

ABSTRACT

This study examines the application of the Support Vector Machine (SVM) method to analyze the sentiment of consumer reviews of Barenbliss brand lipstick products. This research is based on the increasing trend of online cosmetic shopping in Indonesia, especially through e-commerce platforms such as Shopee which stores many consumer reviews that can be used as a source of preference information. The main challenge in this analysis is the diversity of sentiment in consumer reviews that is unbalanced and must be appropriately classified into three categories that is positive, neutral, and negative. This research includes the creation of a classification system using SVM and text mining approaches, starting with the pre-processing stage of text. Features will be extracted using TF-IDF and data will be balanced using the Synthetic Minority Over-sampling Technique (SMOTE) method with a ratio of 2:3. To evaluate the stability of the model using k-fold cross-validation in conjunction with GridSearchCV to test variations of parameters such as kernel, gamma, and C values. Based on the test results, it was found that the use of a combination of RBF kernel parameters with C=100 and gamma='scale' gave good results, with an average accuracy of 90%. In addition, the model also shows high precision, recall, and f1-score values in all sentiment categories. This study makes a significant contribution to the application of machine learning-based sentiment analysis to support decision-making in the beauty industry.

Keywords: *Sentiment Analysis, Support Vector Machine, SMOTE, TF-IDF, Product Reviews, Text Classification*