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Determining the helpfulness of e-commerce reviews of active reviewers

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Abstract

In many e-commerce platforms, user reviews assist the consumers in making a purchase decision of the product and it plays an important role in understanding the quality of the e-commerce platform's service, product, and features. Many e-commerce platforms allow users to engage with others' reviews through like/helpfulness vote, dislike, and comment. This helps users to see the quality of the review before reading the review itself. E-commerce platforms further rank the reviewers based on these votes or scores. The objective of this study is to determine the correlation between the sentiment score of the reviews and the helpfulness votes received for reviews of active reviewers. Helpfulness of active reviewers' reviews is important because they are the frequent purchasers of products online and this study is based on the assumption that the active reviewers possess greater product knowledge and their reviews could be helpful.

Keywords: e-commerce, reviews, customer reviews, active users, review helpfulness, sentimental analysis, correlation.

1. Introduction

Online product reviews on E-commerce websites greatly help other buyers to understand the credibility and performance of the product being considered for purchase. The availability of user product reviews also helps boost sales for E-commerce companies and adds value to the company's brand image and trust. So, most E-commerce companies have made provisions for buyers to review their purchased products and also to respond to the reviews of other reviewers. This helps buyers get a better understanding of the product's real-time quality and performance besides the default details available on the website. However, buyers also suffer from a lack of quality product reviews making it hard to distinguish helpful reviews from a multitude to reviews being posted for a product. To help users to identify the most useful reviews among the many posted, E-commerce companies like Amazon allows users to vote up or down for the reviews that they find to be helpful. This mechanism allows E-commerce companies to recommend the most upvoted or downvoted reviews to be first suggested to other users who visit the product page to understand what other buyers have said about the products that they are looking for to quicken their buying decision. However, this approach still suffers from an issue where there are no user reviews for a product which have been voted and thus making no possible way for companies to bring helpful reviews to the top of the ranking. This makes the problem still prevail among the users to scroll through the long array of posted reviews to identify the helpfulness of reviews manually. One of the effective ways to use the reviews available is to apply natural language processing to review texts in order to rate them upon their helpfulness using NLP analysis. In

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addition to this, there is also a popular assumption that the people who post many reviews in a product category could be trustable and thereby their reviews could also be considered helpful. So, our research here is to study the reviews of the active reviewers and compare its calculated sentiment score with its corresponding helpfulness vote. If the results of the sentiment score and helpfulness vote of the reviews of active reviewers reveal a strong correlation, then E-commerce companies can first examine the reviews of active reviewers which will save computation time and improve accuracy involved in the process of automated review recommendation. This active reviewer's approach can be of immense importance in building a recommendation system for customer reviews which is highly beneficial to the buyers to make decisions and companies to improve their brand credibility.

2. Literature Review

There are various factors are involved in a review and we need to understand those factors and the factors that influence the review helpfulness. The study by Hong, Xu, Wang, & Fan, (2017) focuses on how various review related and reviewer related factors contribute to review helpfulness. Methodology is based on combinations of correlations between variables. Results of the study shows that review age, review depth, reviewer expertise and reviewer information disclosure have positive influences on review helpfulness. Apart from various review related factors, time could also play a significant role in the reviews. The initial reviews that the products receive right after the launch are crucial for the business and also it would receive more reviews as the time goes. Hence, we would need to understand how temporal changes affect the review helpfulness. Referring to Lu, Wu, &Tseng (2018), the study finds that there is a temporal effect to the reviews and the helpfulness forms dynamically. Ignoring such factors may lead to biased review helpfulness. It also has important managerial implications and how managers can pay attention to high quality reviews. Combining all the above related factors, Wang, Wang, & Yao (2018), finds that review depth, review extremity and timeliness have varying effects on review helpfulness and it also confirms that there is significant positive relationship between review readability and review helpfulness.

The above research works have cited various factors proposed to evaluate the helpfulness of online reviews. Yet there is an absence of research in evaluating the review helpfulness with consideration of an active reviewer as a factor. This research focuses to answer if the reviews of active reviewers can significantly contribute to review helpfulness. Results from this study would help us to understand whether active reviewers' reviews are really valued by others. This would also help the e-commerce businesses to recommend reviews of active reviewers if the sentiment score of their reviews is found to be significant. Following hypothesis is tested for this study,

H1: There is a correlation between the estimated sentiment score of the reviews and the available helpfulness vote of the active reviewers' reviews.

3. Research Methodology

3.1 Method

The research methodology of the project involves a rule-based sentiment analysis approach to analyze the sentiments of the individual user's reviews and estimating the sentiment polarity that is associated with the reviews of the active reviewers. The research methodology included the use of Python programming for Natural Language Processing of the online review data. The study has adopted the NLTK library for the preprocessing of the review text and the rule-based sentiment analysis library VADER to analyze the sentiment orientation of the online reviews.

3.2 Stimuli development

Online consumer review analysis is a key method to understand the purchase satisfaction of the brand products through the review feedbacks provided by the customers and so companies invest a high amount of time and effort to understand the factors that contribute to customer satisfaction. Looking from the ends of the company's implementation of sentiment analysis in their business the stimulus being developed for the

study involves the inclusion of active reviewers, who are the most frequent reviewers of online products and this stimulus is used to examine if the active reviewers play a critical role in providing an honest and well-articulated review that is helpful to the brand and the potential customers of the brand who are looking to buy the brand product online.

3.3 Study participants and procedure

The data source for the study

The data source for the study is the Amazon open-source review dataset. The study includes the selection of electronics product category which holds 1,66,44,580 review sources. The dataset comprises attributes like Reviewer ID, Product ID, Reviewer name, Helpful vote, Total vote, Review text, Product rating, Review summary and Review Time.

3.4 Independent Variables

The study is performed ultimately to examine the correlation between the calculated sentiment score of the online reviews and the existing helpfulness vote for the respective individual reviews. As the analysis is essentially a correlation test, both the calculated sentiment score and the existing helpfulness vote of the reviews are both considered as independent variables.

4. Conclusion

Upon examining the correlation of the sentiment score and the helpful votes based on the methodology involved, the study results in a correlation score of 0.1 which nearly relates to a neutral correlation and thus suggesting that the consideration of reviews of active reviewers in calculating the helpfulness score of reviews by only using the sentiment analysis technique may not be a viable approach because of the lacking strong evidence of a positive correlation.

5. References

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