Understanding Customer Feedback - A Sentiment Analysis

Introduction

Sentiment analysis in retail helps businesses like NEXT plc analyze customer feedback for insights. This study focuses on aspect-based sentiment analysis (ABSA) to process customer interactions and uncover sentiment patterns for business improvement.

Objectives

- Develop NLP models for sentiment analysis.
- Align sentiments with customer ratings.
- Provide actionable insights for enhancing customer service strategies.

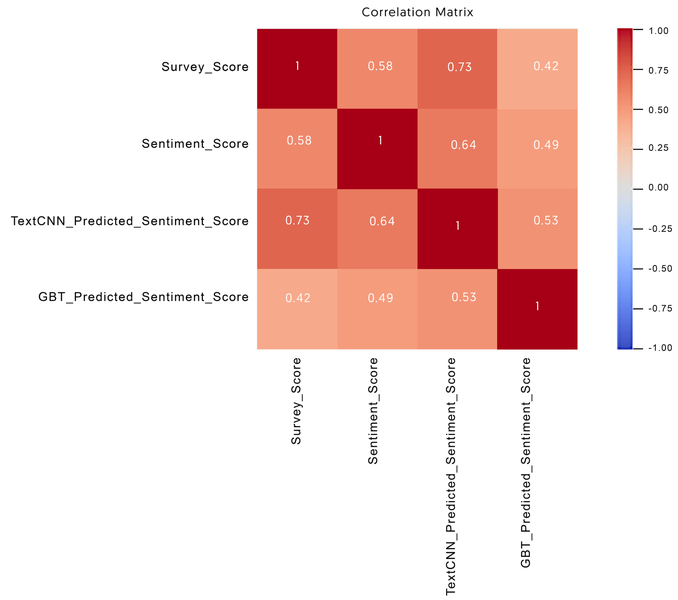
Methods

- Data Collection: Customer feedback data from NEXT plc, containing 732,621 textual entries with survey scores, sentiment scores, timestamps, etc.
- Data Preprocessing: Data type conversion, removing irrelevant columns, handling missing values, text cleaning, and tokenization.
- Model Development: Initially BERT and LSTM were tested but TextCNN was selected for ABSA efficiency.
- Hyperparameter Tuning: Optimized filter size, dropout rate, learning rate, and batch size.
- Gradient Boosting: Tested as a benchmark model.
- Model Evaluation: Metrics like MAE, validation loss, accuracy, and correlation matrix were used.

Results

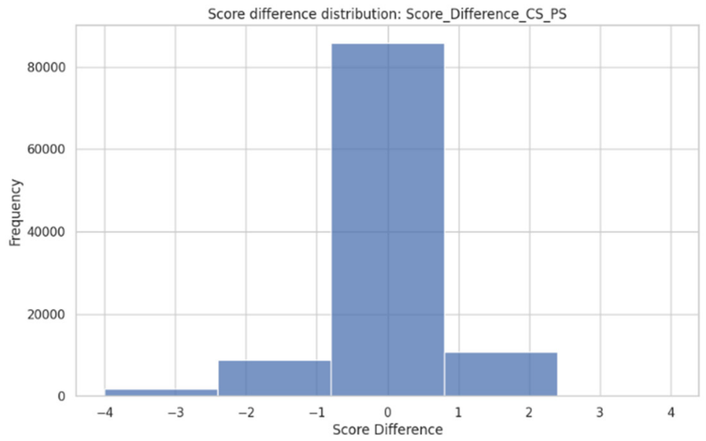
Model Performance:

- TextCNN: 0.80 accuracy, 0.35 MAE, 0.73 correlation.
- Gradient Boosting: 0.57 MAE, 0.42 correlation.
- BERT and LSTM were discarded due to high training time.



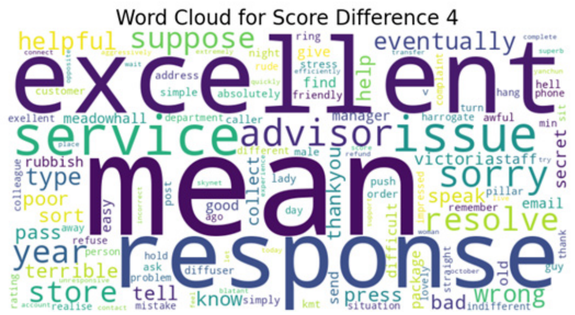
Sentiment Distribution:

- TextCNN predicted Positive sentiment well but struggled with differentiating negative sentiments.



Misclassifications:

- Misclassifications arose from potential customer confusion when rating interactions.



Insights:

- Positive feedback focused on product quality and delivery, while negative feedback involved customer service delays.
- Identified high and low-performing agents and departments based on sentiment scores.

Conclusions

It is recommended that NEXT plc:

- Adopt TextCNN for large-scale sentiment analysis.
- Refine the customer rating system to a 5-star rating.
- Use sentiment data for targeted training.
- Explore advanced models and multilingual analysis for future work.