A Review on Product Rating Behaviour Analytics

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Abstract: A business through internet with enhanced support to the customer is called E-Commerce. A trade which happens through the network and brings the customer wishes to their drawing room itself. The payment can also be done in two ways either cash on receipt or by on line. The services, payments and guidance for the usage of the product will completely by using web based technologies. Today in online business marketing and advertisement are made easy with widespread application through different mode of technologies. We all well known about Amazon, flipchart are the pioneers in the online business. Now, Amazon is selling more than 200 million products in USA under 35 categories. The online markets provide an open choice for every customer without making any feel about the product. So it is essential to get an opinion about any product before they get in to the purchase. This principle or the techniques is called as opinion mining. The opinion marking such as star rating helps them to put the confidence over the product as well as trust worthiness of a company. This research paper makes a survey about the customer opinion to promote the business not only in B2B, but also B2C etc.

1. INTRODUCTION

Nowadays, a company or organization provides a business service which needs to get feedback from customer .In today's competitive business environment understanding of your customer requirement and offering the right products at right time is the key of any successful business [1]. Due to high growth of internet, online shopping is becoming most interesting and popular activities for the consumers. Online shopping is providing a variety of products for consumers and is increasing the sales challenges for e-commerce players.

In online business the opinion about any product may differ from customer to customer in accordance with their age, sex and likings and taste. The opinion differs stands with so many factors. What are the benefits of this opinion mining is that either it directly or indirectly to instruct both the product manufacturer and also the buyers. This survey pool helps to identity

what to do and not to do. The number of customer review is increasing or huge from website, blogs, forums and social media, which the services or product is interesting. The comments from many customers can't be read by all therefore, many customers will read comment randomly. If customer reads a few reviews, customer might get opinion review to be bias. Therefore, opinion mining is a technique of field area of information extraction from text processing, which is benefit and many opportunities to improve or develop factor to business work by this analysis. The problem is the comments from customer review about products or services, which are contrast with comments.

2. RELATED WORKS

M. Alexander Muthurengan and R.Irene Hepzibah et al. proposed a new product rating approach for analyzing retail market of same type of products [2] from different manufacturers.   In Asian retail market there is no specific customer rating record. As an alternative, the retailers provide a feedback about the products based on the sales analysis. The Product Rating Retail algorithm is used to find the minimum threshold hypothesis for rating the retailer's analysis. They intended the Hungarian algorithm is to solve the problem by the mathematical approach.

Pinku Deb Nath, Sowvik Kanti Das, Fabiha Nazmi Islam and Mohammad Rashedur Rahman et al., targeted to classify the rating of individual products in an online shopping website based on price, discount, number of items left, sellers, count of likes and seller followers. They collected data from online shopping website for prediction is kaymu.com.bd which is an online store in Bangladesh. The product rating that they were going to predict gives the correct rating of each product that not only depends on a single user's rating but the overall rating considering views of every other user. It helps the user to decide what product to buy and how good it actually is.

Anurag Bejju et al., evaluated to propose [3] and improve traditional pricing strategies by using web mining techniques to collect information from e-commerce websites and apply data mining methods to induce and extract useful information out of it. Their proposed strategy can be generated by optimizing decision trees in an iterative process and exploit information about historical buying behaviour of a customer.

Rana Alaa El-Deen Ahmeda, M. Elemam Shehaba, Shereen Morsya and Nermeen Mekawiea et al., tested eleven [4] data mining classification techniques to find the best classifier fit for consumer online shopping attitudes and behaviour according to obtained dataset for big agency of online shopping. They also evaluated the accuracy of the system and they provided a recommender system based on decision table which helps the customer to find the products he or she is searching in ecommerce web sites[5].

P.Bharathi et al., highlighted [6] in their likings of the user rating. They applied   mining algorithm over through the two data set for the products Apple-iPhone and Samsung-Galaxy. The algorithm went through well with parameters for predicting the interest shown by the customer towards both products. The SVM gives better result in accuracy by 91% and CFA by 87% for Apple-iPhone and similarly for Samsung-Galaxy 81% for SVM and 73% for CFA. The overall research results produce best liking for Apple-iPhone rather than for Samsung-Galaxy. They conclude that in their research provides a better understanding for the promoters to enhance their product to bring buyers into the competitive market.

Archana Singh, Avinash Sharma, S. R. Yadav and Pushpa Singh et al., proposed a model which is mostly used for prediction in social network because of its high accuracy. They made a survey which helps to develop techniques for overcoming the issues of web item prediction. Also they discussed the web item prediction in a profound manner.

3. SOCIAL NETWORKS ON CONSUMER'S PURCHASE DECISIONS

The consumer behaviour may change due to environment around them such as family, friends, and coworkers. The impact of the purchase due to advertisement through the mass media such advertisement in news paper, television is very traditional. But nowadays, online social networks have power to affect consumers' purchase, by primary groups, secondary groups, informal groups, formal groups virtual groups and reference groups (online social networks).

The reference groups can influence consumer purchase decision three different ways:

1) Information about different kinds of brands by Informational influence,
2) Other in one's social group's satisfaction
3) Value-expressive influence, the existing or desired image, impression, or perception that others have of the consumer becomes important for him in order to choose particular brand.

4. ROLE OF DATA MINING IN PRODUCT RATING

Data mining is the process to discover patterns and obligatory details from huge amount of data collected from various sources for an era of time. The target of review is analyzing product rating behaviour through mining techniques. It helps the customer to make a decision or predict what product to buy at right time and how good quality a product really it is. In this survey we explore various data mining techniques based on either based on prediction or classifications.

4.1 Association Rule

Association rule is broadly accepted technique for finding frequent patterns, associations, or casual structures among sets of items. Using this, interesting relationships among the items

are searches from the given data set. Besides it helps to find the confidence level of the product from the database.

4.2 Naïve Bayes

Naïve Bayes is a probabilistic classifier using Bayes' theorem. It is based upon the priori probability of the prediction event, Bayes classifier uses the Bayesian formula to calculate its posterior probability, that the object belongs to the result classes, and then select the class with the largest posterior probability, as the event is most likely to have that result. If the prediction result is discrete, the Bayes classifier can be applied directly. Otherwise as well, the prediction result must be discretized first. This classifier has an assumption that the predictors must be conditionally independent.

4.3 K-Nearest Neighbor

K-Nearest Neighbor (KNN) is one of the simplest machine learning algorithms, which try to cluster the objects according to their distance to others. The Euclidean distance and Manhattan distance are the two commonly used methods to find out the distance measure. For two entities $p = \{p1,2,\ldots,pn\}$ and $q=\{q1,q2,\ldots,qn\}$ with n-dimensional feature vector. Then, the entity, which is being predicted, is assigned to the cluster including most of its K-nearest neighbors. Finally, the entity [7] is predicted to have the same output as the entities in its cluster.

4.4 Regression

In Regression, the mixture of different inputs are done like from dependent and independent variable, then social network input, product rating, etc. Because it is known that regression model is linear or non-linear. At this time linear model play good role as compare to non-linear one. So prediction model [8] needs to be linear from non-linear model. Now in-order to analyze work like sentiment analysis prediction model is non-linear as in. But in case of prediction base on numbers it will be linear.

4.5 Artificial Neural network

Artificial neural network is a computational model which simulates the human brain. The ANN consists of plenty of artificial neurons. These neurons could belong to several interconnected group such as input layer, hidden layer and output layer. The input layer is responsible for receiving [7] raw data and transmitting them to the next layer. The output layer will give us the final prediction result. As a consequence the artificial neural network provides better prediction.

4.6 Decision tree

In Data mining, Decision tree is an illustration technique. Travelling from root node to leaf, one entity will get the prediction result. Classification tree and regression tree are two basic

and major types of decision trees. Classification tree analysis is applied when the prediction output is discrete classes. Furthermore regression tree is used when predicted outcome is continuous value. Unlike the artificial neural network [9] being a black box model, the decision tree is a white box model, which could be relatively easily explained. As well, decision tree works well with dummy variables and empty variables.

4.7 Support Vector Machine

Support Vector Machine (SVM) is belonging in the supervised learning theory group which is comparatively very effective designed for classification, regression and clustering tasks. Comparing to other learning [10] algorithms, it could effectively handle high dimensional data space due to its unique ingredient of kernel. Different kernel functions can easily generate a set of decision functions even when the numbers of dimensions are greater than the total samples. During the data modeling [11] phase it learns a very little amount of data points those are close to data separating hyper plane and is it is called as support vectors. Hence SVM acts in the learning space as a memory efficient learning algorithm.

4.8 Model based prediction

It is the hardest way to do prediction. It is used to build a mathematical model on the object before prediction, which requires deep insight into the object. Although there is some progress in modeling, model-based prediction [12] remains an open and challenging topic.

5. CONCLUSION

Behaviour analysis is a way to identify the product rating and also determines the quality of the product. Many researchers focus their attention towards trend analysis and the promotional factors. The research outcome shows that customer opinion makes a significant role in manufacturing level also. The social network plays a vital role in marketing, advertising and also in product promotion rather than the traditional methods. Here further it is concluded that various analytical output provides and enhanced support in decision making process.

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