Trustworthiness in E-Commerce Context using TRS Algorithm

Prof. Reena Mahe[1], Rahul Jadhav[2], Pratik Gaikwad[3], Rahul Gadekar[4], Kiran Bhise[5]

Lecturer, Information Technology, Atharva College of Engineering, Mumbai, India[1]

Student, Information Technology, Atharva College of Engineering, Mumbai, India[2,3,4,5]

Abstract: Trust is an important factor in any sort of relationship. Lack of Trust is the main issue why people fear using E-Commerce for their regular shopping purpose, whereas E-Commerce is very much cost-effective as compared to traditional shopping. But people fear using E-Commerce just because there is no personal contact with the vendor .So it is a biggest challenge to remove this fear from the minds of buyers. The only solution to remove this fear is building Trust in their minds. While Shopping Online Buyers mostly depend on reviews from users available on various websites. Trustworthiness is a very critical element and should be treated as an important reference when customers try to select proper e-commerce systems. Trustworthiness evaluation requires the management of a wide variety of information types, parameters and uncertainties. In the implementation the project ensure that users give genuine feedbacks on the products. Trust Reputation Systems (TRS) Algorithm provide a most trustful reputation score for a specific product or service so as to support relying parties taking the right decision while interacting with an e-commerce application. TRS relies on an appropriate architecture and algorithms that are able to improve the selection, generation and classification of textual feedbacks. This algorithm studies the user's attitude toward this selection of prefabricated feedbacks. As a result of this study, the reputation algorithm generates better trust degree of the user, trust degree of the feedback and a better global reputation score of the product. This ensures that the product and services sold online get the prefect rating according to its capabilities and in turn helps the customer to make a right choice about which services or product to buy or whether not to, it will in turn help to build a trust in online transaction as there will be true product rating and trusted user reviews only.

Keywords: Trustworthiness, E-Commerce, TRS, Trust Reputation System, Trust Degree

I. INTRODUCTION

Trust plays an important role in any social relationship and especially in commerce transactions. Lack of trust may ruin the transactions or even lower the reputation of the product or the retailer. Even in Ecommerce trust play an important role for any transactions or products. As compare to traditional transaction, E- Commerce does not have any direct assessment of trust to it, so the users refer to the reviews of the products, in order to conceive their own trust and reputation experience. By this reviews of the product it trusts the product and purchases it, Therefore feedbacks or reviews, scores, recommendations and any other information given by users are very important for the trust reputation assessment. However the reliability of the reviews must be verified to ensure only genuine review is taken into consideration.

In such circumstances TRS plays an important role while gaining trust about the product. In TRS, users are generally considered as experienced people with interesting knowledge on the targeted product. This is why TRS is needed to provide trust and reputation to the score and reviews given to the product. Indeed, TRS are essential mechanisms that aim to detect malicious interventions of users whose intention is to falsify the Reputation score of a product positively or negatively. The main idea of TRS is to detect the users intention towards the prefabricated feedbacks provided it. The proposed design aims to provide the user with the possibility to give his opinion (like/dislike) on those prefabricated feedbacks.

Then the user is asked to validate its review and feedback. Then by his appreciation for the product and his trust degree the global trust score of product is calculated and the review trustworthiness is calculated.

The TRS aims to give only those reviews which are trustworthy and produces the global score of the product which will be helpful for the user while taking decisions in transactions.

II. LITERATURE SURVEY

Hasnae RAHIMI, Hanan EL BAKKALI's[1] paper gives the basic idea of trustworthiness and how it is measured in E Commerce site, it also explains the use of prefabricated feedback to give the user a trust degree and products its global reputation score. With the help of these two trust degree and the user appreciation about the product the products global reputation score is calculated and even the trust degree of the feedback given by the user.

Ankita Thakkar, Mrs. Deepali Vora[2] proposed a system which signifies the use of the semantic feedback given by the user to calculate the trust score of a product by the use of trust weight and trust scope of the person. This score and weight is then feeded into TRS system proposed to get the decision of whether to buy a product or not, which is helpful for the user in terms of decision making.

The system proposed by Gatha kumar, Durai Raj Vincent PM[3] gives the factors which are responsible for gaining

trust in online transactions and its impact; it also gives different techniques to validate this information. This factor helps in calculating the trust degree of the online retailing site and its contents. The system check the policies of the site and if it is ok it add the site to trusted E-Commerce site or else sends it for checking it repeats this procedure for all the contents and for all sites.

Hamed. F. Hamed Omar, Kamarudin Saadan, Osama S Hamad[4] proposed a system that expresses the main challenges that modern organizations are facing in developing countries nowadays with regards to implementing the e-commerce applications are the factors that affect the level of usability and security of e-commerce applications. It also describes technical problems associated with implementing and maintaining the high usable e-commerce applications for successful business online, and will evaluate the best solutions to overcome the obstacles that prevent the development of e-commerce applications with high quality and security. It also discusses technical security issues in terms of providing secure online payment mechanisms for e-commerce application, and the importance of secure payment mechanisms from customer perceptions.

The system proposed by Yi Yi Thaw, Ahmad Kamil, Mahmood, P.Dhanapal Durai Dominic[5] described the role of security, privacy and risk perceptions of consumers to shop online in order to establish a consensus among them. It also helps in finding suggested perceived privacy of online transaction on trust as mediated by perceived security, and consumers' trust in online transaction is significantly related with the trustworthiness of Web vendors. Also, consumers' trust is negatively associated with perceived risks in online transactions. However, there is no significant impact from perceived security and perceived privacy to trust in online transactions.

III.PROPOSED SYSTEM

The user first login to the E-Commerce site from which he wants to purchase a product, then after seeing it the user provides its feedback about the product. The feedback is then stored in the ordinary database. Those feedbacks can be fabricated in order to summarize numerous users' feedbacks which are stored in from which the database. The generated feedbacks can also be stored in another knowledge base. So as much as we add feedbacks in the ordinary data base, we will fill the knowledge data base with pre-analysed feedbacks. Trust Score are calculated using Trust Reputation System.

The user starts by giving an appreciation (rating) and a textual feedback about a specific product. When he clicks on submit in order to validate the given information, the site is going to redirect the user to another interface showing this message for example: "please give us your opinion about the following feedbacks before validating the information you gave below:"

In this interface the user is given a set of prefabricated feedbacks, he/she likes or dislikes them as per his review about the product. These feedbacks are already stored in the database; it can be modified or fabricated to

summarize numerous users. The generated feedbacks are stored in knowledge database. So as many as we add feedbacks we can use it to extract knowledge from it and implement it for fabricating other feedbacks. However, some users can give already summarized feedbacks that can directly be included in the knowledge data base.

Actually, before sending the users feedback and appreciation about the product to the trust reputation system, system have to verify the concordance between them in order to avoid and eliminate contradiction or malicious programs attacking the system. In the redirected interface, system will display several feedbacks from different types. However, the user can specify the number of feedbacks to be liked or disliked. Of course, the system can also specify the minimum and the maximum number of feedbacks to be displayed by the user.

By redirecting the user to prefabricated feedback page the system tries to detect and analyse the user intention behind his intervention on the E-Commerce application. The system examines and evaluates the user intention using prefabricated feedbacks of different types. The trust score of the feedbacks is already calculated and stored in the database. The system uses TRS algorithm to generate the users trust degree and with this and his appreciation a score of feedback is generated.
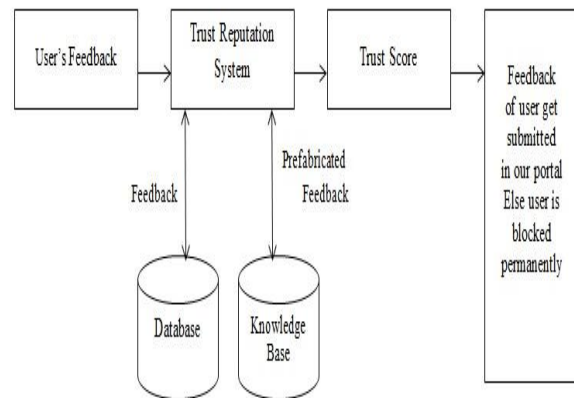

Fig.1. Block Diagram of Proposed System

Indeed, each feedback has trustworthiness in a threshold [-5, 5]. The closest is the trustworthiness to 5, the most trustworthy the feedback is. The closest is the trustworthiness to –5; the very untrustworthy is the feedback. If the feedback is trustworthy its score would be included in [0, 5] else it would be included in [-5, 0].

The system then generates the global trust reputation score of the product using the user's appreciation (rating) and his trust degree. The example of this method can be school marks and coefficient method. At school when the course was important for a particular field its coefficient would be higher and its effect of the marks would also be significant, similar way we can consider the user trust degree as the coefficient where as his appreciation as the marks. The higher his trust degree higher will be his appreciation rated. In order to calculate the global trust score of the product the system must sum the appreciation values multiplied by their respective coefficient divided by summation of all the coefficients.

The trust degree of the user and the global trust score of the product helps the user to make a right choice while purchasing product and thus ensures trust in E-transaction.
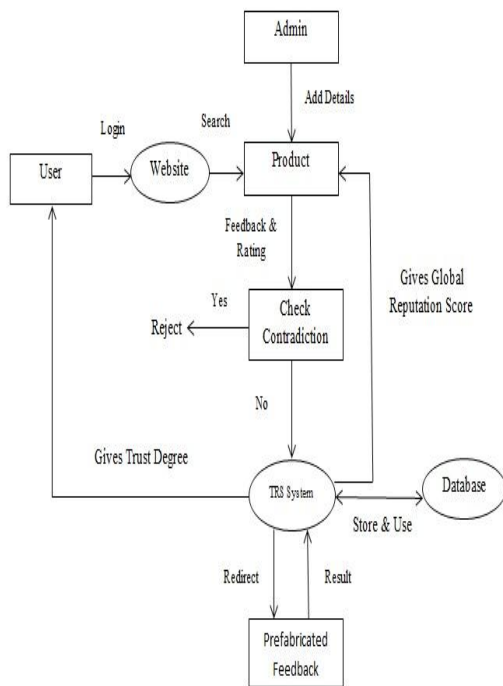

Fig.2. DFD Level 1 Diagram of Proposed System

The technologies and algorithms to be used in achieving this goal are explained in the next section.

IV. METHODLOGY

A. *TRS algorithm*

Reputation and trust must be assigned closely to web content in order to estimate usefulness of web content and to use its trustworthiness. Related to products and services, it is the subjective opinion based on feelings, past experiences and the viewpoint of a circle of "trustful" people. Reputation is often used in the sense of the community's general reliability and trustworthiness evaluation of a service entity. In this study the researcher uses a mixed approach Qualitative and Quantitative because the two approaches complement each other and also by using both approaches will help to make in accurate conclusion about the study variables such as the trustworthy factor of e-commerce application, and user's awareness in buying online.

TRS is a robust and secure algorithm used for calculation of trust degree of the product as well as user's. It gives the user a relative idea about the product and also helps him to make a decision whether to go through a transaction or not. The system allows the user to evaluate the reputation of a product, transaction, online merchant through the experience of other users. In virtual environments that apply reputation systems, users can decide whether to trust an online merchant based on the probable trust they have on the provider of the feedback. In E-commerce system the user are more likely to trust unknown and unreliable sources and unknown users but by using TRS algorithm

this could be stopped by giving the global reputation to product and user.

Therefore, this trust reputation needs to be gathered, collected and filtered in order to generate the most trustful reputation associated to a service, a product or a user.
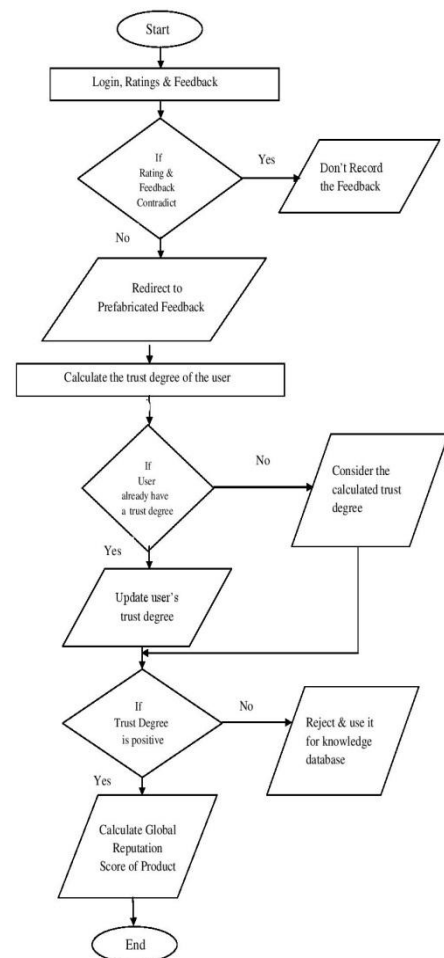

Fig.3. Flow Chart of Trust Reputation System

B. *Visual Studio*

The Microsoft Visual Studio development system is a suite of development tools designed to aid software developers—whether they are novices or seasoned professionals—face complex challenges and create innovative solutions. Every day, software developers break through tough problems to create software that makes a difference in the lives of others. Visual Studio's role is to improve the process of development to make the work of achieving those breakthroughs easier and more satisfying. The Microsoft Application Platform is a portfolio of technology capabilities, core products, and best practice guidance focused on helping IT and development department's partner with the business to maximize opportunity. As one of the core products of the Microsoft Application Platform, Visual Studio can help you drive the right business efficiencies, customer connections, and value-added services by providing a single, fully integrated development environment for all

types of development, including Microsoft Windows, Microsoft Office, Web, and mobile applications. Use Visual Studio development solutions to give your development team powerful ways to:

- Increase productivity and quality through integrated and familiar tools.
- Deploy, secure, and support your critical Web applications and infrastructure.
- Reduce costs through better visibility of your development process.
- Provide better predictability and planning through integrated process and methodology support.

C. *SQL Server*

Microsoft SQL Server 2005 is comprehensive, integrated data management and analysis software that enables organizations to reliably manage mission-critical information and confidently run today's increasingly complex business applications. SQL Server 2005 allows companies to gain greater insight from their business information and achieve faster results for a competitive advantage. Following are the benefits of SQL Server

- High Availability
- Performance and Scalability
- Security
- Manageability

V. CONCLUSION

Lack of trust is always considered as an obstacle to users dealing with electronic transactions. Trust Reputation System aims on creating trust score of the product and proposing it online to help user in transactions. These rating and trust scores helps the user in making a decision whether to buy a product or services online by the specific vendor. However some user may provide false feedbacks and scores of the product that will misguide the users while purchasing goods online to overcome this TRS ensures that false review and grading does not be displayed, it does it by discarding it. This approach is based on an intelligent layer that semantically analyses the user's feedback to determine its sentiment about the product and its trustworthiness. Besides, the Reputation Algorithm analyses the user's attitude toward the prefabricated reviews in order to calculate the trust degree of both the user and the product using a coefficient-average method. In future work, we aim to develop the Sentiment Orientation System and implement it with the Reputation Algorithm in order to obtain a simulation of the TRS and to evaluate its effectiveness in an e-commerce platform.

ACKNOWLEDGMENT

REFERENCES

[1] Hasnae RAHIMI, Hanan EL BAKKALI, "A New Reputation Algorithm for Evaluating Trustworthiness in E-Commerce Context", IEEE 2013

[2] Ankita Thakkar, Mrs. Deepali Vora, " Trustworthiness and Analysis of Sentiment of user's Semantic Feedbacks in E-Commerce", International Journal on Recent and Innovation Trends in Computing and Communication, Volume: 3, Issue: 2, February 2015

[3] Gatha kumar, Durai Raj Vincent PM, "The Measurement and Validation of Trust in E- Commerce Relationships", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 4, April 2013

[4] Hamed. F. Hamed Omar, Kamarudin Saadan, Osama S Hamad, "The Development of a Trustworthy Framework in E-Commerce Applications In Developing Countries", International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Volume: 2, Issue: 6, June 2013

[5] Yi Yi Thaw, Ahmad Kamil Mahmood, P.Dhanapal Durai Dominic, "A Study on the Factors That Influence the Consumers' Trust on E-commerce Adoption", International Journal of Computer Science and Information Security, Volume: 4, No: 1 & 2, 2009

[6] Audun Josang, Jennifer Golbeck, "Challenges of Robust Trust and Reputation System", 5th International Workshop on Security & Trust Management(STM 2009), Saint Malo, France, September 2009