A New Feature Based Online Rating System for E-Commerce Websites

D. R. Kumar Raja¹, M. Ramu² and AKULA CHANDRA SEKHAR³

¹ Associate Professor, Sree Vidyanikethan Engineering College, Tirupathi, AP, India.
² Assistant Professor, Sree Vidyanikethan Engineering College, Tirupathi, AP, India.
³ Professor, Avanthi Institute of Engineering and Technology, Cherukupally(V), Vizianagaram District, India

E-mail: kumarraja.raj@gmail.com

Abstract. Online reviews and ratings are considered extremely important in any business. Any customer who wants to purchase a particular product online will have a look on the ratings before placing an order, any person who wants to book a hotel or restaurant in a particular location will have a glance on online ratings, any person who wants to choose a best hospital will check ratings. The question which arises here is how far the ratings can be reliable? The ratings cannot be trusted completely as they are not feature specific. The overall rating leaves the people in chaos and they cannot conclude that on which basis the ratings have been awarded. To overcome this problem feature based online rating is introduced. Where ratings for different features have been awarded separately. It helps people to take decisions easily and can purchase a product of their requirement. It helps in the growth of the business as customer satisfaction is equally important and it increases the quality of service.

1. Introduction

Online ratings are one of the most trusted sources of consumer confidence in e-commerce decisions. Due to the ease and availability of internet and due to the hectic schedule customer checks the durability, sustainability and availability while sitting at home. When it comes to online ratings, our herd instincts combine with our susceptibility to positive “Social influence”. When we see that the other people have appreciated a particular book, enjoyed a hotel or restaurant or liked a particular doctor and rewarded them with a high online rating, this can cause us to feel the same positive feelings about the book, hotel, restaurant or doctor and to likewise provide a similarly high online rating. Every customer will check reviews and ratings before purchasing the product [3,5,7]. For Example, before purchasing a product customer will do a survey. This is usually done by knowing from a person who is using it, by the respective person’s online review. If person is satisfied with one feature and still it increases the overall rating of the product. But the actual problem which arises here is if the person is taking a decision based on online rating, the respective person might be looking for other features rather than on which the
rating is given [4]. Hence it gives a mere dissatisfaction to the customer who purchased it and leaves customers in a dilemma that the products should be purchased or not, based on online rating.

2. Related Work
With the fast development of World Wide Web availability, our lives nowadays bank more and more on the Internet. Online systems permit an oversized variety of users to act with one another and provide thousands of films, lots of films and books, billions of web content for them to decide on [2]. Although plenty of helpful on-line objects are out there, accurately ranking their quality is quite difficult. Therefore, several online websites (such as Ebay, Amazon, and Netflix) introduce the supposed rating system, within which users can evaluate objects by giving distinct ratings [6]. To more or less decide the quality of a particular object, a user can refer to the historical ratings the object received [1]. Let us take an example of an e-commerce website such as Amazon. Suppose if someone is looking for a mobile phone with a good camera quality and fortunately if the purchased mobile phone excels in it. The respective person will reward a good rate in online review system.

![Fig 1: Product details in e-commerce website](image)

Figure 1 shows that the customers who purchased the product have rewarded with ratings based on their experience. The overall rating of product is 4 stars out of 5 stars. The rating can be depended on any feature such as Camera quality, internal memory, battery life etc.
Fig 2: Customer rating system

Figure 2 shows that the customer is satisfied with the product and thus have rewarded 5 star rating.

Let us take other example of hospital online rating system. Figure 3 shows that the patients who have visited this hospital have rewarded with stars based on hospitality, hygiene, workers, equipment’s, doctors etc. It is clearly shown in the figure that the hospital overall rating is 4 and a half out of 5 stars.

Fig 3: Star rating given by the customer

Figure 4 below shows the hotel booking website. The overall ratings below are 5 stars for resorts and can be based on features such as resort location, hospitality, food quality, cleanliness etc.

Fig 4: Hotel booking website

Above are the few examples for online rating systems in websites where online ratings are not feature specific. Before purchasing any product online in an e-commerce, the customer will check online ratings to know the general opinion. Before booking any restaurant or resort the person will have a glance on the resorts with a good overall rating. Before going to hospital for treatment a person will have a sneak peek on the online rating of the hospital. Nowadays online ratings is gaining popularity everywhere.
3. Problem Definition
Online rating is nowadays considered one of the most important sources of information for purchasing a product online, for choosing a best hospital for treatment, booking affordable resort. During the analysis of existing work, few problems are encountered. Suppose a person wants to travel and is looking for hotels or restaurants to stay. The respective person looks for online ratings given, based on cleanliness, hospitality, view, food quality, price etc. If the person is looking for a restaurant or a hotel with a good hospitality and the previous ratings were rewarded based on a good resort view or may be a for cleanliness. The person will face mere dissatisfaction for opting it.
Let us have a look on few more examples such as if a customer wants to buy a mobile phone online and the person is looking for phone with a good display quality. The mobile phone generally consists of other features also such as camera quality (front and back), RAM and internal memory, size, weight, Battery life, Connectivity, Performance etc. There are chances of awarding online ratings based on other features. Hence a person purchases a product for which he wasn’t looking for. Similarly, if a person is looking for a best hospital for treatment around the place. The person will do a survey and go fora hospital with good online rating. The rating is rewarded based on only one feature. The person might be looking for a hospital which is affordable. The ratings are awarded based on different criteria. It creates a sense of dissatisfaction to a person and hence can also result in a low rating. The ratings which are awarded are not specific. Hence the problem which arises commonly these days is that the customers who wants to buy product online cannot completely depend on online ratings for the product as the ratings may be given based on other feature performances. The opinions are discrete and hence online ratings cannot be trusted.
4. Proposed Work/Methodology
By analyzing all the existing review and rating processes we have observed that there is no clarity on the products rating and there is no feature specific rating of the product which helps the customers to buy a product based on a specific feature. In our proposed approach we are trying to concentrate on the feature-based rating process of the product by considering the reviews given by the users.
Let us take examples to understand it better. The attribute specific rating makes it easy for people to take decisions. Figure 5 shows the online rating of a hotel where the ratings are feature specific. The ratings are given below for Hospitality (4 stars), Food Quality (4 stars), Taste (4 stars), Cleanliness (5 stars), Price (4 stars), Spatial comfort (3 stars). The overall rating awarded is 4 stars. It shows if the person is looking for a hotel with specific feature like Food Quality, according to 546 votes it is clear that the restaurant serves delicious food or a person is looking for affordability the person can form a decision accordingly. It makes easy for travelers to form an opinion on the restaurant according to their need. If a person visits the restaurant, the person awards ratings for specific features accordingly. For food quality the opinion would be different from hospitality and so the ratings as well. Similarly, for the remaining features.
The biggest source for communication, mobile phones all over the world consist of many exciting features. Figure 6 depicts a phone with feature-specific online rating. Operating system (4 stars), Connectivity (4 stars), Performance (4 stars), Camera quality (5 stars), Display (4 stars) and Battery life (3 stars) depend on the various votes. It shows the feature-based rating of a product and makes the decision of the customer easy. If a customer wants to buy a mobile phone with good battery life, the person can take the decision accordingly. The overall rating is not specific and hence the customers are left with mere dissatisfaction.

Figure 7 shows the rating system of a hospital. The care quality or the hospitality (4 stars), expertise and competence (5 stars), healing environment (4 stars), cleanliness (4 stars), affordability (3 stars) based on the various votes from the customers who have visited it. The total overall rating awarded is 4 stars. If a person focuses more on hygiene, they can form the decision accordingly.
Fig 8: Rating of a hospital with features
The feature specific online rating system for any website such as for hotels, movies, e-commerce websites, hospitals etc. makes it easy for the customers to take decisions or to form opinions. The customers cannot rely upon overall rating system because they cannot conclude that on which basis the ratings have been awarded. Here feature based online rating system shows you a bigger picture.

5. Conclusion
Online ratings and reviews are a crucial part of business. These are the feedback given by the customers and hence are helpful to increase the quality of service. Customer satisfaction is generally the main motive in any business. The overall rating which has been awarded after purchasing and using any product in any e-commerce website, after visiting any restaurant or hotel, or after having treatment in any hotel is considered as a feedback from the people. The overall rating cannot be trusted completely as it can never be concluded that on which basis it has been given. Feature based online rating is reliable, different people have different opinions on different attributes thus the overall ratings is not justified. It contributes in the growth of the business as it can be derived easily from the ratings that the business is lagging in which part. That particular part can be modified to get the better outcomes in a business. It shows that your product excels in which portion and attract more and more customers towards it. Therefore, feature based online rating system in any website is considered to give better outcomes than normal rating system.

6. References
[1] Hao Liao, An Zeng, Rui Xiao, Zhuo-Ming Ren, Duan-Bing Chen, Yi-Cheng Zhang: Ranking Reputation and Quality in Online Rating Systems-method to effectively recognize the unreliable users and reduce their weight in judging the quality of objects, finally leads to a more accurate evaluation of the online products May 12, 2014
[2] Wenjing Duan, Bin Gu, Andrew B. Whinston: Do online reviews matter? — An empirical investigation of panel data- examines the persuasive effect and awareness effect of online user reviews on movies' daily box office performance 2008
[3] D. R. Kumar Raja, and Dr. S. Pushpa, "Feature level review table generation for E-Commerce websites to produce qualitative rating of the products", Future Computing and Informatics Journal (2017)118-124.
[4] Narahari P Rao et al., "Real Time Opinion Mining of Twitter Data", (IJCSIT) International Journal of Computer Science and Information Technologies, vol. 6, no. 3, pp. 2923-2927, 2015.
[5] D. R. Kumar Raja, and Dr. S. Pushpa, “An Approach To Construct MDRT To Produce Qualitative Ratings For E-commerce Websites”, International Journal of Computer Science Engineering and Information Technology Research (IJCSEITR) Vol. 7, Issue 1, Feb 2017, 9-14, 2016.
[6] Ravendra Ratan and Singh Jandail, "A proposed Novel Approach for Sentiment Analysis and Opinion Mining", India International Journal of UbiComp (IJU), vol. 5, no. 1/2, April 2014.
[7] D.R. Kumar Raja, S Pushpa, BS Naveen Kumar, “Multidimensional distributed opinion extraction for sentiment analysis - a novel approach”, 2nd International Conference on Advances in Electrical, Electronics, Information, Communication and Bio-Informatics (AEEICB), IEEE 2016.
[8] Piyush Gupta et al., “Sentiment Analysis on Hadoop with Hadoop Streaming”, International Journal of Computer Applications (0975-8887), vol. 121, no. 11, July 2015
[9] Sunil B. Mane et al., "Real Time Sentiment Analysis of Twitter Data Using Hadoop", IJCSIT International Journal of Computer Science and Information Technologies, vol. 5, no. 3, pp. 3098-3100, 2014, ISSN 0975-9646.