelerating treatment. The accessibility of the tool ensures that underserved communities can benefit from AI-assisted diagnostics. |
| 5. | **Business Model (Revenue Model)** | HematoVision can follow a freemium model: providing basic classification features for free while offering advanced features like real-time microscope integration, cloud storage, and API access on a subscription basis to hospitals, labs, and research institutes. |
| 6. | **Scalability of the Solution** | The model can be scaled to classify more cell types, integrate with other diagnostic tools, and support multiple diseases. It is cloud-deployable and can be easily adapted for both web and mobile platforms. With additional datasets, the system can serve global medical institutions. |