



Inspiring Excellence

Paper Review

“Sentiment Analysis of E-commerce Customer Reviews Based
on Natural Language Processing”

Course Title: Natural Language Processing

Course Code: CSE431

Name: Irfanul Hoque

ID: 21301232

Section: 02

Team No. : 45

Submitted To

Annajiat Alim Rasel

Senior Lecturer

1. Summary

1.1 Motivation/Purpose/Aims/Hypothesis

The research paper is motivated by the significant influence of women's apparel consumption in the e-commerce market. The purpose is to delve into sentiment analysis of customer reviews using machine learning algorithms. The aims are to ascertain the predictive correlation between review sentiments and product recommendations. The underlying hypothesis posits that advanced machine learning techniques can yield a deeper understanding of customer sentiment in e-commerce.

1.2 Contribution

The study's primary contribution is the application of five different machine learning algorithms to analyze sentiments expressed in women's clothing reviews. It advances the understanding of how customer feedback correlates with product recommendations and sets a benchmark for accuracy in sentiment prediction through the LightGBM algorithm.

1.3 Methodology

Methodologically, the research leverages a dataset from Kaggle featuring over 19,000 reviews. Statistical analysis establishes the dataset's framework, and TfidfVectorizer is utilized for feature extraction. Various machine learning models including Logistic Regression, SVM, Random Forest, XGBoost, and LightGBM are applied and optimized for the best performance, with parameters carefully selected to enhance the predictive capabilities of the models.

1.4 Conclusion

The study concludes that the LightGBM algorithm surpasses other models in predicting customer sentiment with the highest accuracy and AUC value, thus providing an effective tool for e-commerce platforms to analyze customer reviews and improve marketing strategies.

2. Limitations

2.1 First Limitation/Critique

One limitation of the study is the reliance on a single dataset which may not be representative of all e-commerce platforms or demographic segments. This poses a risk of overgeneralization and limits the scalability of the study's findings across different e-commerce contexts.

2.2 Second Limitation/Critique

The research also lacks a detailed exploration of the linguistic and cultural nuances that may affect sentiment analysis. The complexity of natural language and varied expressions of sentiment across cultures are not accounted for, potentially impacting the accuracy and applicability of the results in global e-commerce settings.

3. Synthesis

The ideas presented in the paper are crucial for the future of e-commerce, providing a blueprint for improving customer insight through sentiment analysis. The use of advanced NLP and machine learning can be extended to personalize marketing strategies, enhance customer service, and refine product recommendation systems. Future scopes could include expanding datasets to cover more diverse demographics and incorporating multi-lingual analysis, thereby improving the universal applicability of sentiment analysis in a global marketplace. The integration of these techniques could lead to a more intuitive and customer-centric e-commerce environment, fostering a proactive response to consumer needs and trends.