

ABSTRACT

The increasing public interest in personal care and beauty products has led to the growth of users in the beauty industry every year. All skincare products from various brands comply with the quality regulations set by the Indonesian Food and Drug Supervisory Agency, ensuring consumer safety regarding skincare ingredients. Beauty product reviews play a vital role in helping consumers determine the suitability and quality of these products. Platforms such as Female Daily Network provide valuable review information, which is considered important by consumers in choosing beauty products, as not all products meet their needs. To assist in this process, Aspect-Based Sentiment Analysis (ABSA) is one of the approaches in natural language processing that aims to identify specific aspects in a text and determine its sentiment. This study uses a combination of Convolutional Neural Networks (CNN) and Long Short-Term Memory (LSTM) methods, and integrates embedding techniques with IndoBERT. The experimental results show that CNN-LSTM with Global Max Pooling trainable embedding layer produces the best performance, with an average F1-Score of 85.99%. This combination is proven to be effective in capturing spatial features through CNN and understanding temporal relationships between words through LSTM. Meanwhile, the use of IndoBERT as an embedding does not always provide improved performance, because its complexity can add noise to the data representation, especially if not fine-tuned in depth. Furthermore, this study also evaluates the effect of various hyperparameter configurations, which shows that the combination of kernel size 3, filter size 64, LSTM units 100, dropout 0.5, and learning rate 0.001 produces the most optimal performance. Thus, the CNN-LSTM approach trainable embedding layer is the best choice for ABSA in analyzing beauty product reviews in Indonesian.

Keywords: *Aspect-Based Sentiment Analysis, CNN-LSTM, IndoBERT*