



# Customer Segmentation of Cross-border E-commerce based on FRMD Using Unsupervised Machine Learning

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## Abstract

As buyers buy things from beyond national borders, cross-border e-commerce has quietly gathered significant momentum. E-commerce, which may be loosely described as the usage of the Internet as a medium for commercial transactions and the dissemination of market information, is expected to play an increasingly significant role in fueling economic expansion throughout the world. Under the assumptions of traditional mass marketing, consumers are all the same. The business has a unified strategy for producing, delivering, and engaging with customers, enabling it to save time and money while expanding its customer base to new heights. Companies relied much more heavily on mass marketing before consumer data was easily accessible. Big data has caused the proliferation of market segmentation. Market segmentation in the context of cross-border e-commerce is the process of identifying distinct groups of international customers and categorizing them so that targeted advertising campaigns may be developed. We extend the traditional FRM (frequency, recency, and monetary value) analysis to include the geographical distance of the foreign customers from the e-commerce company. This research used 3,000 overseas customer data from 8 different e-commerce stores. The unsupervised hierarchical clustering is based on four dimensions, namely, frequency of shopping, recency of transaction, monetary values of the purchased items, and finally, the geographical distance of the foreign customers. Companies of all sizes utilize market segmentation to hone their strategy and provide the highest quality products for their specific target populations.

**Keywords:** Cross-border, Customer segmentation, E-commerce, RFM, RFMD, Machine learning

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