

Business Insights

1. Customer Segmentation:

K-Means clustering identified four distinct customer groups based on spending and purchase frequency. This segmentation highlights unique behavioral patterns, enabling tailored marketing strategies. High-value customers can be prioritized for premium services, while less-engaged groups may benefit from targeted promotions.

2. Sales Trends:

Monthly sales trend analysis revealed significant revenue fluctuations. The visualization suggests a focus on peak months for campaigns and optimizing inventory during slower periods. Seasonal sales insights guide resource allocation and promotional planning effectively.

3. Profitable Products:

Top 10 products contributing to revenue were identified through transaction data. Visual analysis highlights their demand and profitability, offering insights for optimizing inventory and focusing on high-margin products during marketing.

4. Revenue Prediction:

A linear regression model predicts revenue with features like quantity and price. Performance metrics (MAE, MSE, R^2) show reliable accuracy for forecasting. This insight supports informed decision-making in financial planning and demand estimation.

5. Customer-Product Interaction:

A network graph of customer-product relationships shows high-frequency transactions. Strong links highlight customer loyalty towards specific products, guiding personalized offers and retention strategies.