

Ecommerce Customer Segmentation Using Data Science For Targeted Marketing

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Abstract: *Customer segmentation is essential in today's e-commerce landscape, helping businesses create targeted marketing efforts and improve customer retention through personalized experiences. This study looks at how machine learning, specifically the K-means clustering algorithm, can be used to identify meaningful customer segments by examining behavioural data such as spending habits and use of discounts from a real-world e-commerce dataset. The process includes data cleaning, creating relevant features, normalizing the data, and using repeated clustering techniques to form distinct groups like "Premium Customers," "Budget Shoppers," and "Value Seekers." Through detailed testing and data visualization, it's shown that focusing marketing efforts on specific segments can significantly boost conversion rates, increase customer lifetime value, and support overall business growth. A comparison with other machine learning and statistical segmentation methods highlights the effectiveness of K-means clustering, making it a reliable tool for large-scale, easy-to-understand market analysis in ever-changing online retail settings. The research also explores how this framework can be adapted for real-time use and integrated with more advanced AI technologies, ensuring its usefulness as e-commerce environments and customer behaviours continue to change..*

Keywords: Customer segmentation, E-commerce, Machine learning, K-means clustering, Behavioural analytics, Targeted marketing, Personalization, Data-driven insights, Customer retention, Conversion optimization, Cluster analysis, Digital marketing

