Sentiment Analysis on Italian Hotel Reviews

Understanding Customer Feedback Through Data Science

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01 Introduction

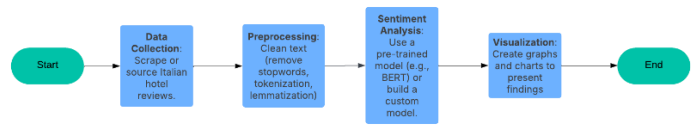
The hospitality industry relies on customer satisfaction, making guest feedback essential for improvement. Sentiment analysis, a natural language processing (NLP) technique, decodes emotions and opinions in reviews. This study explores predominant sentiments, service aspects influencing feedback, and variations across hotel types and seasons. Positive sentiments likely relate to staff friendliness and cleanliness, while negatives may involve noise or Wi-Fi. By analyzing Italian reviews using advanced NLP like BERT, it offers language-specific insights and actionable recommendations, addressing gaps in existing research.

02 Objective

This study looks to focus on these three key objectives:

- Analyze customer reviews to understand sentiment and its relationship with ratings.
- Identify factors that influence customer satisfaction based on reviews and ratings.
- Provide actionable insights to improve hotel services and customer experience.

03 Methodology



The figure above demonstrates the process for analyzing the dataset of Italian user comments from TripAdvisor, incorporating data collection, preparation, exploratory data analysis (EDA), modeling, deployment, and investigations.

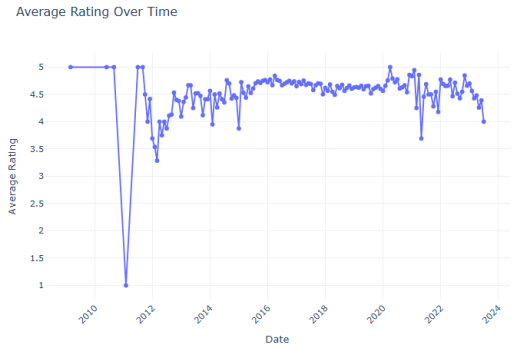
Sentiment analysis was conducted using a pre-trained BERT model for Italian text. The model was fine-tuned with AdamW optimizer, preprocessed data was converted into TensorDataset, and evaluated using DataLoader and confusion matrix for performance metrics.

04 Analysis

The BERT model effectively classifies sentiment in Italian hotel reviews, providing a robust framework for understanding customer feedback. Sentiment analysis reveals key factors influencing customer satisfaction, such as service quality and amenities. Visualizations offer actionable insights for hotel management, including improvements in Wi-Fi quality and staff training. Additionally, trend analysis identifies seasonal patterns and areas for continuous improvement, enabling data-driven decisions to enhance guest experiences.

The bar chart displays the distribution of sentiments across the dataset. It shows the count of Negative, Neutral, and Positive sentiments, with Positive being the most frequent.

The scatter plot explores the relationship between review length and sentiment scores. It helps determine if longer reviews are associated with stronger sentiments (positive or negative).



The line graph shows the average rating over time, revealing trends such as seasonal fluctuations or long-term improvements/declines in customer satisfaction.

05 Results/Findings

The study's results offer key insights into Italian hotel reviews through sentiment analysis.

- The training loss curve shows effective model learning, with loss decreasing from 0.704 to 0.694.
- The confusion matrix highlights classification accuracy, while the ROC curve (AUC = 0.50) indicates room for improvement.
- Positive sentiments dominate, with longer reviews expressing stronger emotions.
- Heatmaps reveal hotel rating-sentiment correlations, and line graphs show seasonal and long-term rating trends.

These findings provide actionable insights for enhancing hotel services based on customer feedback.

06 Conclusion

This study analyzed Italian hotel reviews using BERT for sentiment analysis. Key findings include: positive sentiments dominate, longer reviews express stronger emotions, and sentiment trends correlate with hotel ratings. The model showed effective learning but has room for improvement (AUC = 0.50). Recommendations include refining the model and addressing seasonal customer satisfaction trends for actionable insights.

Check out my Notebook: https://github.com/sharonowino/Sentiment-Analysis-on-Italian-Hotel-Reviews

Related Literature

Research Papers

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- Kaggle. (n.d.). *Datasets*. Retrieved from https://www.kaggle.com/

Articles

- Towards Data Science. (n.d.). *Practical guides on BERT and sentiment analysis*. Retrieved from https://towardsdatascience.com/