

# Capstone Project

## Real-Time Retail Feedback Intelligence

### Context:

ChicStyle — a growing fashion retail platform — experiences massive spikes in customer activity during festive seasons and holiday sales. As people buy clothing and accessories for celebrations, the volume of incoming reviews increases drastically. These reviews pour in every hour, ranging from positive praise to urgent complaints about fit, delivery delays, product defects, or sizing issues.

During such high-pressure periods, even a slight delay in reading or responding to customer feedback can have serious consequences. If the retail team fails to take quick action, customers may feel ignored during an emotionally significant time (festive purchases), leading to frustration, spoiled shopping experiences, and ultimately reduced trust in the brand. This not only results in immediate business loss but also impacts repeat purchases and long-term loyalty.

To avoid customer dissatisfaction and protect brand reputation during peak sales periods, ChicStyle needs a system that can process thousands of reviews instantly, accurately, and with business context.

### Problem Statement:

Retailers need a smart feedback analysis system that can automatically process large volumes of real-time customer reviews, accurately detect sentiment (positive, negative, neutral), identify which product or service the feedback is about, and highlight urgent or high-impact issues.

Traditional NLP models often struggle with this because they depend on fixed rules and limited training data. They can't easily understand complex or mixed feedback. For example, in the review "The fit is great but the color was not as per the product image," older systems may give only one sentiment, either positive or negative, missing that the review talks positively about the fit but negatively about the color.

Generative AI models are much better at this. They can understand the full meaning of a sentence, separate opinions about different products, and catch mixed emotions. This helps retailers get more accurate insights and respond to customer problems faster.

## Objective:

Build a Generative AI feedback system that uses prompt engineering (Zero-Shot, Few-Shot, and Chain-of-Thought prompting) to:

- Analyze and categorize sentiment in real time.
- Detect which product or service each feedback refers to.
- Summarize insights by product category and urgency level.
- Automatically send short, personalized messages to customers based on sentiment—thanking them for positive feedback, acknowledging neutral comments, and apologizing for negative ones while informing them that a team member will reach out soon.
- Generate short, actionable reports for retail teams.

This intelligent system will help retailers take quick action on customer issues, improve product quality faster, and enhance customer satisfaction — turning massive unstructured feedback into meaningful, real-time business intelligence.

## Data Dictionary:

This analysis uses the "**Women's E-Commerce Clothing Reviews**" dataset. The key columns for the analysis are:

- **Clothing.ID:** A unique ID for each piece of clothing.
- **Age:** The age of the reviewer (Positive Integer).
- **Title:** The title of the review (String).
- **Review.Text:** The main body of the customer's review text (String).
- **Rating:** The product score given by the customer, from 1 (Worst) to 5 (Best) (Positive Ordinal Integer).
- **Recommended.IND:** A binary variable indicating if the customer recommends the product (1 for recommended, 0 for not recommended).
- **Positive.Feedback.Count:** The number of other customers who found the review helpful (Positive Integer).
- **Division.Name:** The high-level division of the product (Categorical).
- **Department.Name:** The specific department of the product (Categorical).