Chapter 87
Recommendation and Sentiment Analysis Based on Consumer Review and Rating

Pin Ni
https://orcid.org/0000-0003-4516-1249
University of Liverpool, Liverpool, UK

Yuming Li
https://orcid.org/0000-0003-2219-9033
University of Liverpool, Liverpool, UK

Victor Chang
https://orcid.org/0000-0002-8012-5852
Teesside University, Middlesbrough, UK

ABSTRACT

Accurate analysis and recommendation on products based on online reviews and rating data play an important role in precisely targeting suitable consumer segmentations and therefore can promote merchandise sales. This study uses a recommendation and sentiment classification model for analyzing the data of beer product based on online beer reviews and rating dataset of beer products and uses them to improve the recommendation performance of the recommendation model for different customer needs. Among them, the beer recommendation is based on rating data; 10 classification models are compared in text sentiment analysis, including the conventional machine learning models and deep learning models. Combining the two analyses can increase the credibility of the recommended beer and help increase beer sales. The experiment proves that this method can filter the products with more negative reviews in the recommendation algorithm and improve user acceptance.

DOI: 10.4018/978-1-6684-6303-1.ch087

1. INTRODUCTION

Online review and rating, as the two most important customer reference factors in online shopping platforms, have a greater influence on consumers' willingness to buy. At the same time, e-commerce platforms or online advertising agencies also need to use these data as a basis to make accurate recommendations or advertising for customers with different preferences. However, rating data cannot reflect the specific characteristics of the product. And in many cases, reviews that lack rating data often make it difficult to judge the user's specific tendency of the product (especially in the case of ambiguous, overly simplistic or worthless reviews). Therefore, how to comprehensively use these two types of data to support the construction of a more intelligent recommendation system is a subject worth exploring.

This paper mainly analyses the data based on users' reviews on beer. However, the current researches focus on the intrinsic quality of the beer, and there are few researches on beer review and rating mining. Analyzing online reviews can not only help manufacturers develop products that are more in line with consumer preferences, but also promote sales. Therefore, the study is based on beer rating data and recommends beer products through the Spark-ALS collaborative filtering algorithm and compared 10 classification models including conventional machine learning and deep learning for consumer review analysis. Finally, a recommendation model based on Spark-ALS and LSTM was built to provide more accurate and credible recommendations.

Our main contributions are as follows:

1. We combine customers' review text data and rating data to support the construction of recommendation model and improve its effectiveness. Experiments have shown that our method achieves effective performance on beer product recommendation task;
2. Comparing 10 classifiers including mainstream conventional machine learning methods and deep learning methods for sentiment analysis task of recommendation model 3. We conducted a relatively comprehensive literature review of previous research in customer review mining, product rating analysis, and provided some technical and application analysis and suggestions for related business intelligence fields.

The rest of the article is structured as follows: Section 2 reviews the related works and is followed by the methodology in Section 3. The experiment description is presented in Section 4. Next, Sections 5 reports the result of the experiment. 5. Section 6 illustrates the limitations of the study, discusses, and analyzes the value of related tasks from both technical and application perspectives. Finally, the last section is the conclusion.

2. LITERATURE REVIEW

The reputation of the product has become an important factor for consumers to influence purchase intention. To a certain extent, it can be regarded as a filter in the current Internet environment with massive consumption information to help people make better decisions. Online reviews are one of the most important mediums that reflect the reputation of the product. And as an emerging field of Web information mining, online reviews' sentiment analysis involves a wide range of research topics, e.g.,