Analisis Sentimen Multi-Aspek Ulasan Pelanggan pada E commerce Shopee menggunakan Metode CNN-Bidirectional Long Short-Term Memory (BiLSTM)

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Abstract

Shopee is one of the largest e-commerce platforms in Indonesia, providing a customer review feature after each transaction. These reviews contain opinions on various service aspects such as product quality, seller service, and delivery process, which can be positive, negative, or neutral. This study develops an aspect-based sentiment analysis system to identify customer opinions more specifically. The dataset was obtained from *Shopee Reviews* on Kaggle and balanced to 45,000 reviews, with 15,000 for each aspect: product, service, and delivery. The analysis process includes text preprocessing, aspect detection using a keyword dictionary, sentiment labeling based on star ratings, and classification using the CNN-BiLSTM architecture. The proposed model is compared with BiLSTM, CNN, and three classical algorithms (SVM, Naive Bayes, KNN) using a 10-fold cross-validation scheme. Experimental results show that CNN-BiLSTM achieved the highest average accuracy of 73.22%, followed by BiLSTM (73.07%) and CNN (72.21%), while SVM was the best classical model with 65.38% accuracy. Aspect-level evaluation indicates that CNN-BiLSTM outperformed other models in most aspects, achieving F1-scores of 72.98% (Delivery), 66.17% (Product), and 80.81% (Service), although recall for the product aspect remains relatively low. These findings demonstrate that the hybrid CNN-BiLSTM approach is effective for multi-aspect sentiment analysis on e-commerce reviews and has the potential to serve as a foundation for more accurate customer feedback systems in the future.

Keywords: sentiment analysis, multi-aspect, e-commerce, Shopee, CNN-BiLSTM, text classification