Sentiment Analysis on Online Product Reviews using Naive Bayes Algorithm with ChatBot Integration and Time Series Insights

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Abstract

With the rapid growth of e-commerce platforms, online product reviews have become a valuable source of information reflecting customer experiences and opinions. This research aims to extract meaningful insights from these reviews through sentiment analysis using Natural Language Processing (NLP) techniques. The study involves preprocessing textual data, applying sentiment classification to determine the polarity of each review, and analyzing patterns in customer feedback. To observe how sentiments evolve over time, time series analysis is conducted on review counts and sentiment scores. This helps identify trends, seasonality, and sudden shifts in customer perception. Additionally, an interactive dashboard is developed to visualize key metrics such as sentiment distribution, time-based trends, and commonly used keywords. The integration of sentiment analysis, temporal analysis, and data visualization provides a comprehensive framework that supports businesses in understanding customer needs, tracking product performance, and making data-driven decisions.

Keywords

Exploratory data analysis, time series analysis, machine learning, sentiment analysis, natural language processing, product reviews, text preprocessing, sentiment classification, naive bayes, anddata visualization.