

A Survey on Creating Trustworthy Seller Profile Using Multidimensional Trust Model

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ABSTRACT: E-commerce applications uses Reputation based trust models to greater extent. Reputation trust score for seller is obtained by aggregating feedback ratings. The “all good reputation” problem however is frequent in current reputation systems –reputation scores are invariably high for sellers and it is difficult for potential shoppers to select truthful sellers. In this paper, based on the observation that shoppers often express perspectives openly in free text feedback comments and by mining feedback comments we propose CommTrust Evaluation. Our main contributions include we propose a multidimensional aspects trust model for computing reputation scores from user feedback comments. To mine feedback comments for dimension ratings and weights an algorithm is proposed and uniting techniques of natural language processing, opinion mining and topic modelling. Large experiments on eBay and Amazon data demonstrate that CommTrust can efficiently address the “all good reputation” issue and rank the sellers.

KEYWORDS: Electronic commerce, Text mining, Multidimensional Trust Model.

I. INTRODUCTION

Data Mining is an important field to extract information and useful patterns from the large amounts of data. It is also known as Knowledge Discovery in Databases (KDD) and nontrivial extraction of implicit, previously unknown, and potentially useful information from data. It includes the technique approaches like data clustering, machine learning techniques, finding dependency network, analysing changes and detecting anomalies.

To extract useful information from raw data KDD process has following iterative sequence of steps.

1. **Data Cleaning:** The noise, redundant and inconsistent data contained by raw data is removed in this step.
2. **Data Integration:** The data from different sources is integrated together i.e., the data is combined.
3. **Data Selection:** The data relevant to the task is retrieved from the database.
4. **Data Transformation:** The data is transformed or consolidated into form appropriate for performing operation.
5. **Data Mining:** In this useful data patterns are extracted by applying intelligent methods. From the given data extraction of data is done.
6. **Pattern Evaluation:** The interesting patterns representing knowledge are identified based on given measures.
7. **Knowledge Representation:** This is the final step where the extracted patterns are visualized and represented to the users using different visualization techniques.

Success of e-commerce system is considered by accurate trust evaluation. All good reputation problems which occur with reputation reporting system like e-bay, Amazon which compute reputation score for sellers. All good reputation problems is issue considered with reputation management system like e-bay in which feedback ratings are overall 99% positive on average which causes potential buyer to select trust worthy seller existing system.

In the existing system, the work stated that, there was requirement for user to give feedback for particular service in terms of stars, such as more the number of stars, higher is the rating. Overall rating is obtained by averaging the ratings given by the user in which system averages the ratings on the scale of five.

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II. RELATED WORK

In our proposed system, we provide the option for user to give the feedback and rating we consider comments also not only stars. In this way, we are giving more flexibility to the users, and also it is more easy for anyone to describe their experience through words than stars. These comments are mined and converted into ratings. For analyzing the specific meaning of comments we tokenized them into individual words. Then these tokenized words are compared with our database for key words like “good”, “excellent”, “bad”, “mediocre” etc. and also with our database for key words like- “shipping”, “delivery”, “product”, “quality” etc. Then based on the keyword match and decide what will be the rating. For example the keyword “excellent” has higher rating than the keyword “good”, and the keyword “worse” has lower rating than “bad”. After combining the ratings of all the keywords and phrases in the comment, an appropriate rating will be arrived at. This proposed system is another way of arriving at an overall rating.

Techniques and Approaches

I. Computational trust evaluation:

The e-bay reputation system is well documented using strong positive rating bias[1]. In e-commerce application the buyers and sellers are referred to as individuals. The term like peers and agents are used to refer to individual. To rise good behaviours and ensure security and reliability of open system is used to developed reputation based trust models[1][3].

II. Feedback comment analyses:

In [6] discussed on sentiment classification of feedback comment analysis. It is demonstrated that analysing the noisy feedback is challenging problem. Missing Aspect comments are deemed negative and to classify comments into positive or negative model is used which is built from aspect rating [6]. Summarising technique for feedback comment is used to filter thoughtful comments which not provide real feedback [7].

III. Aspect opinion extraction and summarisation:

In aspect opinion extraction [6] and summarisation our work is related to opinion mining or sentiment analysis on free text document[10]. Opinion mining on frequent noun and noun phrases are considered as product reviews. Then work group into cluster using sentiment analysis[10]. Here all our work is based on lexical knowledge.

IV. LDA algorithm :

It is based on dependency relation analysis and LDA topic modelling technique to cluster the aspect into aggregated dimensions. Therefore, the Lexical-LDA algorithm to cluster aspect expressions into semantically coherent categories, which we call dimensions. Different from the conventional topic modelling approach, which takes the input taken is the document by term matrix Where as the Output is semantic clusters.

V. NLP Tool:

It is a mathematical tool used to analyze different languages like English, Chinese Which parse a sentence into meaningful words, categorize into required categories to analyze data for business requirements.

VI. Dependency Relation Analysis ,Lexicon Based opinion mining :

These are used for extract the aspects and identify opinion orientation.

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Architecture

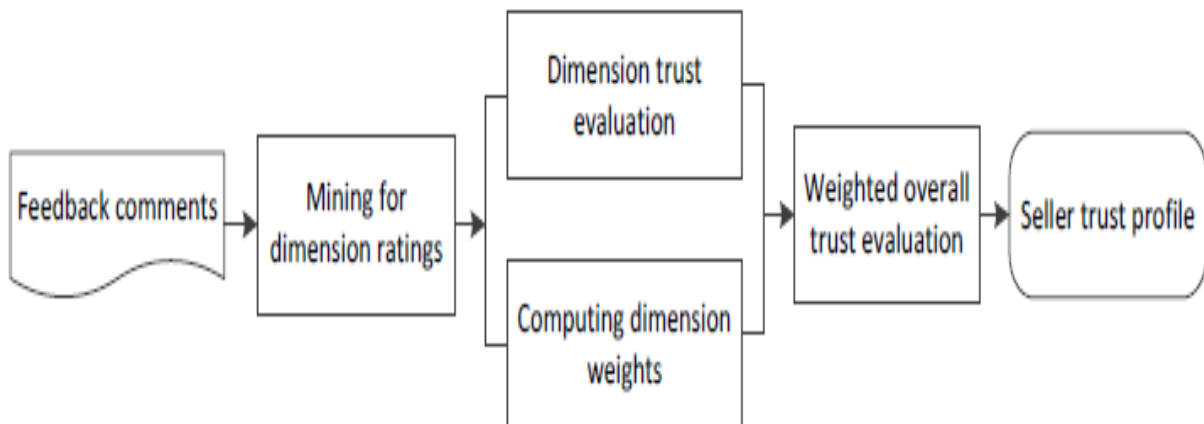


Fig1.Reputation analyser framework

I. Feedback comments :

Seller inspect feedback comments first of all in this process.

II. Mining for Dimension Rating :

Then classification of sentiments on feedback comments is done. After analysing ,aspect rating models are built to classify the comments in positive and negative rating. After broken the statements into meaningful phrases dimensions are extracted and then dimensions are mined so that rating can be given which result in trust evaluation step.

III. Trust Evaluation :

To extract meaning and ratings are given to the product for particular dimension which help in getting overall rating .

IV. Computing Dimension Weights :

Adding the weights of different dimensions and aspects to obtain overall rating for comments.

V. Overall Trust Evaluation :

Overall trust is evaluated to calculate trust coefficient of seller.

VI. Seller Trust Profile: Seller trust profile is created .

III. CONCLUSION

For computation of dimension trust scores and dimension weights automatically via extracting aspect opinion expressions from feedback comments and clustering them into dimensions we have proposed an algorithm. We have established approach that prove the novel application of combining natural language processing with opinion mining and summarisation techniques in trust evaluation for e-commerce applications.

REFERENCES

[1] P. Resnick, K. Kuwabara, R. Zeckhauser, and E. Friedman, "Reputation Systems: Facilitating Trust in Internet Interactions," Communications of the ACM, vol. 43, pp. 45–48, 2000.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 12, December 2015

- [2] L. Xiong and L. Liu, "A reputation-based trust model for peer-to-peer e-commerce communities," in Proc. IEEE Int. Conf. E-Commerce, pp. 275–284, 2003.
- [3] S. Ramchurn, D. Huynh, and N. Jennings, "Trust in multiagent systems," The Knowledge Engineering Review, 2004.
- [4] "Peertrust : supporting reputation-based trust for peer-to-peer electronic communities," IEEE Transactions on Knowledge and Data Engineering, vol. 16, no. 7, pp. 843–857, 2004.
- [5] P. Resnick, R. Zeckhauser, J. Swanson, and K. Lockwood, "The value of reputation on e-bay: A controlled experiment," *Experimental Economics*, vol. 9, no. 2, pp. 79–101, 2006.
- [6] J.O'Donovan, B.Smyth, V.Evrin ,and D.McLeod , "Extracting and visualizing trust relationships from online auction feedback comments," in Proc. IJCAI'07, 2007.
- [7] Y. Hijikata, H. Ohno, Y. Kusumura, and S. Nishida, "Social summarization of text feedback for online auctions and interactive presentation of the summary," Knowledge-Based Systems, vol. 20, no. 6, pp. 527–541, 2007.
- [8] Y. Wang and E. Lim, "The evaluation of situational transaction trust in e-service environments," in Proc. IEEE International Conference on e-Business Engineering, pp. 265–272, 2008.
- [9] "Latent aspect rating analysis on review text data: a rating regression approach," in Proc. the 16th ACM SIGKDD international conference on Knowledge discovery and data mining, pp. 783–792, 2010.
- [10] B. Liu, Sentiment analysis and opinion mining. Morgan & Claypool Publishers, 2012.