



# Customer Segmentation via Clustering Analysis Report

## Introduction

We conducted customer segmentation using clustering techniques on an e-Commerce dataset to identify distinct customer groups based on their profile and transaction behaviors. The dataset included customer data from Customers.csv and transaction data from Transactions.csv.

## Cluster Characteristics:

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### High-Value, Frequent Shoppers

- Very high total spend, contributing a large portion of revenue
- Above-average order values, suggesting they purchase more expensive or bulk items
- High frequency of purchases, indicating loyalty and regular engagement
- A mix of long-term and newer customers quickly integrating with the platform.

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### New or Less Engaged Customers

- Lower total spend, likely new or disengaged
- Potentially purchase less expensive items
- Infrequent purchases or recently signed up
- Could benefit from introductory offers, education, or reactivation

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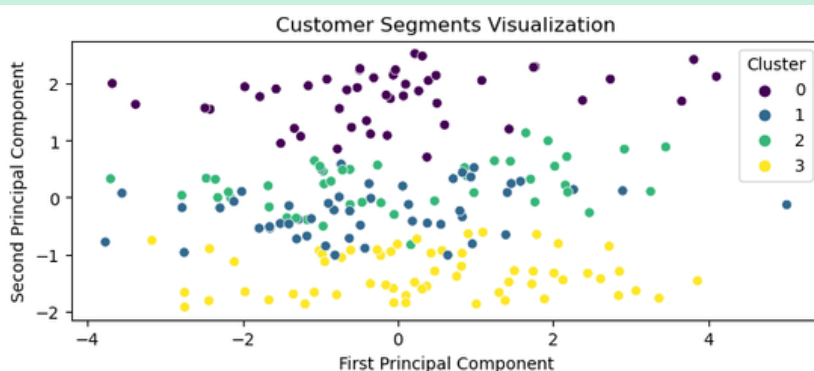
### Regular but Moderate Spenders

- Consistent but not excessive spending
- Mid-range order values, neither cheapest nor most expensive
- High purchase frequency, but low per-transaction spend
- Mix of long-term and newer customers

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### Niche or Specialty Shoppers

- Spend varies based on specialized interests
- Order values fluctuate - high for expensive items, low for small quantities
- Transactions may be sporadic or frequent for specific needs
- Concentrated in areas with high demand for niche products



## Visualization:

PCA was employed to reduce dimensions for visualization, plotting clusters in a 2D space, which helped in visually interpreting the cluster separation

## DB Index Value:

The DB Index for the 4-cluster model was **1.2513**, indicating a reasonable level of separation and compactness among the clusters

## Business Implications :

- Marketing Strategies: Tailor marketing campaigns to match the behaviors and preferences of each cluster.
- Product Offerings: Customize product recommendations or promotions based on cluster shopping patterns.
- Customer Retention: Design retention programs that cater to the needs of different customer segments.
- Inventory Management: Optimize stock based on the purchasing patterns identified in each cluster.