

***Application of IndoBERT and Support Vector Machine (SVM) Methods for
Sentiment Analysis of Skintific Brand User Reviews***

Supervisor Lecturer: Didit Rahmat Hartadi, S.Kom, MT

Debby Az Zahra Firdauzi

Study Program of Informatic Engineering

Majoring of Information Technology

ABSTRACT

The rapid growth of the skincare industry in Indonesia has generated massive volumes of unstructured consumer reviews on platforms like Sociolla. To extract these insights automatically, this study develops an Aspect-Based Sentiment Analysis (ABSA) system integrating fine-tuned IndoBERT (as a 768-dimensional [CLS] feature extractor) and a Support Vector Machine (SVM) classifier under a Label Powerset approach. Utilizing 3,134 valid reviews of three Skintific products, class imbalance is resolved via Selective Over-sampling with Easy Data Augmentation (EDA), expanding the dataset to 3,424 samples. After filtering out rare classes (fewer than 3 samples), the remaining 3,310 reviews are divided using a 70:30 Stratified Multi-label Split (2,317 train and 993 test). Experimental results show that the combination of fine-tuned IndoBERT and Linear kernel SVM ($C = 0.01$) optimized via 5-Fold GridSearchCV yields superior performance. The model achieves an Exact Match Accuracy of 43.20%, Micro Precision of 70.28%, Micro Recall of 88.32%, Micro F1-Score of 78.27%, and a Hamming Loss of 5.10%. Stored MySQL outputs successfully map Skintific's strengths to Product Quality (2,280 positive) and Texture (1,258 positive), and weaknesses to Packaging (173 negative) and Price (163 negative). The model is deployed as a fully automated Single Page Application (SPA) combining Laravel 11, React.js, and FastAPI microservices for real-time sentiment monitoring.

Keywords: *Aspect-Based Sentiment Analysis (ABSA), IndoBERT, Support Vector Machine (SVM), Label Powerset, Skintific, Fully Automated System*