

ABSTRAK

Pertumbuhan *platform E-commerce* di Indonesia menghasilkan ulasan produk dalam jumlah besar yang sulit dianalisis secara manual. Penelitian ini bertujuan mengembangkan sistem analisis sentimen ulasan produk pada *platform* Shopee dan Tokopedia menggunakan metode *Bidirectional Long Short-Term Memory* (BiLSTM) dengan tiga kelas sentimen, yaitu positif, netral, dan negatif. Dataset yang digunakan berjumlah 5.673 ulasan yang terdiri atas 2.680 ulasan Shopee dan 2.993 ulasan Tokopedia. Data diproses melalui tahapan *preprocessing* yang meliputi translasi, *cleaning*, *case folding*, normalisasi, *tokenizing*, dan *stemming*. Ketidakseimbangan data pada kelas sentimen diatasi menggunakan metode *Synthetic Minority Over-sampling Technique* (SMOTE), sedangkan proses pelatihan model menggunakan mekanisme *Early Stopping* untuk mencegah *overfitting*. Hasil penelitian menunjukkan bahwa model pada dataset Shopee memperoleh *accuracy* 68,84% dengan *weighted F1-score* 73,18%, sedangkan model pada dataset Tokopedia memperoleh *accuracy* 68,11% dengan *weighted F1-score* 73,15%. Performa model Shopee lebih baik dalam mengenali kelas minoritas dibandingkan Tokopedia karena distribusi data yang lebih seimbang. Penelitian ini menunjukkan bahwa BiLSTM mampu digunakan untuk klasifikasi sentimen ulasan produk, meskipun performanya masih dipengaruhi oleh ketidakseimbangan distribusi kelas pada dataset.

Kata kunci: analisis sentimen, *Bidirectional Long Short-Term Memory*, BiLSTM, *e-commerce*, SMOTE, *preprocessing*.

ABSTRACT

The rapid growth of E-commerce platforms in Indonesia has generated a large number of product reviews that are difficult to analyze manually. This study aims to develop a sentiment analysis system for product reviews from Shopee and Tokopedia using the Bidirectional Long Short-Term Memory (BiLSTM) method with three sentiment classes: positive, neutral, and negative. The dataset consists of 5,673 reviews, including 2,680 Shopee reviews and 2,993 Tokopedia reviews. The data were processed through several preprocessing stages, namely translation, cleaning, case folding, normalization, tokenization, and stemming. To address class imbalance, the Synthetic Minority Over-sampling Technique (SMOTE) was applied, while Early Stopping was used during model training to prevent overfitting. The experimental results show that the Shopee model achieved an accuracy of 68.84% with a weighted F1-score of 73.18%, while the Tokopedia model achieved an accuracy of 68.11% with a weighted F1-score of 73.15%. The Shopee model performed better in recognizing minority classes due to its more balanced class distribution. These findings indicate that the BiLSTM model is capable of performing sentiment classification on product reviews, although its performance is still influenced by class imbalance in the dataset.

Keywords: sentiment analysis, Bidirectional Long Short-Term Memory, BiLSTM, e-commerce, SMOTE, preprocessing.