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DETECTING AND CHARACTERIZING EXTREMIST REVIEWER GROUPS IN ONLINE PRODUCT REVIEWS

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ABSTRACT

Online marketplaces often witness opinion spam in the form of reviews. People are often hired to target specific brands for promoting or impeding them by writing highly positive or negative reviews. This often is done collectively in groups. Although some previous studies attempted to identify and analyze such opinion spam groups, little has been explored to spot those groups who target a brand as a whole, instead of just products. In this article, we collected the reviews from the Amazon product review site and manually labeled a set of 923 candidate reviewer groups. The groups are extracted using frequent itemset mining over brand similarities such that users are clustered together if they have mutually reviewed (products of) a lot of brands. We hypothesize that the nature of the reviewer groups is dependent on eight features specific to a (group, brand) pair. We develop a feature-based supervised model to classify candidate groups as extremist entities. We run multiple classifiers for the task of classifying a group based on the reviews written by the users of that group to determine whether the group shows signs of extremity. A three-layer perceptron-based classifier turns out to be the best classifier. We further study behaviors of such groups in detail to understand the dynamics of brand-level opinion fraud better. These behaviors include consistency in ratings, review sentiment, verified purchase, review dates, and helpful votes received on reviews. Surprisingly, we observe that there are a lot of verified reviewers showing extreme sentiment, which, on further investigation, leads to ways to circumvent the existing mechanisms in place to prevent unofficial incentives on Amazon.

Keywords: online market, three layer, sign, online review.

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I INTRODUCTION

People search for various good products. This is due to large number of products in the world. Customers greatly observe the views of different peoples reviews to make decisions. For this, new system emerged called natural language processing. It help people to get products by seeing good reviews. Many people perform a lot of search to choose right products. Most of the people don't even know the right way to get products of their own interest. This Systems helps consumer to choose the product among so many options with use of the product reviews. It finds relevant items from number of attentions. It has a high commercial value and it provides personalized recommendations to users. Firms adopt these systems to gain benefits of the company. Popularity of the company can be explained in e-commerce site. These systems analyze databases of customer interactions with the web and produce useful recommendations. Data is usually in the form of purchase information (i.e., what items customer has purchased), ratings and reviews given by user, purchase behavior of other customers etc. This makes the system to help in Ecommerce sites use this system to attract customer to earn benefits. Customers can sit from their workplace and can get whatever products they want. They can use electronic modes for that. They approach some websites and search for products. E-Commerce sites give more option for the customer to choose. Customers select products and pay the amount through their cards such credit cards RS gives good recommendations to users or customers. These recommendations are used in E-commerce for the customers to choose best or right products based on customer interest. They give personalized recommendations to users. It allows users to sort out items which they want from huge set of choices. These personalized systems gather high importance since it allows user to get items from variety of products without loss in their taste.

II LITERATURE SURVEY

Sunkuru Gopal, Et.al. "A Hybrid Action-Related KNearest neighbour Approach for recommendation Systems" year: 2020 The better way was to base product recommendations not on similarities between customer but on correlation between product with user based collaborative filtering and k-nearest algorithm.

Mayuri G. Dabhade, Et.al. "A Result Review Analysis of Product Recommendation System in Domain Sensitive Manner" International Research Journal of Engineering and Technology (IRJET) Volume: 07 Issue: 07 year: July 2020 A system is used in various fields to show items of interest to users. One of the main areas where this concept is currently used is e-commerce sites that interacts directly with customers and the customer reviews by suggesting products of interest with the aim of improving the sales. Motivated by the observation, a novel Domain-sensitive algorithm is proposed, to make the rating prediction by exploring the user-item subgroup analysis simultaneously, and the collaborative system methods are used there.

Shubham Milind Phal, Et.al. "An Analysis of Machine Learning Methods for Ranking in Recommendation Systems" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 07 Issue: 05 May 2020 Several prominent e-commerce sites are using the recommendation systems in order to enhance the quality of user. Learned Ranking (MLR) methods have been used in a large number of information retrieval problems such as online-advertising, document retrieval. The ranking function is generally learned using either a Point-wise, Pairwise or a List-wise approach.

Babak Maleki Shoja, Et.al. "Customer Reviews Analysis with Deep Neural Networks for E-Commerce Recommender Systems", IEEE access, volume 7, year: Sept 2019 Product recommendation is drastically changing the revenue of e-Commerce companies. It estimated that product recommendation is playing a important role in the percentage of revenue generated by these e-Commerce companies yearly. Product recommendation is a vast area covering a different aspect of user expectation, behavior, needs interest, etc.

Benito Alvares, Et.al "Sentiment Analysis Using Opinion Mining", International Journal of Engineering Research & Technology (IJERT), ISSN: 2278- 0181, Vol. 5 Issue 04, year: April-2016 In this the Sentiment analysis is done for electronics products. Number of real and fake score is calculated by sentiment analysis and influencing factors identified from promotional marketing data and online review data. With influencing factors, sales or product demands are predicted by machine

learning methods, these literature Reviews has established social network analysis which did not combine customer sentiment/opinion on the different sites such as Social Network and E-Commerce website.

V.R.Azhaguramyaa, et.al. "Smart Product Recommender System using Machine Learning" International Journal of Advanced Science and Technology vol.29, No.9s year: 2020 In this system they used the collaborative filtering and content-based systems. Considering comments as an important piece of date, which needs to be processed in order to extract information out of it and possibly combine its use cases with other recommendation systems. The users' comments are extracted and filtered using the methods.

III EXISTING SYSTEM

There have been extensive studies on mining online reviews and classifying them based on user sentiment [8]–[11]. Reviews have also been extensively used in developing and augmenting recommendation systems [12]–[15] and extracting product features [16]–[18]. Another study has also shown the utility of product reviews in explaining the recommendations given by a recommendation system [19]. Pang et al. [20] showed the progression of reviews as an important part of the decision-making process with the advent of Web 2.0 and studied them from retrieval perspective. Since it is difficult for the buyer to wade through volumes of reviews, researchers have conducted studies on summarizing reviews based on user sentiment [21] and other features [22]–[24] as well under the umbrella of opinion summarization. All these studies indicated that product reviews are an invaluable resource for determining the quality of a product. Various marketing studies have also shown that reviews play an important role in maintaining the online reputation of a brand as well.

IV PROPOSED SYSTEM

no data set of consumer reviews (on Amazon) that consists of brand information exists so far. Thus, we attempted to create the first data set of its kind by crawling reviews from Amazon.in, the Indian counterpart of the e-commerce giant. In this data set, along with the regular metadata, we also obtained the brand on which a review was posted. Other metadata per-review include reviewer id, product id (ASIN), brand, rating, review text,

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date, and the number of helpful votes a review has received.

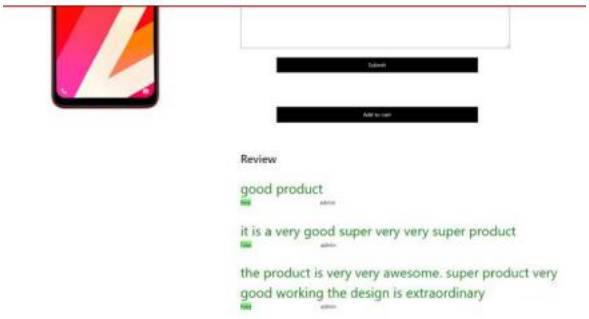
V METHODOLOGY

Registration and login: The customer will register in the website with their details name, numbers, address, etc. The admin will verify the details and approved. Then the customer will login and view the products.

Displaying Products: After logging in website, the product will be displayed. In the admin server, we can add or change the products.

Fake Review Detection: By clicking the product, the details of the product and reviews are displayed. Using the Collaborative Filtering and NLP (natural language processing) Algorithm the process is executed. The reviews are analyzed, the fake and true reviews are detected and shown on the side

Cart: After Fake review detection, If the customer needs to buy the product, then add the product to the cart for purchase.



CONCLUSION

The proposed system has the ability to check the review which are posted below each product are fake reviewed or not. This system can be used on the various sites where the reviews are posted and on some of the e-commerce pages are can be used to sort out

the real product reviews. The real product reviews which help the customer to pick up the good products by comparing the reviews posted on the site. In the process of detection, the collaborative filtering and the natural language preprocessing method are used to filters the reviews. In the sites below the posted review, it labeled which products is fake and which product is not are displayed.

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