

1. INTRODUCTION

In today's rapidly evolving digital era, online platforms like Traveloka have become essential resources for consumers to gather information and share experiences related to hospitality services. User reviews published on these platforms offer valuable insights into various aspects of hotels, such as their facilities, cleanliness, location, pricing, and service quality. However, the sheer volume and diversity of these reviews demand an effective analytical approach to accurately capture consumer sentiments and preferences. This is where Aspect-Based Sentiment Analysis (ABSA) becomes crucial, as it enables a deeper understanding of user opinions [1].

ABSA facilitates the identification of specific sentiments related to various aspects of hotel Services, offering a more comprehensive understanding of the customer experience. However, the use of pre-trained language models, such as IndoBERT and RoBERTa, in the Indonesian context presents several challenges. The differences in language structure and cultural nuances between Indonesian and English can impact the effectiveness of these models. Additionally, the class imbalance in the dataset, where certain sentiment categories are more prevalent, can introduce bias in the model's predictions. Consequently, it is crucial to adjust hyperparameters appropriately to enhance the model's performance in the ABSA task when applied to hotel reviews in Indonesia [2].

Previous research has shown that IndoBERT, as a variant of BERT specifically trained for Indonesian, has significant potential in ABSA tasks [1]. The customized IndoBERT model achieved an overall accuracy of 92.52%, with an F1 score for the positive class reaching 96.09%. The main advantage of IndoBERT lies in its superior ability to understand the context of the Indonesian language and filter sentiment more accurately than other models that are not specifically trained for this language. Although the model's performance on neutral and negative classes is still suboptimal, this is more influenced by the class imbalance challenge in the hotel review dataset [3]. On the other hand, although RoBERTa, a BERT extension with improved pre-training optimization, has demonstrated superior performance on various NLP tasks, this model has not been specifically applied to ABSA on Indonesian hotel reviews. This study aims to further explore the comparison between IndoBERT and RoBERTa in the context of ABSA for Indonesian hotel reviews, with a focus on hyperparameter optimization and tuning.

On the other hand, RoBERTa, an extension of BERT with enhanced pre-training optimization, has demonstrated superior performance across various NLP tasks. This model has been applied to emotion detection in Indonesian text, with hyperparameter tuning using the Bayesian Optimization method, achieving an accuracy of 83.64% [2]. However, this research has not specifically explored the application of RoBERTa in ABSA for Indonesian-language hotel reviews.

Moreover, several studies have suggested the integration of ABSA with a Zero-Shot Learning approach to efficiently analyze traveler reviews without requiring large annotated datasets. This method enables models to classify data without the need for specialized training, offering a potential solution to the data limitations often encountered in the context of ABSA for hotel reviews [4].

Hyperparameter tuning, especially the learning rate, plays a crucial role in optimizing the performance of the IndoBERT model. Previous studies have demonstrated that a learning rate of $2E-5$ yields the best results in classifying Indonesian exam questions, achieving a validation accuracy of 97% and an F1 score of 97%. This suggests a strong potential for enhancing model performance in Aspect-Based Sentiment Analysis (ABSA) tasks on hotel reviews [5]. These results underscore the significance of hyperparameter tuning in enhancing the performance of models in text classification tasks [2].

Sentiment analysis of Traveloka customer reviews was performed using SVM, Logistic Regression, and Naïve Bayes models. Although this study did not employ a transformer model, the findings offer valuable insights into customer sentiment towards Traveloka's services. These results can serve as a reference for understanding the context of hotel reviews on the platform [6].

Based on the current literature review, it is essential to compare the performance of IndoBERT and RoBERTa in the aspect-based sentiment analysis (ABSA) task for hotel reviews in Indonesia, considering appropriate hyperparameter adjustments. Enhancing the IndoBERT model for aspect-based sentiment analysis of Indonesian tourism-related user content could improve its performance in detecting sentiment for specific aspects, although challenges such as class imbalance and language variation still persist [7]. Furthermore, integrating Zero-Shot Learning into ABSA can enhance the model's effectiveness, even in the absence of extensive annotated data. This is especially relevant for hotel reviews in Indonesia, where data is often abundant yet imbalanced. By applying suitable hyperparameter adjustments, the model is expected to perform more effectively in extracting sentiment from hotel reviews on platforms like Traveloka. This research aims to address the gap in existing literature and contribute to the development of a more efficient ABSA model for analyzing Indonesian-language hotel reviews [4].

This study aims to make a substantial contribution to the advancement of a more effective ABSA model for analyzing Indonesian-language hotel reviews. With the growing popularity of platforms like Traveloka, conducting in-depth sentiment analysis of various aspects of hotels has become increasingly essential to better understand customer needs and preferences. Proper hyperparameter tuning can enhance model performance, enabling more accurate sentiment identification, particularly in cases involving ambiguous or unstructured text [5]. Furthermore, optimizing models like IndoBERT and RoBERTa is expected to improve sentiment recognition on imbalanced review data, as previous studies have shown that class imbalance remains a significant challenge in sentiment analysis [3]. Consequently, this research aims to address gaps in current ABSA methods and lay the foundation for more efficient and precise applications in hotel review analysis in Indonesia.