# Analyzing and Identifying Attributes of Apparel Products and their Effect on Sales

## A Proposal report for the BDM capstone Project

Submitted by

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# Declaration Statement

I am working on a Project titled "Analyzing and Identifying Attributes of Apparel Products and their effect on Sales.". I extend my appreciation to V - Mart Retails, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

*Tanmay*

Signature of Candidate: (Digital Signature)
Name: Tanmay Garg
Date:  3rd September, 2024

# 1 Executive Summary and Title

Founded in 2002 by Vijay Sethi and Mohan Singh, V Mart is a leading retail chain in India, specializing in affordable apparel and home products. With a net worth of over $300 million, it operates more than 200 stores across 20+ states, employing around 5,000 people. The company's mission is to provide quality products at competitive prices, while its vision focuses on expanding its footprint and enhancing customer experience.

In the retail industry, apparel products are categorized into various types such as Jeans, Shirts, T-Shirts, and Pyjamas. Each product category has several attributes that may influence its sales performance. These attributes include, but are not limited to, Color, Fabric, Pattern, Brand, and Wash.

Task is to analyze how each attribute affects the sales of different apparel categories. Specifically, you need to identify which attributes are most important for driving sales within each category. For instance, you might find that Color and Fabric are significant for Jeans, whereas Brand, Pattern, Fabric, and Wash are crucial for Shirts.

To solve this problem we will have to start from collecting data on different SKU's. At present any SKU at V - Mart has 14 attributes. Use statistical techniques to analyze the impact of each attribute on sales for each category, with proper rationale why this statistical method was chosen. Identify which attributes are most influential for sales in each apparel. Provide insights into how these attributes affect sales and discuss any patterns.

The anticipated results are expected to provide valuable, actionable insights that not only enhance the understanding of sales patterns but also contribute to driving higher sales performance and boosting overall revenue growth.

# 2 Organization Background

I am employed with V Mart Retail, an Indian value retail chain that offers stylish garments, accessories, footwear, and miscellaneous merchandise at affordable costs. Lalit Agarwal founded V Mart in 2002 with the goal of providing middle-class and lower-middle-class households in Tier II and Tier III cities with high-quality products at reasonable prices. The business has grown significantly, and it now employs over 8,000 people and has over 400 stores in several Indian states.

V Mart sells apparel for men, women, and kids in a wide range of sizes in addition to a sizable assortment of household goods and other items. The company's goal is to close the gap between high fashion and affordability for customers in semi-urban and rural areas. V Mart's mission is to enhance customer satisfaction through efficient retail services, while its vision is to become the most preferred retail brand in India. It is one of the fastest growing retail chains in India.

# 3 Problem Statement (Listed as objectives)

3.1 Problem statement 1: The purpose of this research is to identify the key elements—such as brand, color, and fabric—that significantly impact the sales of several categories of apparel. It aims to close this disparity and help retailers hone their strategies for higher customer satisfaction and better sales results.

3.2 Problem statement 2:

# 4 Background of the Problem

Conducting market research before deep diving into the nuances of the problem is necessary. Following are the major cause of problems

Internal Problems:

Inventory Management Inefficiencies: For any retail brand it is important to manage its inventory to the best. If stockout occurs for a particular SKU, it drives customers to other platforms, which can lead to customer churn, this increases cost for retaining a customer.

Limited Focus on Customer Service: V-Mart should enhance customer service by simplifying returns and tracking orders, as ineffective experiences like long wait times and unhelpful staff can lead to negative reviews and decreased sales.

External Problems:

Increasing Competition: There are many big companies fighting for market share in the very competitive Indian retail sector. While MNCs like Amazon have competitive advantage of surplus inventory and capital, companies like The Soul Store are able to create products for a very specific market. This creates a competitive market space for V-Mart.

Changing Consumer Preferences: Providing customers  specific products is necessary in today's market. Customers are increasingly seeking unique styles, high-quality fabrics, and sustainable products. To meet the shifting demand and draw in new clients, V-Mart must keep up with these shifting preferences.

# 5 Problem Solving Approach

To solve the business problem with a data centric approach, identifying and collecting the right data is important in context to our problem will require data containing attributes such as material, color, style, size and many more. After that we need to clean the data to ensure data accuracy and reliability for analysis. Further we can now apply multiple statistical techniques. Some which are mentioned below.

**1. Statistical Analysis:**

Some of the common statistical techniques that can be used for our case:

- Correlation matrix and Pareto charts can be used for identifying the relationships between different attributes and sales. This will help us highlight those with the strongest influence.
- Regression models can be used to analyze to understand the effect of different attributes on sales over time by using linear and multiple linear plots.
- As single SKU can have attributes like maximum, here tools like ANOVA to compare the means of sales for different levels of categorical attributes as mentioned above. This will help identify attributes that significantly impact sales variations.
- Gap Analysis can be used to understand what is the current status of sales and factors such as customer return rate and what are the expectations for sales and such factors. Then focusing on factors that lag the most and seem to affect the sales
- A SWOT analysis can be conducted to understand strengths, weakness, opportunity and threats to improve their advertising. Knowing their strengths they can present them as their unique proposition that sets them apart from their competition. Knowing their opportunities and threats they can better time and focus on their market.

**2. Machine Learning Approach:**

Some of the common machine learning techniques that can be used for our case:

- To understand how a customer makes a decision for buying a particular SKU based on multiple attributes decision trees and random forests algorithms can identify the most important features for predicting a target variable (sales).
- Finding attributes that when combined together to drive up sales can be achieved using gradient boosting models, such as XGBoost and LightGB.. This will provide a deeper understanding of the attributes, which can help in prioritizing SKU presenting such attributes.

To effectively and concisely communicate the main conclusions of our investigation, we will employ suitable data visualization techniques, such as bar charts, scatter plots, and heatmaps. Lastly, we will offer actionable recommendations to V-Mart to boost sales performance.

# 6 Expected Timeline
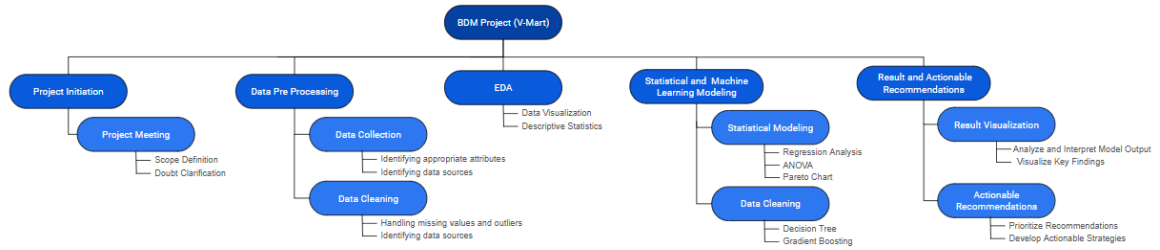
## 6.1 Work Breakdown Structure



*Figure 1 Work Breakdown Structure for completion of project.*
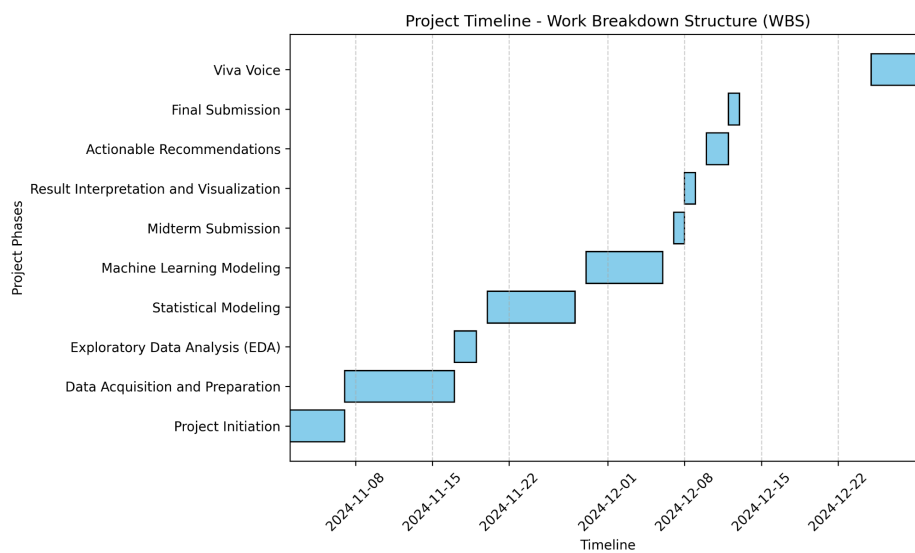
## 6.2 Gantt chart



*Figure 2 Expected timeline for completion of project.*

# 7 Expected Outcome

7.1 Improved Understanding of Key Sales Drivers: Identifying attributes such as color, fabric, brand, and wash, have the most significant impact on sales for each SKU.

7.2 Improved Customer Understanding: The analysis will reveal how different attributes impact customer preferences and purchasing behavior. This understanding can help V-Mart personalize marketing messages, tailor product offerings to specific customer segments, and improve overall customer satisfaction.