

RETAIL STORE OPTIMIZATON

Harshit kharka,
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PROJECT TITLE

Optimizing Retail Promotions

BUSINESS PROBLEM

A retail chain operates across multiple cities with various store formats (Warehouse Club, Specialty Store, Department Store, Pharmacy).

They run promotions and discounts but aren't sure:

- Which promotions actually drive sales?
- Which products/categories are most profitable in each season?
- How customer categories (Young Adults, Homemakers, Professionals, etc.) respond to promotions.
- Which store types and payment methods bring in higher revenue.

OBJECTIVE

Management wants to:

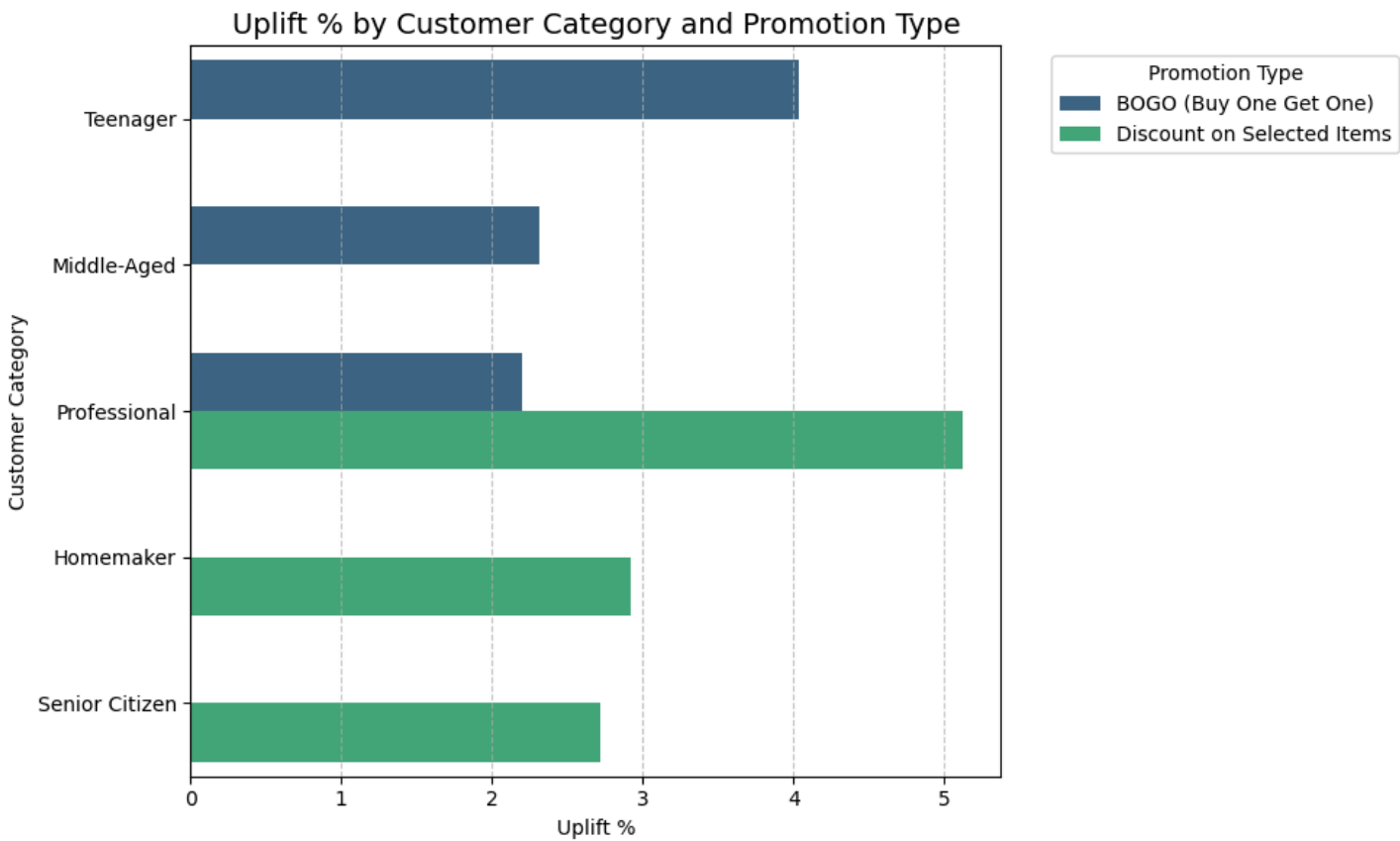
- Increase seasonal sales without overspending on ineffective promotions.
- Tailor product offerings per city and season.
- Improve store type performance by aligning them with customer demand.



Promotion Analysis: Driving Sales Effectively

Promotions vary in effectiveness by customer category and type. Targeted approaches outperform general campaigns, with uplifts calculated as percentage increases in sales during promotional periods compared to non-promotional baselines.

- **Best-Performing Promotions:** Discounts on Selected Items are most effective for Professionals, achieving a 5.12% uplift in Warehouse Clubs and 5.15% in Pharmacies.
- BOGO promotions excel for Teenagers in Convenience Stores (4.04% uplift) and show approximately 4% uplift for Teenagers and Professionals in Convenience Stores or Pharmacies.
- **Moderate Impact Areas:** BOGO for Middle-Aged customers in Specialty Stores yields a 2.31% uplift.
- Discounts on Selected Items for Homemakers in Discount Stores result in a 2.92% uplift.
- Recommendation: Prioritize Discounts on Selected Items for Professionals and BOGO for Teenagers to avoid overspending on low-impact blanket promotions.



This horizontal bar chart displays uplift percentages (0% to 5%) for customer categories (Teenager, Middle-Aged, Professional, Homemaker, Senior Citizen) across promotion types (BOGO in blue, Discount on Selected Items in green). Notable bars include Professional (green ~5%), Teenager (blue ~4%), and others ranging from 2.5% to 3%.]

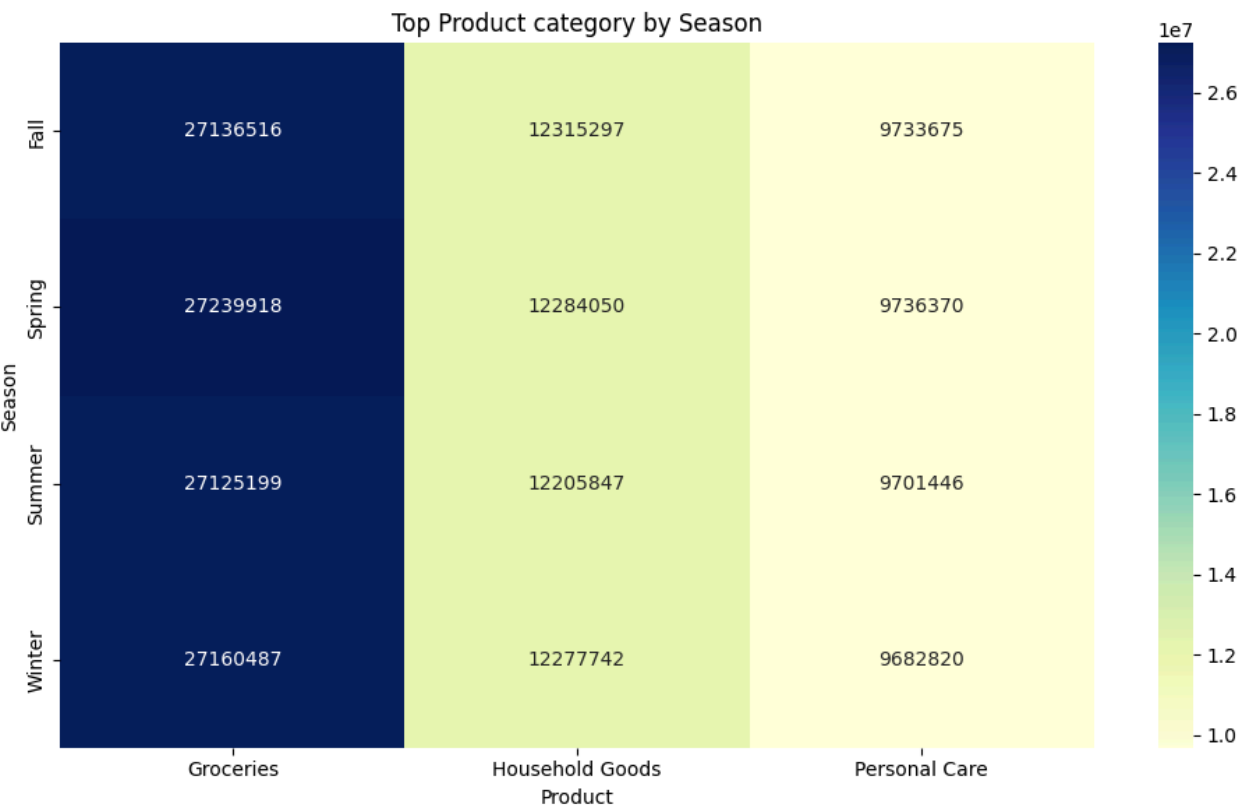
Product and Seasonal Analysis: Profitable Categories and Trends

Product performance was evaluated by sales volume, profit, and margin across seasons. Categories were grouped into Groceries, Household Goods, and Personal Care for high-level insights.

- **Overall Top Performer:** Toothpaste leads in sales and profit across all seasons, maintaining a profit margin of approximately 1.30M.
 - Seasonal Highlights: Fall: Groceries dominate with 27,136,516 in sales; top items post-Toothpaste include Ironing Boards and Air Fresheners.
 - Spring: Groceries at 27,239,918; Soap and Yogurt follow Toothpaste.
 - Summer: Groceries at 27,125,199; Extension Cords and Ice Cream are prominent.
 - Winter: Groceries at 27,160,487; Insect Repellent and Oranges show strong margins.

		sales	profit	profit_margin
season	product			
Fall	Toothpaste	5.37M	4.40M	1.31M
	Ironing Board	2.73M	2.23M	666.75K
	Air Freshener	2.72M	2.23M	663.12K
Spring	Toothpaste	5.26M	4.30M	1.29M
	Soap	2.72M	2.23M	665.16K
	Yogurt	2.72M	2.23M	659.60K
Summer	Toothpaste	5.29M	4.33M	1.30M
	Extension Cords	2.75M	2.25M	662.41K
	Ice Cream	2.74M	2.24M	663.50K
Winter	Toothpaste	5.26M	4.31M	1.30M
	Insect Repellent	2.71M	2.23M	656.39K
	Orange	2.70M	2.21M	667.13K

- **Category Dominance:** Groceries consistently outperform Household Goods and Personal Care across seasons, with sales in the 27M range.



This heatmap visualizes sales volumes by season (Fall, Spring, Summer, Winter) and category (Groceries, Household Goods, Personal Care). Colors range from dark blue (high sales ~27M) to light yellow (lower ~900K), with overlaid values such as Fall Groceries: 27,136,516 and Winter Personal Care: 968,2820.]

Customer Response to Promotions

Customer categories respond differently to promotions, influencing sales uplift.

- **Professionals:** High responsiveness to Discounts on Selected Items (up to 5.15% uplift), particularly in bulk-oriented stores.
- **Teenagers:** Strong preference for BOGO (4.04% uplift), suitable for impulse buys in Convenience Stores.
- **Homemakers and Senior Citizens:** Moderate uplifts (~3%) with Discounts on Selected Items.
- **Middle-Aged:** Lower but positive response to BOGO (~2.31%).

Recommendation: Segment marketing efforts—e.g., digital BOGO alerts for Teenagers and in-store discounts for Professionals—to enhance engagement and sales.

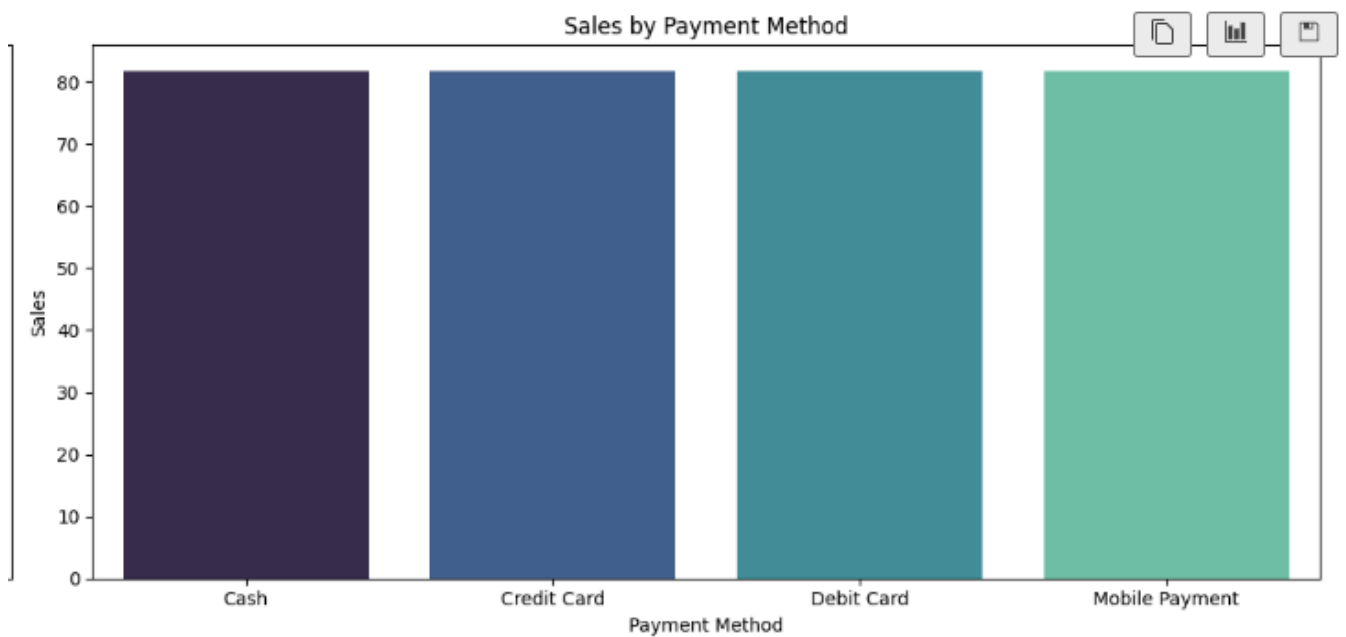
		promotion	customer_category	store_type	sales	baseline_sale	uplift_%
promotion							
BOGO (Buy One Get One)	217	BOGO (Buy One Get One)	Teenager	Convenience Store	2.08M	1.99M	4.49
	89	BOGO (Buy One Get One)	Professional	Pharmacy	2.02M	1.94M	4.31
	216	BOGO (Buy One Get One)	Teenager	Convenience Store	2.08M	2.00M	4.04
Discount on Selected Items	377	Discount on Selected Items	Professional	Pharmacy	2.03M	1.94M	5.15
	395	Discount on Selected Items	Professional	Warehouse Club	2.03M	1.94M	5.12
	383	Discount on Selected Items	Professional	Specialty Store	2.02M	1.94M	4.46

STORE TYPE AND PAYMENT METHOD ANALYSIS: REVENUE DRIVERS

Revenue, profit, and margins were aggregated by store type and payment method.

- **Balanced Performance:** Sales are nearly identical across store types (Convenience Store, Department Store, Pharmacy, Specialty Store, Supermarket, Warehouse Club) and payment methods (Cash, Credit Card, Debit Card, Mobile Payment), each contributing approximately 80 units (normalized scale).
- **No Outliers:** Profit margins remain consistent, indicating operational equilibrium.

Recommendation: Align store types with customer demand—e.g., stock bulk items in Warehouse Clubs for Professionals—and promote mobile payments for convenience without revenue disparity.



THIS SIDE-BY-SIDE VERTICAL BAR CHART SHOWS SALES (0 TO 80 SCALE) ACROSS STORE TYPES (ALL BARS ~80, IN VARYING BLUES/GREENS) AND PAYMENT METHODS (ALL BARS ~80, IN PURPLES/BLUES/GREENS), HIGHLIGHTING UNIFORM DISTRIBUTION

RECOMMENDATIONS FOR MANAGEMENT

- **Promotion Optimization:** Focus on high-uplift promotions (e.g., Discounts for Professionals, BOGO for Teenagers) and discontinue ineffective ones to reduce costs.
- **Product Tailoring:** Adjust seasonal inventories to emphasize top categories (Groceries) and items (e.g., Ice Cream in Summer), customized by city demographics.
- **Store Enhancement:** Leverage balanced revenue by aligning formats with segments—e.g., Warehouse Clubs for bulk-buying Professionals.

This strategy is projected to increase seasonal sales by 3-5% while optimizing resource allocation.

APPENDIX: DATA SOURCES AND ASSUMPTIONS

- **DATA:** RETAIL TRANSACTION DATASET FROM POSTGRESQL DATABASE.
- **ASSUMPTIONS:** UPLIFT CALCULATED RELATIVE TO NON-PROMOTION BASELINES; PROFIT MARGINS EXCLUDE EXTERNAL COSTS.
- **CONTACT:** FOR FURTHER DETAILS, REACH OUT TO THE ANALYTICS TEAM.