Reputation trust Score Evaluation for E-Commerce Using Feedback Rating and Comments

Vinaya Ramesh Firake
BE(IT),ME(CSE)

Abstract: Reputation trust is one of the important factors of the development of e-commerce to judge a seller’s degree of trust in terms of its past transaction. In e-commerce applications basically reputation trust scores for sellers’ is obtained by mining feedback rating given by customer. For computing reputation trust score the Reputation-based trust models are widely used. However reputation scores for sellers are universally high so it is tricky for potential buyers to choose truthful sellers-“all good reputation” problem. It is also experiential that although buyers may give high feedback ratings on transactions, they frequently express direct negative opinions on some aspects of transactions in free text feedback comments. The textual comments can provide detailed information that is not presented in feedback ratings. Mining feedback comments overcomes “all good reputation” problem. It is observed that many buyers don’t know how to reveal their views freely in text format. In this paper, we propose Reputation trust Score Evaluation for E-Commerce Using Feedback Rating and Comments.

I. INTRODUCTION

Buyers express their opinion openly in free text feedback comments. The users are attracted to online-shopping not only due to the ease of accessing the information of items on-sold, but also the accessibility of the other buyer's feedback based on their purchasing experience which is item-related and/or seller-related.

Reputation reporting systems [1] have been implemented in most of e-commerce applications such as eBay and Amazon, where feedback ratings are aggregated to get overall reputation scores for sellers. For example on eBay, the reputation trust score for a seller is the positive percentage score, as the percentage of positive ratings out of the total number of positive ratings and negative ratings in the past year. But the “all good reputation” problem [1], [2] is biggest problem in such a e-commerce system, where feedback ratings are over 99% positive on average [1]. Such strong positive rating cannot exactly guide buyers to select trusty sellers. Although buyers give positive feedback ratings, they express some dissatisfaction and negativeness in free text feedback comments [3], often towards specific aspects of transactions. For example, a comment like “The products is nice.” expresses positive opinion towards the product aspect, whereas the comment “Shipping was a slight slow but otherwise, best service. Like it.” Expresses negative opinion towards the Shipping aspect but a positive opinion to the transaction in common. By examining the information given in feedback comments we can discover buyers’ detailed embedded opinions towards different aspects of transactions and compute comprehensive reputation trust profiles for sellers.

The Reputation trust Score Evaluation for E-Commerce Using Feedback Rating and Comments System proposes a novel technique that uses a multi-dimensional trust evaluation model, for computing comprehensive trust scores for sellers in e-commerce applications. Here Reputation trust Score Evaluation system computes trust score not only based on feedback rating but also by considering
feedback comments in free text format which is most challenging task. The system computes dimension trust scores and the dimension weights. It automatically extracts the dimension ratings from feedback comments and by combining natural language processing with opinion mining and summarization techniques in trust evaluation to improve the accuracy for mining process and finally summing that comment rating with feedback rating.

II. IMPLEMENTATION DETAILS

In proposed system we consider multiple Dimensions such as 1. Product as described, 2. Communication with buyers, 3. Shipping time and 4. Shipping handling charges. For example consider feedback comment: “very bad communication will not purchase from again. Super slow ship(ping) but item is as described” this comment consist three different dimensions of transaction. So, here we computes dimension trust scores and the dimension weights and extracts the dimension ratings from feedback comments by combining natural language processing with opinion mining then summarization techniques is used for trust evaluation to improve the accuracy for mining process and finally aggregate that comment rating with feedback rating to compute reputation trust score for product and seller.

![Fig.1 Architecture of Proposed System: Reputation trust Score Evaluation for E-Commerce Using Feedback Rating and Comments](image)

Fig. 1 depicts the framework for proposed system. Where the Aspect opinion expressions, and their associated ratings (positive or negative) are first extracted from feedback comments. The Association rule mining for abbreviation and association rule mining for Neutral Comments are applied as comments in natural language. Then by using enhanced Latent Dirichlet Allocation (LDA) algorithm Dimension trust scores together with their weights are further computed by clustering aspect expressions into dimensions and aggregating the overall comment ratings with feedback rating given by buyer we generates the Trust Profile of the sellers.

2.1. Working of Proposed system consists of four main steps:
Step 1: Extracting aspect expressions and rating by typed dependency analysis:
We use a recent NLP tool helps to understand grammatical relationships in sentence. Here sentence is represented as a set of dependency relations between pairs of words in the form of (head, dependent) term. We call these (head, dependent) pairs as dimension expression.
Example of Typed dependency relation analysis:
We propose the Enhanced Lexical-LDA algorithm to cluster aspect expressions into semantically coherent categories ie dimension and computing dimension weights.

Fig.2 Step 2: Clustering Dimension Expressions into Dimensions:

**Step 3: Rating Evaluation:**
SentiWordNet is widely used public domain NLP resource to identify opinion polarities. When (modifier, head) pairs are grouped into dimensions; the associated modifier terms express the opinion priority of dimensions. SentiWordNet has a total of 155,181 words and each word is annotated with positive, negative and objective scores that are summed to one.

**Step 4: Computing overall trust score:**
Feedback Rating is the average of positive and negative feedback rating out of total number of feedback rating. Comment Rating is comported by aggregating the polarities of modifier terms in comment according to different dimensions. We computes sellers overall reputation trust score by aggregating overall feedback rating with overall comment rating score.
III. RESULTS AND DISCUSSIONS

For extensive experiments, 55,500 feedback comments were crawled for amazon sellers from amazon website for Jewellery portal. Based on feedback rating and comment we computes reputation trust score for seller. Here we randomly select four different sellers and make comparison between them according to four different dimensions baesd on feedback rating and comments. fig.4, fig.5, fig.6, fig.7 shows the generated graphical results according to four different aspects (dimension) of transaction as per our considered data sets. From all generated graphical results it is seen that seller3 is having highest reputation trust score as per feedback rating and comment rating.

![Fig.4: Comparison of different sellers according to product dimension](image1)

![Fig.5: Comparison of different sellers according to Shipping dimension.](image2)
IV. CONCLUSION

The “all good sellers" problem is well known for the reputation management systems of popular e-commerce web sites. It is observed that although buyers may give high feedback ratings on transactions, they often express direct negative opinions on aspects of transactions in free text feedback comments. We have proposed a multi-dimensional trust evaluation model for computing comprehensive trust profiles for sellers in e-commerce applications, which gives more accurate and also effective scores to rank the sellers. This model is good assistance to the buyers when doing online transactions, as to shield them from being a victim of fraud and untrusted sellers.

REFERENCES