**Introduction**

In the rapidly growing e-commerce industry, understanding customer behavior is crucial for businesses aiming to enhance customer experience and maximize revenue. Customer segmentation is a key strategy that allows businesses to categorize customers into distinct groups based on common characteristics such as purchasing patterns, demographics, and online interactions. This segmentation enables personalized marketing, optimized product recommendations, and improved customer retention.

Machine learning techniques, particularly clustering algorithms, have emerged as powerful tools for customer segmentation. Among these, K-means clustering is widely used due to its efficiency, scalability, and ease of implementation. K-means partitioning customers into clusters by minimizing intra-cluster variance, ensuring that customers in the same group exhibit similar behaviors. This approach helps businesses tailor their marketing strategies, design targeted promotions, and enhance user engagement.

This paper explores the application of K-means clustering for customer segmentation in e-commerce, discussing its methodology, benefits, and limitations. Additionally, it reviews existing research and real-world implementations, highlighting how clustering techniques have transformed customer analytics into digital retail.