4. Project Design Phase
4.1 Problem – Solution Fit

Date	28 June 2025
Team ID	LTVIP2025TMID35678
Project Name	Pattern Sense: Classifying Fabric Patterns Using Deep Learning
Maximum Marks	4 Marks

Problem – Solution Fit:

The Problem–Solution Fit ensures that the solution designed truly addresses the core needs of the target users. In the case of **Pattern Sense**, the solution was developed to solve two major real-world problems: inefficient manual pattern classification in textile manufacturing, and the lack of searchable pattern-based filters in online clothing platforms. Through deep learning, our system automates pattern recognition, saving time, reducing errors, and improving end-user satisfaction.

Purpose:

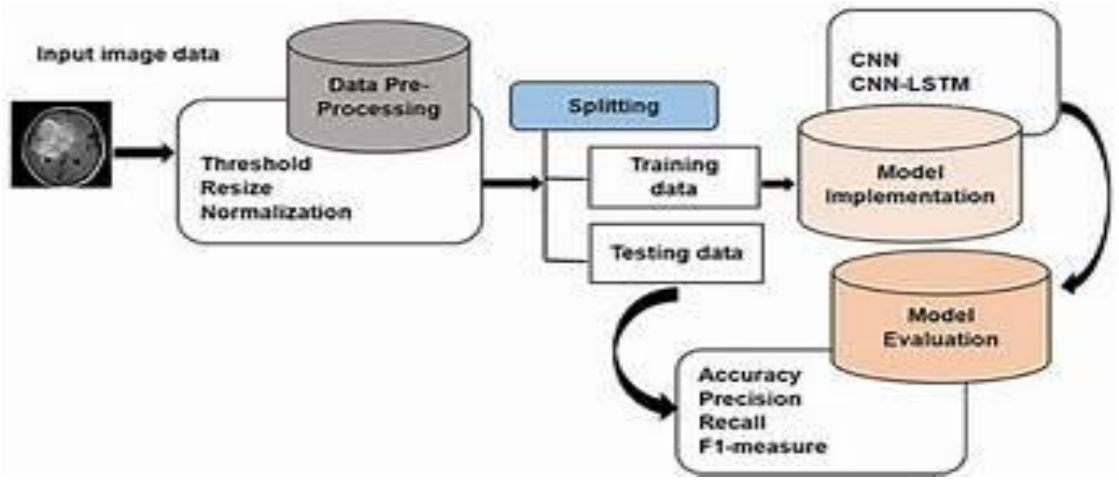
The purpose of the Problem–Solution Fit in the *Pattern Sense* project is to ensure that the solution we designed truly addresses the core pain points and unmet needs of our target users — textile inspectors and e-commerce managers. This phase helps us verify that our AI-driven fabric pattern classifier is not just innovative, but also practical and impactful.

By deeply understanding user behaviors, limitations, and frustrations, we identified a strong match between the problem (manual, slow, and error-prone pattern identification) and our solution (an automated CNN-based classifier integrated with a web app interface).

The fit between the problem and the solution ensures:

- Enhanced productivity and accuracy in textile quality control
- A better user experience for shoppers using pattern-based filtering
- Reduced cognitive load and fatigue for industry professionals
- Increased adoption potential due to solving a real and urgent challenge

Ultimately, this step lays the foundation for building a meaningful, user-centered product that not only works — but works where it matters most.



1. Customer Segment(s)

- Textile quality control professionals
- E-commerce platform managers

2. Customer Constraints

- Manual classification is slow and error-prone
- Lack of structured, labeled pattern data for clothing images

3. Available Solutions

- Manual inspection and spreadsheet-based logging
- Visual similarity search (rare, unreliable)

4. Jobs to Be Done / Problems

- Need to classify fabric patterns quickly and accurately
- Improve customer shopping experience with pattern-based filtering

5. Problem Root Cause

- No automation in pattern detection or tagging
- Lack of deep learning integration into textile workflows

6. Behavior

- Inspectors rely on visual comparison and memory
- Customers browse without specific pattern filters

7. Triggers

- Delays and fatigue during quality checks
- Frustration in online clothing search

8. Your Solution

- CNN-based fabric pattern classifier
- Flask web app for interactive image uploads and predictions

9. Emotions: Before / After

- *Before:* Frustrated, tired, confused
- *After:* Confident, quick, satisfied

10. Channels of Behavior

- Deployed as a web app with an image upload interface
- Possible API integration for e-commerce backends