

ABSTRACT

This study aims to analyze multi-aspect sentiment in user reviews of the WhatsApp application obtained from the Google Play Store using a deep learning approach based on IndoBERT and BiLSTM. The dataset consists of 10,000 reviews that were labeled into three aspects (Service, Application Performance, and Additional Features) and three sentiment categories (Positive, Negative, and Neutral). The model was developed under a multi-task learning scheme to classify both aspects and sentiments simultaneously, with training and testing conducted three times using random data splits. The experimental results show that the proposed model achieved a macro-average accuracy of 96% for aspect classification with F1-scores above 0.94, and an average accuracy of 92% for sentiment classification. Among the aspects, Additional Features showed the most stable performance with 0.98 accuracy across all experiments, followed by Service (0.96) and Application Performance (0.95). Confusion matrix analysis revealed that misclassifications most frequently occurred in the Application Performance aspect, which was often confused with Service or Additional Features, and in Neutral sentiment, which was sometimes misclassified as Positive. Compared to previous studies using pure BERT or other architectures, the BERT-BiLSTM approach in this study demonstrated superior performance. These findings confirm that integrating IndoBERT with BiLSTM in a multi-task learning scheme is effective for handling the complexity of the Indonesian language in multi-aspect sentiment analysis.

Keywords: Sentiment Analysis, Multi-aspect, Bert, Bi-LSTM, Whatsapp