Customer Segmentation for Strategic Insights

Uncovering Key Store Patterns with Data-Driven Analysis

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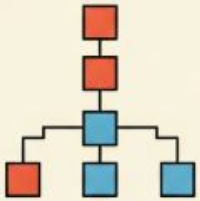
What if you could predict which stores outperform the rest?

Importance of Segmentation

This project reveals how customer segmentation drives business growth.

Data Sources



Product Hierarchy

Product Names

Sales

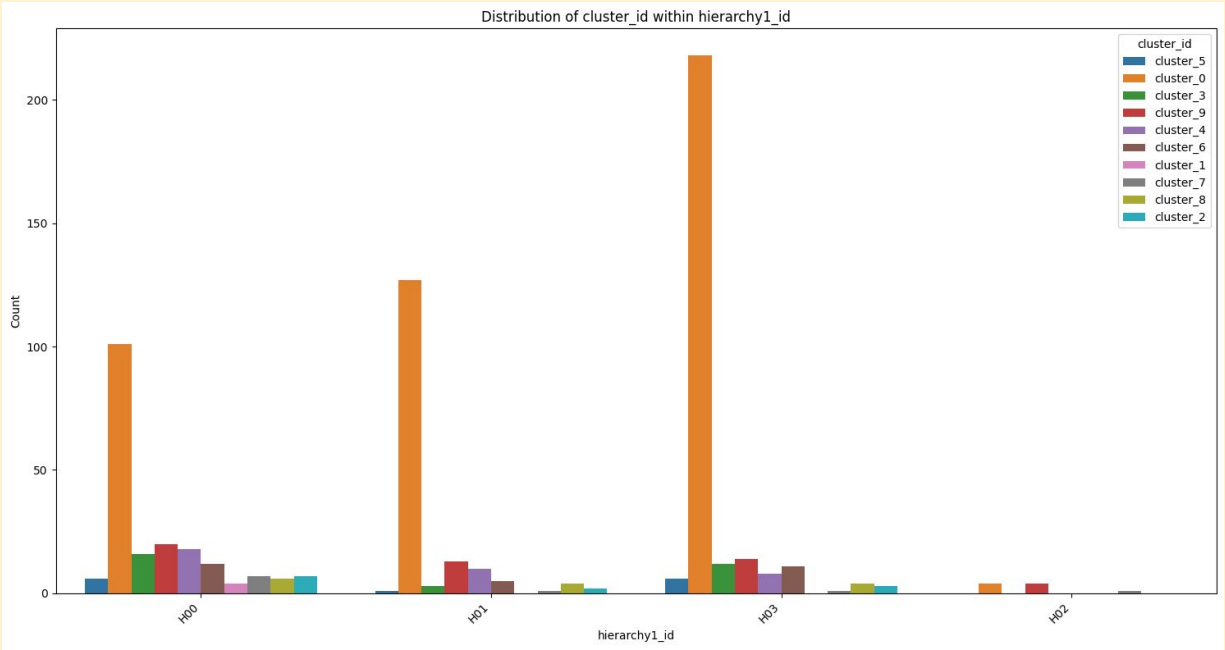
Store Cities

Store Names

Data Sources

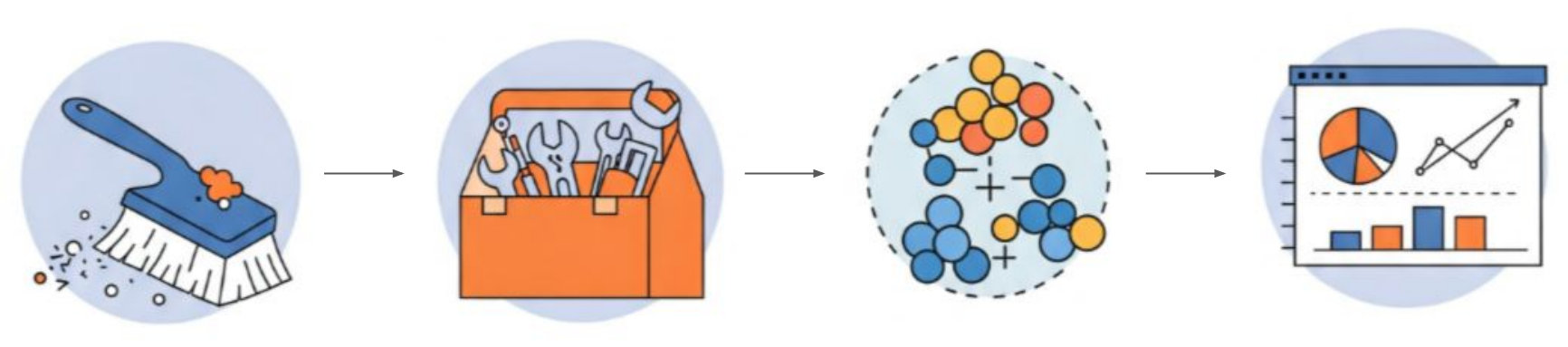
Column	Description
sales	Sales quality
revenue	Daily total sales revenue
product_id	UI of a product
store_id	UI of a store
price	Product sales price
unique products	
stock	EOD stock quantity

Data Sources



Chi-Square test indicated that predicted values cannot be substituted based on other hierarchy fields.

Experimental Design and Roadmap



Data Cleaning

Feature Engineering

Clustering Analysis

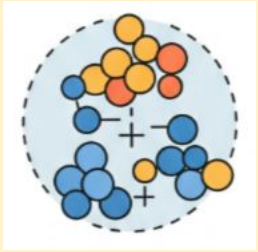
Cluster Evaluation

Data Cleaning

- Missing values removed
- Standardized date and text
- Cleaned for numerical consistency

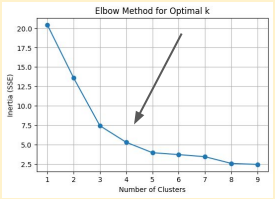
Feature Engineering

- Unique products
- City name reference
- Feature scaling
- Dask to pandas
- Apriori vs FP-Growth algorithm
- Elasticity df, forecast demand and stock model training
- Stock and customer segmentation
  - Average transaction value
  - Sales per product
  - MinMaxScaler vs StandardScaler

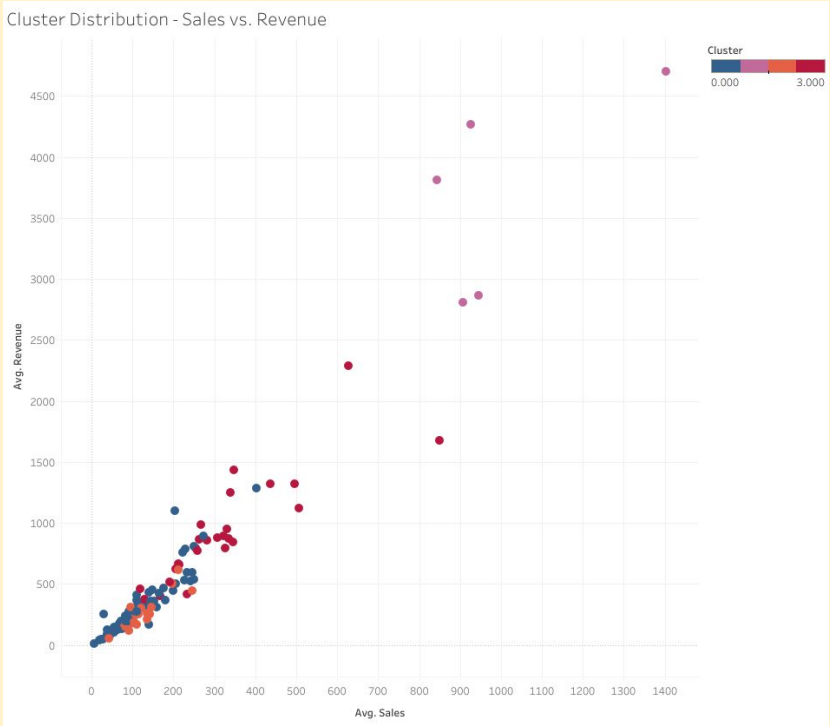


Cluster Analysis and Evaluation

Cluster 0: Low sales/revenue with limited product variety
Cluster 1: High-performing stores
Cluster 2: Niche or specialized stores
Cluster 3: Balanced performance stores



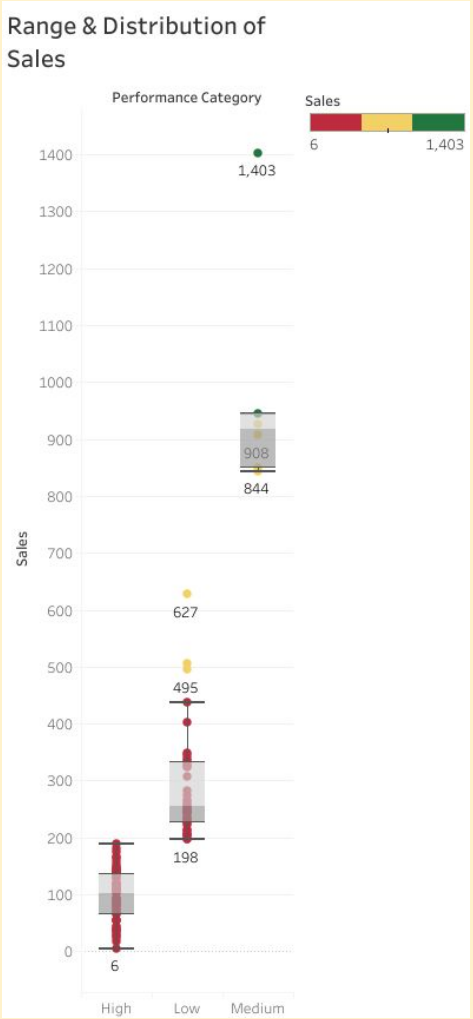
1. Defined df with sales, revenue and product_id: “nunique”.
2. Elbow method cluster count: 4
3. K-means clustering



Store Segmentation

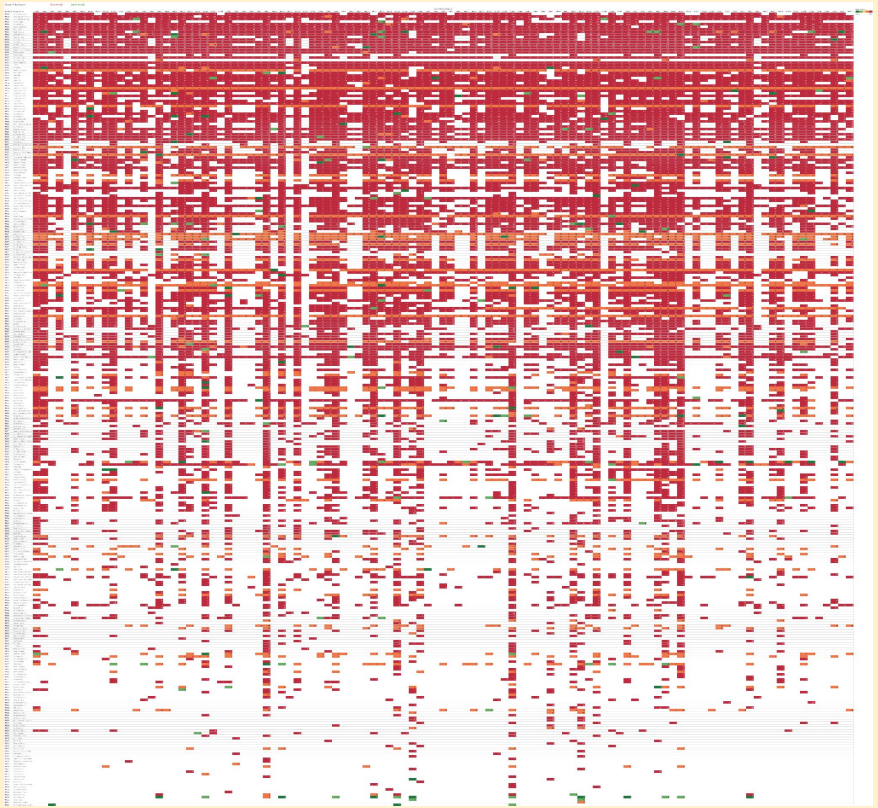
- **High performing** stores may need **more stock** while low performers **require sales strategies**.
- **Low performing** stores can be targeted for **promotions** to **boost performance**.

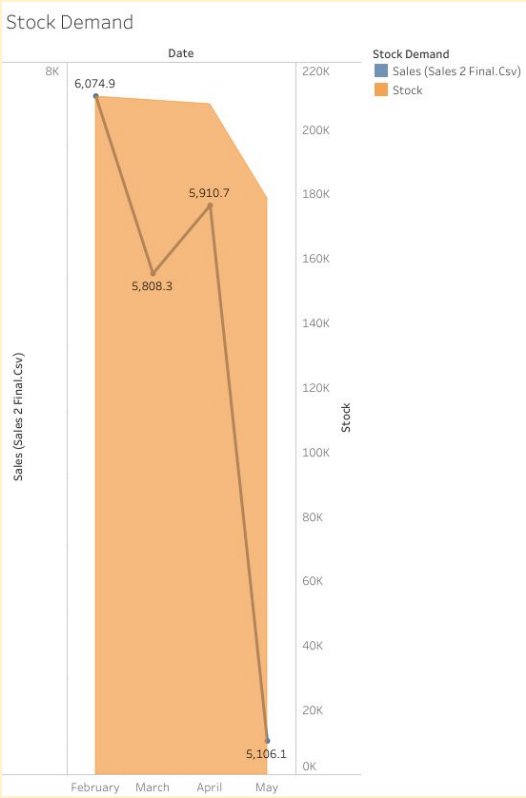
Expansion Strategy:
Understand what makes **medium-performance** stores successful for **future store planning**.



Stock Optimization

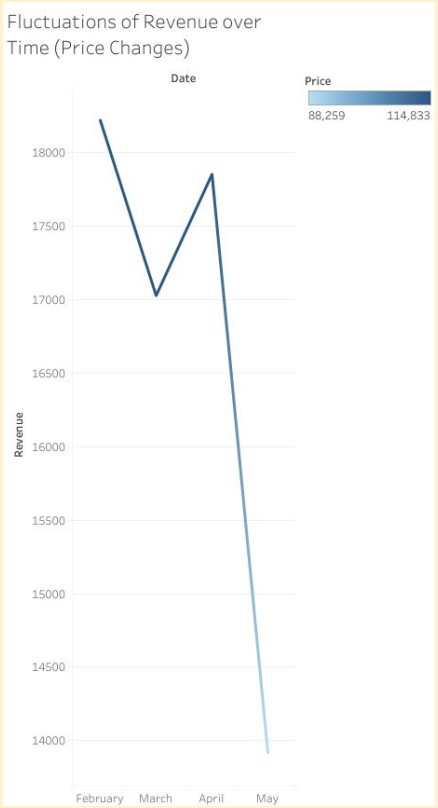
Low Stock
OK Stock
Overflow

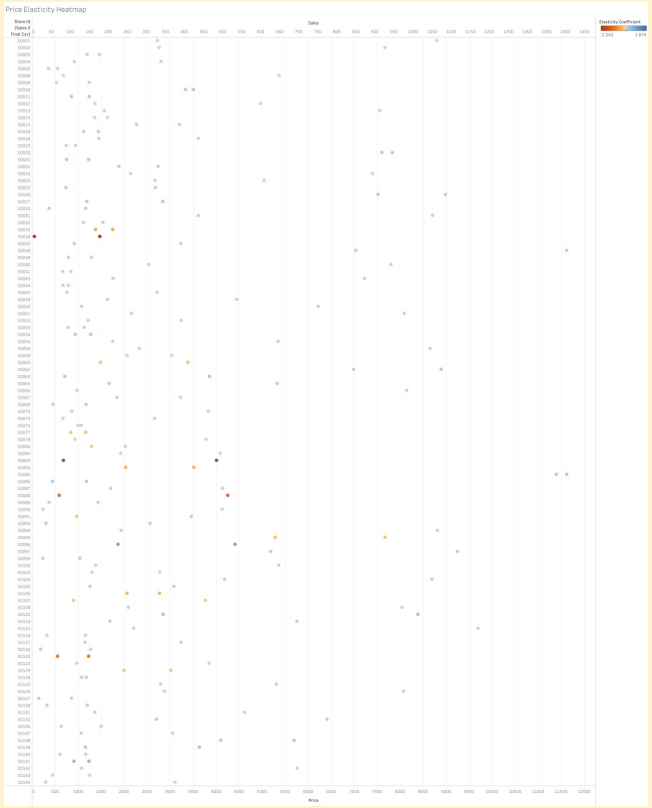




Price Elasticity & Revenue Optimization

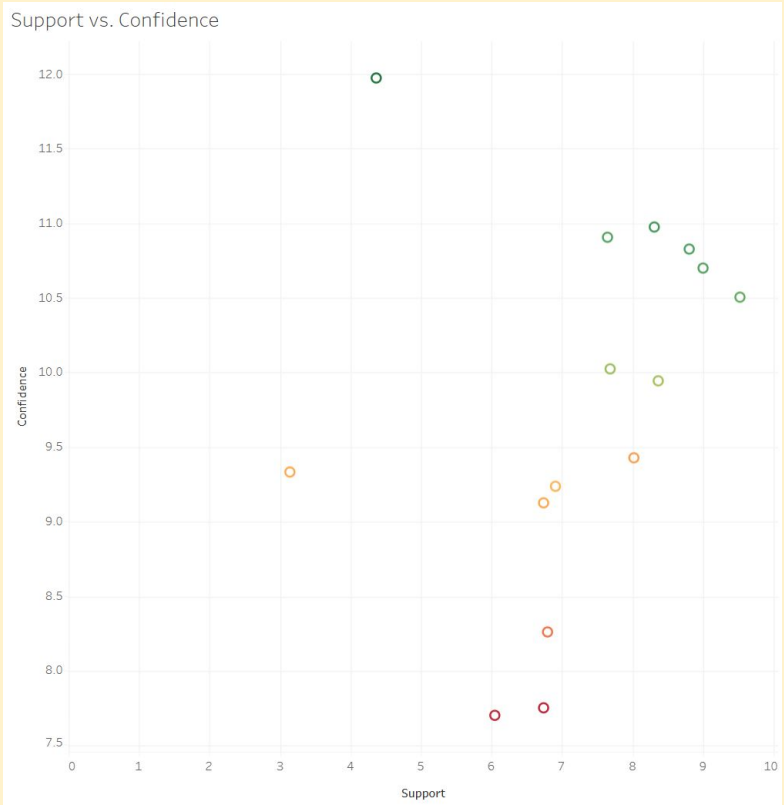
- Revenue spikes align with price drops.
- Higher prices lead to lower sales indicating elastic demand.





Market Basket Analysis

- **Nano Grill Flow** should be used for aisle planning and co-marketing strategies.
- **Smart speakers** with voice assistant are highly dependable during promotions.
- **Solar Grill Pulse and Nano Grill Flow** are highly reliable in pairings.



Recommendations

Cluster 0: Focus on cross-selling strategies or bundling promotions to improve revenue.

Cluster 1: Maintain current strategies and explore premium product expansions.

Cluster 2: Introduce targeted marketing campaigns to maximize returns on niche products.

Cluster 3: Experiment with localized promotions or seasonal strategies to boost performance.

Recommendations

- Promote or discount highly elastic products.
- Increase price of inelastic products.
- Profit-maximize by using *price points guide* provided
- Overstock reduction strategy. Stockouts coincide with lower sales performance.
- Prioritize high-demand stores for replenishments: use *stock replenishment schedule* provided.

Next Steps...

- Develop targeted store-level strategies to improve low-performing locations.
- Incorporate **real-time** stock monitoring.
- Develop automated stock replenishment models.
- Product bundle recommendation analysis
- **Cross-product elasticity** analysis
- Develop automated price reco models
- **Geological** cluster analysis
- DBSCAN or hierarchical clustering for improved segmentation

Thoughts? Questions?

Thank you!