

ABSTRACT

The rapid growth of the digital world is evident from the increasing number of e-commerce businesses, reaching nearly 3 million, and the projected number of e-commerce users in Indonesia estimated to reach around 131 million by 2028. This intense competition demands that companies implement effective marketing strategies to increase customer satisfaction and conversion rates. One approach used is consumer behavior analysis through the Market Basket Analysis (MBA) method with the Apriori algorithm to discover association rules from purchasing patterns. The dataset used consists of transaction data scraped from Tokopedia e-commerce. This research generated 32 best association rules, and the top 8 rules were selected for classification. The strongest association was found between the categories Steering Wheel and Game Boy, showing a confidence value of 88% and a lift of 112.97. These eight rules were grouped using the K-Means algorithm to define UI labels based on category combinations, then classified using Support Vector Machine (SVM) based on user keyword preferences. To improve classification performance, text preprocessing was carried out using Sastrawi and NLTK, followed by feature extraction using IndoBERT. To address class imbalance, the SMOTETomek technique was applied to achieve balanced data distribution. Among the kernel tests performed, the RBF kernel with parameters $C = 1$ and $\gamma = 0.01$ achieved the best performance with 90% accuracy. The resulting model is capable of predicting product labels based on user input keywords and recommending a list of relevant products.

Keywords: *E-commerce, Consumer Behavior, Market Basket Analysis, Support Vector Machine, User Interface*