

Project Summary: Discount Analysis on Flipkart Fashion Products

Saturday, 31 May 2025

Objective

To analyze the effectiveness of discounting strategies across Flipkart's fashion product categories, identify potential revenue leakage, and recommend optimal discount levels that balance customer satisfaction and profitability.

Methodology

1. Data Preparation

- Parsed and cleaned fashion product dataset (flipkart_fashion_products_dataset.json)
- Created new features:
 - $\text{discount} = \text{actual_price} - \text{selling_price}$
 - $\text{discount_in_percentage} = (\text{discount} / \text{actual_price}) * 100$

2. Analytical Techniques Used

- **Exploratory Data Analysis (EDA)** on discount, price, and rating trends
 - **Chi-Square Test** to evaluate association between category and discount range
 - **Linear Regression** to assess correlation between discount % and product rating
 - **KMeans Clustering** to group products by discounting and rating behavior
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Key Metrics & Insights

- **Average Discount %:** Varied significantly across categories; often exceeded 50%
- **Optimal Discount Range:** 40%–45% gives the best balance between competitiveness and revenue preservation
- **Estimated Revenue Leakage:** ~₹2 Crores due to excessive and ineffective discounting
- **Discount vs Rating Correlation:** Weak — higher discounts did not correlate with higher ratings

- **Chi-Square Test p-value:** < 0.05 — significant association between category and discount level
 - **Loss-Making Segments Identified:** Categories with high discounts but poor ratings (e.g., < 3.5 average rating)
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Findings

- Discounts above **45%** do not significantly improve customer satisfaction and lead to **margin loss**
 - Discounts below **40%** may not attract enough customer attention in competitive segments
 - The **sweet spot is 40%–45%**, which balances attractiveness and profitability
 - Several high-rated products are still over-discounted, indicating **missed profit opportunities**
 - Some categories showed consistent discounting without improvement in average ratings
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Recommendations

1. **Limit Discounts to $\leq 45\%$**
 - Avoid deep discounting that does not drive meaningful customer value
 2. **Set Minimum Discount of 40% Where Competitive**
 - Ensure promotions remain appealing in price-sensitive categories
 3. **Reduce Discounts on Low-Rated Products**
 - Divert marketing budget toward quality or service improvements
 4. **Use KMeans Clusters for Targeted Pricing**
 - Tailor discounts based on product performance, customer sentiment, and price range
 5. **Run A/B Tests to Validate Discount Ranges**
 - Experiment with different discount brackets to confirm the 40–45% window
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Business Impact

- Identified **~₹2 Crores in potential revenue loss**
- Defined **actionable discount thresholds (40%–45%)**

- Provided **category-level insights** for smarter promotional strategies
- Supported data-driven decisions through statistical testing and machine learning