

***Comparison of SVM, LSTM, and IndoBERT Methods for Sentiment Analysis of
Riliv Mental Health Application on Google Play Store***
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ABSTRACT

User reviews of the Riliv application on Google Play Store are difficult to monitor manually, necessitating an automatic sentiment classification system. This study builds and compares sentiment classification models using SVM, LSTM, and IndoBERT on a dataset of 2,988 reviews distributed into positive (65.30%), negative (23.16%), and neutral (11.55%) classes. Preprocessing includes cleaning, case folding, tokenization, normalization, stopword removal, and stemming. SVM uses TF-IDF features, LSTM uses an embedding layer, and IndoBERT uses a Transformer-based tokenizer. Four class imbalance handling schemes were applied: Original, Weight Balancing, SMOTE, and Random Undersampling. An additional testing scenario was also conducted for IndoBERT without stemming and stopword removal to examine the effect of preserving the original text structure on Transformer-based model performance. Results show that IndoBERT without stemming and stopword removal at an 80:20 ratio achieved the highest performance with an accuracy of 0.9399 and F1-score of 0.9394, followed by IndoBERT with the Original scheme at an 80:20 ratio with an accuracy of 0.9181 and F1-score of 0.9143, SVM with the Weight Balancing scheme at a 90:10 ratio with an accuracy of 0.8896 and F1-score of 0.8856, and LSTM with the Original scheme at a 90:10 ratio with an accuracy of 0.8863 and F1-score of 0.8877. All three models were integrated into a website system built with Laravel and Filament, achieving a 100% success rate across 27 black box testing scenarios.

Keywords: *Sentiment Analysis, Support Vector Machine, LSTM, IndoBERT, TF-IDF, Riliv, Mental Health*