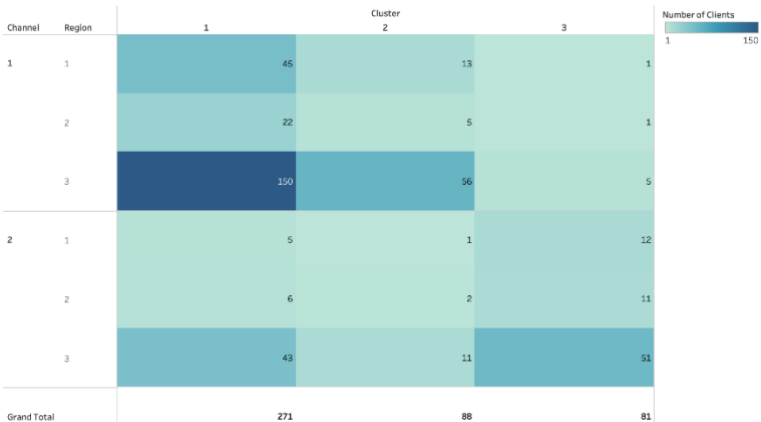# Executive Summary

XYZ Wholesale aims to better understand customer behavior, optimize inventory management, and improve client satisfaction. This analysis provides actionable insights into purchasing patterns, enabling XYZ to implement data-driven marketing, align its offerings with client needs, increase sales, and enhance overall operational efficiency. By adopting a data-centric approach, XYZ can create a more agile, responsive supply chain, driving both growth and customer loyalty.

To investigate the Wholesale Customer Datasets, we decided to run the following techniques:

- **Clustering:** We categorized clients into three distinct clusters based on their spending patterns using two clustering techniques: Hierarchical Clustering and K-Means. The hierarchical dendrogram suggested 3 to 4 potential clusters. After evaluating both k=3 and k=4 cluster sizes and comparing average silhouette widths, we found that K-Means clustering performed best with 3 clusters.

- **Correlation:** For correlation analysis, we calculated the correlation between each type of product being purchased by the clients across all channels and regions. Correlation will help us understand what products a client is most likely to purchase together.
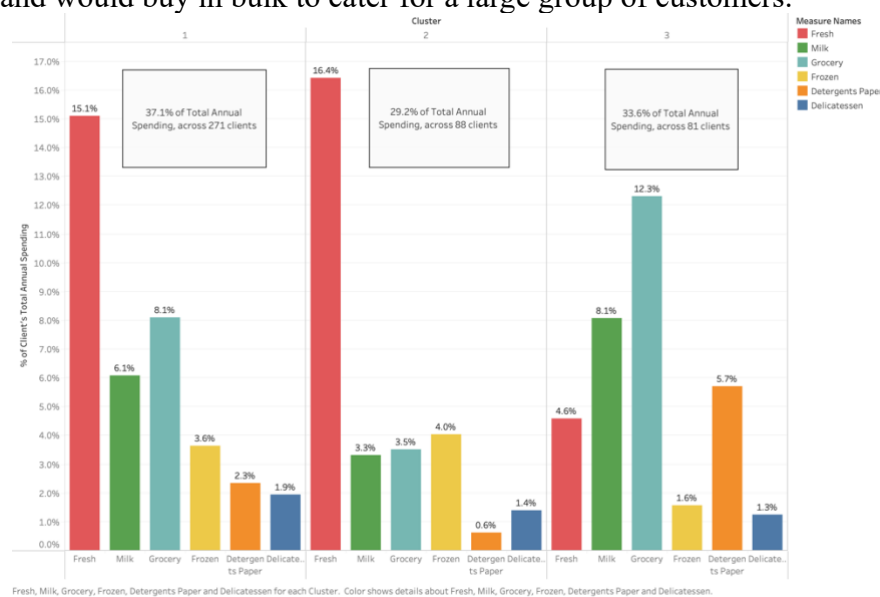
Key Insights

1. Based on the clustering results, most of the clients **(34.1%)** are in Cluster 1, which represents the highest spending group, accounting for 37% of total annual spending. These **150** clients are from the **"Horeca"** channel and belong to the **"Other Regions"** category.

| Channel	Region	Cluster 1	Cluster 2	Cluster 3
1	1	45	13	1
	2	22	5	1
	3	150	56	5
2	1	5	1	12
	2	6	2	11
	3	43	11	51
Grand Total		271	88	81

Executive Summary

❖ **Cluster 1:** This is the largest cluster by client count (271 clients). While they spend across all product categories, each client has a lower purchase volume, with the cluster contributing only 37% of total annual spending. The majority are in the Horeca channel, possibly representing small café or restaurants. In the retail sector, this cluster could include individual customers or smaller shops that require frequent frequency but less inventory of products.

❖ **Cluster 2:** This cluster has the highest spending on Fresh products (16.4% of total annual spending) and Frozen products (4% of total annual spending), with most clients coming from the Horeca channel. Hotels and restaurants can be included in the customer portfolio for this group which uses large refrigerators to store food and supplies.

❖ **Cluster 3:** This cluster consists almost entirely of retail clients (91.4%), such as supermarkets or convenience stores selling groceries, milk and Detergent paper. Such clients might require frequent stock refills and would buy in bulk to cater for a large group of customers.

Fresh, Milk, Grocery, Frozen, Detergents Paper and Delicatessen for each Cluster. Color shows details about Fresh, Milk, Grocery, Frozen, Detergents Paper and Delicatessen.

2. Detergent Paper is highly correlated with the Grocery. This shows that clients are likely to buy detergent paper when they go out for grocery shopping. Both products come under the daily needs of customers.
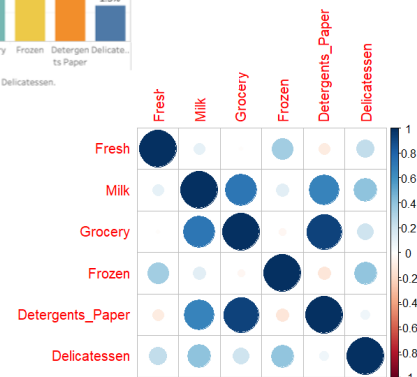
Executive Summary

<u>**Recommendations:**</u>

1. **Increase purchase frequency for low-volume group:** To enhance sales, XYZ can encourage more frequent purchases. For the Horeca, consider offering smaller product options or subscription plans. For retail, implementing a customer loyalty program would incentivize repeat purchases.

2. **Bulk Purchasing Deals for large-volume group & retail clients:** XYZ can offer special bulk-buying deals or discounts, encouraging larger purchases. Additionally, introducing subscription models will ensure clients receive a consistent supply while providing XYZ with predictable revenue.

3. **Long-Term Contracts:** Long-term supply contracts to these Horeca clients for fresh and frozen goods. This would help secure loyal clients and steady revenue streams.

4. **Targeted Promotions:** Use personalized marketing strategies such as email campaigns or loyalty programs to target clients specifically.

5. **Customized Product Mix**: Since clients in cluster 1 have distributed spending across multiple product categories, we can offer flexible, customizable product bundles that fit the needs of small hotels, restaurants, and retail shops.

6. **Cross-Promotion and Bundling for Grocery and Detergents Paper:** Leveraging the correlation between Grocery and Detergents Paper, XYZ should consider creating sales strategies on these two categories.

7. **Invest in Cold Chain Logistics:** To meet the demands of Horeca clients purchasing significant amounts of fresh and frozen goods, investing in improved cold chain logistics is essential. Enhancements in refrigerated transportation and storage based on regional clustering analysis will ensure product freshness and quality.