2. Ideation Phase
2.1 Problem Statement

Date	28 June 2025
Team ID	LTVIP2025TMID35678
Project Name	Pattern Sense: Classifying Fabric Patterns Using Deep Learning
Maximum Marks	2 Marks

Problem Statement:

The problem statement for our project, Pattern Sense, was developed by putting ourselves in the shoes of potential users in the textile and e-commerce industries. This step was essential to understand their frustrations, unmet needs, and the inefficiencies they currently face in identifying and categorizing fabric patterns.

In the textile industry, quality inspectors must manually analyze and tag fabric patterns. This process is not only time-consuming but also prone to human errors due to visual fatigue and subjective judgment. In parallel, e-commerce platforms lack an intelligent system to auto-tag clothing images with fabric pattern types (like striped, polka-dotted, or checked), making it difficult for customers to search or filter products based on pattern preferences.

By framing detailed customer-centric problem statements, we were able to clearly define two major user perspectives: one from a quality inspector in the textile domain, and the other from an e-commerce platform's customer experience team. This understanding helped us ensure our project addresses real pain points and delivers value in the form of automation, speed, and improved accuracy.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A textile quality inspector	Automatically categorize fabric patterns during inspection	Manual checking is time-consuming and inconsistent	Human errors occur due to visual fatigue and subjective judgment	Frustrated and concerned about inefficiency
PS-2	An e-commerce platform dealing with clothing	Enable customers to search products based on pattern type	Images are not labeled with pattern information	There's no system to classify images by fabric pattern	Limited and unsatisfactory user experience

Objective of the Solution:

The primary objective of the Pattern Sense project is to develop an intelligent and automated system capable of accurately classifying fabric patterns using deep learning

techniques. By leveraging a Convolutional Neural Network (CNN), the system aims to identify and categorize patterns such as striped, polka-dotted, checked, and plain from fabric images with high precision.

The solution is designed to eliminate the challenges of manual pattern recognition in the textile industry and improve searchability in e-commerce platforms. By automating the classification process, the project intends to:

- Reduce manual effort and human error in visual inspection tasks.

- Speed up the process of pattern labeling for manufacturers and retailers.

- Enhance customer experience by enabling smarter search and filtering based on fabric patterns.

- Demonstrate the real-world application of computer vision and AI in the fashion and textile domain.

Ultimately, the goal is to build a scalable, user-friendly, and accurate fabric pattern classification tool that can be integrated into existing workflows in both industrial and commercial environments.