

A Trustworthy Reputation for Online Rating Systems

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Abstract: Now a days, the reputation of a product plays a major role in purchasing decisions. The average of all customer ratings on a product, which called as reputation. There is, however, no guarantee of the trustworthiness of a reputation since it can be manipulated rather easily. This model introduces trustworthy reputation for the products in online purchasing channels. It calculates reputation by considering both ratings and reviews of a product in online shopping systems. This system eliminates false reputation as the problem of a reputation being manipulated by unfair ratings and reviews. Here designs a general framework that provides trustworthy reputations. This system propose TRUE-REPUTATION, an algorithm that iteratively adjusts a reputation based on the average of customer ratings.

Keywords: Review Writing, TRUE-REPUTATION, Rating, Trustworthy Reputation

1. Introduction

Online shopping channels are platforms for consumers to share their purchasing experiences regarding both goods and services with other potential buyers via evaluation. The most common way for consumers to express their level of satisfaction with their purchases is through online five star ratings and reviews. The overall buyers satisfaction is quantified as the aggregated score of all ratings and is available to all potential buyers. This aggregated score for a product its reputation. Online rating systems are like reputation systems

Reputation systems are programs that allow users to rate each other in online communities in order to build trust through reputation. Some common uses of these systems can be found on E-commerce websites such as eBay, Amazon.com, and Etsy as well as online advice communities such as Stack Exchange. These reputation systems represent a significant trend in "decision support for Internet mediated service provisions". At its best, the use of reputation systems builds community, adds knowledge to groups, and elevates the accountability of the institutions and people who are being rated. Online reputation systems can enable people in

making decisions about which users to trust, or to compare their opinions to others.

These systems are used most commonly to assist with internet commerce for sites such as eBay.com, an electronic marketplace that allows members to market and sell goods and services online. eBay.com users can read feedback expressed by those who have interacted with a potential buyer or seller prior to making their own decisions. Other sites, such as epinions.com and Amazon.com, allow internet users to review a host of products and for others to respond to those reviews

With the popularity of online communities for shopping, advice, and exchange of other important information, reputation systems are becoming vitally important to the online experience. The idea of reputations systems is that even if the consumer can't physically try a product or service, or see the person providing information, that they can be confident in the outcome of the exchange through trust built by recommender systems. The reputation of a product plays an important role as a guide for potential buyers and significantly influences consumers final purchasing decisions . Is the Product's Reputation Trustworthy? Reputation is the score of a product obtained through collective intelligence, i.e., the result of collaboration between many individuals.

Thoughts on scale, binary and comment ratings marketplaces require rating system to evaluate the quality of the products/services listed as well as their providers. Most of the popular marketplaces around are using a variation or combination of scale (star, slider), binary (like/dislike) and written reviews. This post is my thoughts on each of the rating system and how they should be used.

1.Scale rating (5 star rating)

5 star rating can be found everywhere. It is a standard rating scale that's being used by popular marketplace sites like Amazon and most app stores. Because this system is so common, it is intuitive to average users in terms of how they interpret and cast the ratings (clicking on desire number of stars). Visually, star ratings are very appealing and noticeable compare to number or text (number of reviews), therefore it is easy for users to scan and compare a list of ratings at once. Lastly, scale rating is extremely powerful and flexible because you can

obtain feedback with great detail by increasing the number of scale level.

While it became almost a design pattern on marketplace sites, some designers argue that star rating is bad and ambiguous because users have different interpretation of each scale level and most of the time users either like something or they hate it. People also like to mentioned that You Tube switched from 5 star rating to a binary system, however it only demonstrated that their users were rating their videos in a binary way therefore it's logical for them to convert to a binary system and not necessary saying that binary rating is better than scale rating. Despite the flaws mentioned, star scale rating is extremely effective and should be used unless your user can benefit from a binary set up.

2.Binary rating (Thumbs up/Thumbs down)

A binary rating system is simple and effective. Many designers (here is one example) advocate binary rating over a scale rating because it is less ambiguous. Common social scores such as "like" and "follow" should be considered a form of binary rating (with like & no like). However, using "like" and "follow" can only be used to rank items but not enough for users to compare items with. In general, a binary rating system is suitable for sites that do not require complex review such as Reddit, Stack Overflow to simply separate good quality contents from the content pool. In terms of user experience, binary rating is easy to capture because it has less options and it's unambiguous. It can be a challenge to display the binary ratings in a visually appealing way but it is certainly possible (eBay presents binary feedback as 5 stars). Overall, binary rating is more user friendly when it comes to capturing and interpreting the feedback, however average users are not too used to seeing binary ratings especially on an online product marketplace.

3.Comment Reviews

Text reviews are potentially the most useful reviews that can provide great insights regarding a product, service or person. However, we rarely see an online marketplace use only text reviews because it requires the users to invest their time and energy significantly in order to provide one (especially a high quality feedback). Therefore, a text review is almost always presented as optional and paired with either a scale or binary rating. In sum, definitely try to capture written reviews and provide helpful hints/directions to help them think and leave a feedback.

2. Literature Survey

Stefano Grazioli and Sirkka L. Jarvenpaa[1] proposed consumer evaluations of a real commercial

web site and a fraudulent site that imitates it. The forged site contains malicious manipulations designed to increase trust in the site, decrease perceived risk, and ultimately increase the likelihood that visitors would buy from it. Besides measuring the consumer's willingness to buy from the site, this study recorded the actual ordering of a laptop. Results show that most subjects failed to detect the fraud manipulations, albeit a few succeeded. The fraud has the effect of increasing the consumers' reliance in assurance mechanisms and trust mechanisms, which in turn decrease perceived risk and increase trust in the store. The study confirms hypothesized relationships between purchase behavior, willingness to buy, attitudes toward the store, risk, and trust that are consistent with other trust models found in the literature. Past research is augmented by showing that perceived risk and trust interact in their effects on consumer attitudes, by distinguishing between the notions of assurance and trust, and by identifying the effects of perceived deception on risk and trust. Overall, the study sheds light on consumers' vulnerability to attack by hackers posing as a legitimate site.

N.D Sowmiya and S.Santhi[2] suggests scheme detective TATA, the acronym of joint Temporal and Trust Analysis, which guards reputation systems from a new angle: the blend of time domain anomaly detection and Dempster Shafer theory based trust computation. Original all user attack data collected from a cyber-competition is used to build the testing data set. Compared with two illustrative reputation schemes and our earlier scheme, detective TATA achieves a significantly better performance in terms of detecting items under attack, detecting malicious users who insert dishonest ratings, and recuperating reputation scores.

Asha Baby et.al[3] proposes A reputation system collects feedbacks from users and aggregates these feedbacks as evidence and generates the aggregated results to the normal users. These aggregated results are called reputation scores. This system called as online feedback-based reputation system. To protect the reputation system many defense schemes have been developed. This paper propose a defense scheme; it is the combination of five modules. Evaluation based filtering, Time domain unfair rating detector, suspicious user correlation analysis, trust analysis based on Dempster-Shafer theory and malicious user identification and reputation recovery. This system identifies the items under attacks, the time when the attacks occur and unfair raters who insert unfair ratings. Compared with existing systems this system achieves detection of high unfair ratings and reduces the detection of false dishonest ratings.

3. Proposed System

This paper describes the scenarios in which a false reputation occurs and propose a general framework that resolves a false reputation. The most common way to aggregate ratings is to use the average (i.e., to assign the same weight to each rating), which may result in a false reputation. For example, a group of abusers may inflate or deflate the overall rating of a targeted product. The existing strategies avoid a false reputation by detecting and eliminating abusers. However, abusers cannot always be detected, and it is possible that normal users may be regarded as abusers. Consequently, existing strategies can exclude the ratings of normal users or allow the ratings of abusers to be included in the calculation of a reputation.

In an online rating system, it is almost impossible to obtain the ground-truth data because there is no way of knowing which users have caused a false reputation in a real-life database. Here artificially establish various situations in which a false reputation may occur and test the performance of the proposed algorithm in these situations. In order to claim that the generated situations are likely to occur in real-life online rating systems, list various scenarios involving a false reputation and categorize them according to the types of user and situations. System define dangerous users who cause a false reputation and dangerous situations leading to a false reputation. Using the definitions of dangerous users and dangerous situations, here specifies the scenarios in which a false reputation occurs.

A. Dangerous Users

Based on observations of online rating systems, identified two types of abusers who present unfair ratings regardless of the quality of the product.

1. Planned Attacker:

A planned attacker is a user who "intentionally" manipulates the reputation of a target product(s) by giving unfair ratings. This user may be hired by a company to improve the reputation of its product or to damage the reputation of competitors products. Sometimes, planned attackers act as a group to influence public opinion on a target product.

2. Unplanned Attacker:

An unplanned attacker is either an extremist who evaluates the quality of a product according to "abnormal" standards or a don't carer who "without planning" provides meaningless ratings. An example of an extremist is a user who gives an extremely high rating to an author he prefers regardless of the quality of the book. An example of a don't-carer is the user who gives a meaningless high rating to a product to receive points or freebies from an online shopping mall. The ratings given by these unplanned attackers deviate from the general tendency of users

and create a distortion in a product's reputation, which in turn deteriorates the trustworthiness of its reputation.

B. Dangerous Situations

Most goods and services in online markets receive little public attention. In order to attract attention, companies attempt to generate positive public opinion about their products from the moment of, or even before, the release of products. The reputation of products at the early stage of the product life cycle (such as new movies or new books) can be easily manipulated. Dangerous situations in which a false reputation can occur are as follows.

1. Product Launch Phase:

Before the release of a new product, there is no customer experience on which to base an opinion. Online rating systems often allow users to evaluate products, such as pre release movies, before their release. Opinions at pre release can include vague expectations by unplanned attackers or manipulated opinions by planned attackers. Furthermore, the number of opinions about a product in the launch phase may be too limited to trust the reputation of the product.

2. Unpopular Products:

In online shopping malls, many products are unpopular with few ratings. Because of this, the overall opinion about the unpopular product appears to be untrustworthy.

In proposed system calculates reputation from both ratings and reviews. Trustworthiness of ratings and reviews checked by 3 parameters:

1. Activity

The user who rates more items displays a higher level of activity. The above description of activity implies that the activity is defined by the amount of interactions between an information producer and the users obtaining his information. There exist, however, no interactions between users in an online rating system; instead, there are actions by users on products. Therefore, we measure user activity in an online rating system based on the amount of actions by the user on products

2. Objectivity

A rating is considered more objective if it is closer to the public's evaluation (i.e., a reputation). The objectivity of a rating is defined as the deviation of the rating from the general reputation of the item. The more similar are the rating and the reputation, the higher is the objectivity of a rating; the more dissimilar they are, the lower the objectivity of a rating. Additionally, a user whose ratings exhibit higher objectivities should also have a higher level of user objectivity. The user objectivity is measured by the normalized average of the objectivities of the ratings submitted by that user.

3. Consistency

System define the user consistency as how consistent the user is in rating products; in other words, how consistently he keeps his objectivities of ratings.

Consumer can registered to the online rating system by giving name, phone number, email id username and password. After registration customer can logged into the system by entering username and password . Then customer can add rating and review to a product and he can also view the reputation and reviews of products. Also he can purchase items from this website. all the ratings and reviews are stored in the database. First of all reviews are converted into corresponding rating value. Then collects all these ratings along with actual rating value. Then system automatically checks trustworthiness of ratings by activity, objectivity, consistency. After collecting trusted ratings then find the average of all trusted ratings. This value displayed as reputation.

Algorithm for converting review to rating value

- 1.Fetch review stored in the database of that product}
- 2.Split review into parts removing special symbols, parts of speech, conjunctions and neutral words
- 3.Parts are then tokenized and spellings are checked.
- 4.Processor checks for the positive and negative words and value of the word.
- 5.The score is calculated
- 6.The score is then stored in the score database of the product.

The proposed online rating system collects reviews from customers to calculate reputation of product. This system also checks trustworthiness of reviews for computing more trusted reputation. For converting reviews from a consumer to its rating value the system uses sentimental analysis.

Sentiment analysis (sometimes known as opinion mining or emotion AI) refers to the use of natural language processing, text analysis, computational linguistics, and biometrics to systematically identify, extract, quantify, and study affective states and subjective information. Sentiment analysis is widely applied to voice of the customer materials such as reviews and survey responses, online and social media, and healthcare materials for applications that range from marketing to customer service to clinical medicine.

Generally speaking, sentiment analysis aims to determine the attitude of a speaker, writer, or other subject with respect to some topic or the overall contextual polarity or emotional reaction to a document, interaction, or event. The attitude may be a judgment or evaluation (see appraisal theory), affective state (that is to say, the emotional state of the author or speaker), or the intended emotional communication (that is to say, the emotional effect intended by the author or interlocutor).

In this online rating system also checks the rating get from consumer's review and rating given by the same consumer. If these two mismatches then review of that consumer never displayed in the website.

4. Conclusion

This paper defines the false reputation problem in online rating systems and categorizes various real-life situations in which a false reputation may occur. The understanding of why and when a false reputation occurs helps to establish experimental situations. In order to solve the false reputation problem, proposed a general framework that quantifies the confidence of a rating based on activity, objectivity, and consistency. The framework includes TRUE-REPUTATION, an algorithm that iteratively adjusts the reputation based on the confidence of user ratings. Through extensive experiments, showed that TRUE-REPUTATION can reduce the influence of various RAs. This papernalso finds that TRUE-REPUTATION is superior to the existing approaches that use machine-learning algorithms such as clustering and classification to solve the false reputation problem.

5.References

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