International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 3 Issue 4, April - 2014

Item Ranking Approach for Multi Agent Review Posting and Secure Transaction Process

[1]K. V. Elamathi
Final Student M.E: CSE
M.A.M College of Engineering
Trichy, India

[2]A. N. Gnana Jeevan
Associate Professor: CSE
M.A.M College of Engineering
Trichy, India

Abstract— The e-commerce field has generated a compelling list of web attributes that engender credibility. One commonly cited study has identified few features of web sites that enhance consumer insights of the marketer's credibility. These web features include: (1) safeguard assurances, (2) the marketer's reputation, (3) ease of celestial navigation. In this paper, the different factors are analyzed related to assessing the trust of an agent and then propose a comprehensive quantifiable model for measuring such trust. Many agents have become popular in carrying adored and secured data above the network. Nevertheless, the undefended and vibrant nature of many agents has made it challenge for researchers to operate in a secured environment for information transaction. The graph based comparator is compared to many other important comparators which can be also compared to the input entity, it would be considered as a valuable comparator in ranking.

Keywords— ***Information Extraction, Weakly Supervised Bootstrapping Method, AES Encryption, Multi Agent Trust Computation, Graph based Ranking Method***.

I. INTRODUCTION

Recently, scholars and practitioners in the field of e-commerce have generated a compelling list of web attributes that engender trustworthiness. The web features include: (1) safeguard assurances, (2) the marketer's reputation, (3) ease of navigation, (4) robust order fulfillment, (5) the professionalism of the website, and (6) the use of state-of-the-art web page design technology. Beyond capturing these important web features, Cheskin and SA argue in establishing consumer trust is providing assurances that the consumer's personal information will be safeguarded. Many other scholars have strengthened this belief declaring that only after security concerns have been addressed will consumers consider other web features (i.e. reputation, ease of celestial navigation, transaction, integrity) to determine the extent to which they can trust and accept comfortable transaction with the marketer.

Yet it is unknown which indicators of trustworthiness (third party seals, privacy and security statements) work best are valued more by consumers. It is important to understand the factors that might influence consumer's intentions to use this mode of interacting with business. As discussed, one factor that is recognized as key for the continued growth of e-commerce is trust. Congruent with this, this study investigates trust in consumer oriented e-commerce. If transaction-oriented e-commerce is to be successful, the parties involved must properly assess the level of trust they should have in each other. For example, many potential consumers are reluctant to provide personal information to electronic commerce outlets. Clearly, one partner's lack of trust in the other may lead to reluctance to engage in the transaction. According to one study 9300 online consumers, three out of five consumers do not trust web merchants. To combat this fear, consultants frequently advise e-commerce web designers to include stated and authenticated policies of security (e.g. encryption and use of seals of approval) to communicate credibility to the consumer.

II. RELATED WORK

A. Overview

In terms of discovering related items for an entity, this work is similar to the research on recommender systems, which recommend items to a user. Recommender system mainly relies on similarities between items and/or their statistical correlations in user log data. For example, Amazon recommends products to its customers based on their own purchase histories, similarity between products. However recommending an item is not equivalent to finding a comparable item. Bootstrapping methods have been shown to be very effective in preceding research. This work is similar to them in terms of methodology using bootstrapping technique to extract entities with a precise relation. However the task is different from theirs in that it requires not only extracting the entities but also detects the strategic behaviors of malicious agents and then evaluating the agents in multi agent environment.

The exertion is related to comparable entity mining from comparative questions. Weakly supervised bootstrapping method have been developed which identifies the relative questions and extract reliable comparators.

B. Weakly Supervised Method for Comparator Mining

Weakly supervised bootstrapping method is a pattern based approach that aims to learn the sequential patterns. It is used to identify the relative questions and extract reliable comparators. IEP mining approach i.e. indicative extraction pattern mining approach performs extraction with high consistency. When the customer make a search for any product or items in online then the system will automatically compare the alternatives and reads all the reviews posted by the already purchased customers. It then calculates the precision and average precision and provides ranking for the

patterns using comparability based ranking method. When the question is received from the customer then the system matches it with IEP and classifies it as comparative and non-comparative questions. The token sequences corresponding to the comparator slots in the IEP are extracted as comparators. IEP is acquired from the bootstrapping procedure, first it extracts initial seed comparators then pairs in question from the question collection are extracted. By combining both it generates sequential patterns and evaluates the patterns whose value is more than the threshold. The reliable patterns are stored into IEP repository; for the next iteration the system is allowed to find new patterns until no more new patterns can be found in question collection.

The aid of this paper can be summarized as the people make important purchase conclusions based, in part, on their level of trust in the product, sales person, and/or the company. Similarly, internet shopping decisions involve trust not simply between the Internet mercantile and the customer, but also among the customer and the computer system through which transactions are executed. While many studies have identified the critical role of consumer trust in internet shopping, a critical issue has hampered empirical investigations of the impact of consumer trust on on-line purchasing activities. The issue is centered on the lack of agreement about the definition of online customer trust.

Most of the existing global repute models can successfully isolate malevolent agents when the agents behaved in a expectable manner. However these models suffer greatly when agents start to display vibrant personality. These models also fail to adapt the abrupt changes in the behavior of agents and as a result it suffers when agents alter their activities strategically.

III. PROPOSED SYSTEM MODEL

In e-business environment, Trust Management is an important aspect that is necessary for all the communications. The elementary e-business desires like non-reputation for both agent and of trustier are found to be the problem that arises due to lack of trust information. The main result derives: an agent's discount factor is a direct measure of its trustworthiness given assumptions. A key motivation for work on trust is that the primary interaction mechanism is not incentive compatible.

Advantages

- A Graph based measurement is to enable aggregation then the agents can communicate about trust and it is applicable across multiple situations.
- Automatic and accurate ranking by the server system are evidence-based and possible to aggregate.
- The review for new launch products will be zero and ranked at last. Such products are separated to avoid misreport.
- The hacking of feedback may occur. So it provides secure review hosting to avoid the misuse by the other agent.

A. Modules Description

1) User Interface Design
2) Agent Enrollment Module
3) Agent Selection and Product Purchase
4) Secure Process

1) User Interface Design

- The user interface design facilitates finishing the task without illustrating unnecessary attention to it.
- The user interface designs make the interaction of user as simple and efficient as possible and is often called user-centered design.
- Graphic design can be utilized to support its usability.
- The design process must balance strict functionality and visual elements.
- So that it can be used to create a system not only effective but also usable and adaptable to varying user needs.

2) Agent Enrollment Module

- Administrator plays a role of interface between agent and the customer. Maintain the database and the products in the shopping links.
- Agent details and customer registration also maintained by administrator. The whole process and flow of data's of this website is maintained.
- Only the valid agent can perform the enrollment of items for the customer into the agent and element store. For the agent discount factors are provided from the database.

3) Agent Selection and Product Purchase

- The customer sends item request and selects the agent among multi agent based on discount factor to make a purchase and enters the agent authority key.
- The agent validates the authority key and allows the customer to make a purchase then the feedback of the customer stored into the database.
- Peer Trust computes the trustworthiness of an agent as normalized response biased against the credibility of feedback originators.
- FC Trust differentiates the role of providing feedbacks from that of provided services.

- The system itself reads all the feedback for a particular product and calculates the precision then the rating of feedback gets displayed.
- It creates separate group for new product and the product remains in it for few days after it gets feedback, based on the precision gets rated.
- Only the authorized agent can retrieve the agent details from the database to perform updating or deletion and stores back to the database.

4) Secure Process

- The stored feedback may be hacked from the database and make any changes or even deleted by the unauthorized agent.
- So it provides security for the stored data in the database using AES algorithm
- By validating the agent key it avoids the response from other than the original agent.

IV. SYSTEM OVERVIEW

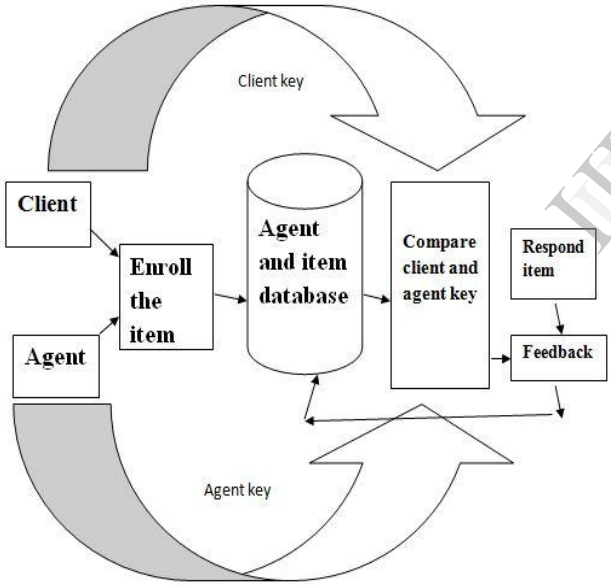

Fig.1. System Architecture

The architecture of the system is presented in Fig. 1. In the above figure, the customer and agent enter into the system by giving login id and it is validated. Only the validated agent enrolls items from the agent and item database. For the agent the discount factors based on desired data are provided from the database. The customer performs online shopping by sending item request to the agent and items database. Then the customer selects the agent to make a purchase and enters the agent authority key. The agent verifies the authority key and responds by sending the item details to the customer.

The customer makes a purchase and sends the feedback that gets stored into the agent and items database. The cryptographic key algorithm allows only the authorized user to make changes in the feedback stored in the item database. The stored feedbacks are retrieved from the database then perform the rating process and displayed by using Graph based algorithm.

V. AES ENCRYPTION ALGORITHM

The encryption process uses a set of specifically derivative keys termed as round keys and it can be applied to other processes. The following steps to perform encryption of a 128-bit block:

- First derive the fixed set of round keys as of the cipher key.
- Then the state array is to be initialized with the block data.
- To the starting state array, add the initial round key.
- The nine rounds of state manipulation are to be performed.
- Then the tenth and final round of state manipulation is to be performed.
- The final state array out is copied as the encrypted data.

The cipher is specified in terms of repetitions of processing steps that are applied to make up rounds of keyed transformations between the input plain-text and the final output of cipher-text. A set of reverse rounds are applied to transform cipher-text back into the original plain-text using the same encryption key.

- `Sub Bytes` - a non-linear substitution step where each byte is replaced with another according to a lookup table.
- `Shift Rows` - a transposition step where each row of the state is shifted cyclically a certain number of steps.
- `Mix Columns` - a mixing operation which operates on the columns of the state, in each column the four bytes are combined.
- `Add Round Key` - each byte of the state is combined with the round key; each round key is derived from the cipher key using a key schedule.

Algorithm for AES Encryption:

Cipher (byte in [4*Nb], byte out [4*Nb], word w Nb*(Nr+1)])

Begin

Byte state [4, Nb]

State = in

Add Round Key (state, w [0, Nb-1])

For round=1 to Nr-1

Sub Bytes (state)

Shift Rows (state)

Mix Columns (state)

Add Round Key (state, w [round*Nb, round+1)*Nb-1])

End for

Sub Bytes (state)

Shift Rows (state)

Add Round Key (state, w [Nr*Nb, (Nr+1)*Nb-1)

Out = state

End

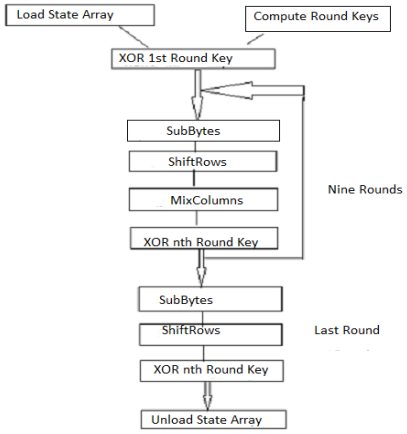

Fig.2. Summary of AES Encryption

The process of encryption can be summarized as shown in Fig. 2. The mathematics behind the algorithm is rather hard to understand for non-mathematicians and all the operations are based on byte values and operations that are simple to implement in arithmetical logic gates. AES attains the goal of being both secure and practical for real systems.

VI. MULTI AGENT TRUST COMPUTATION MODEL

This model provides a secured trust for effectively assessing the trust of agents even in the existence of highly oscillating malicious behavior. The non-repudiation can be provided by the digital signature, meaning that the signer cannot successfully claim if the message is not signed, but also demanding their private key remains secret. The time stamp for the digital signature is offered by the non-repudiation schemes, even if the private key is exposed and the sign is valid nonetheless.

An agent should use evidence-based review measurements to predict future behavior. This is the essence of a trust system, with an agent rationally assessing other's behavior and acting upon its knowledge. The review measurements should be accurate, precise, and possible to aggregate. The graph based measurement is the key because aggregation enables an agent to communicate about trust and to put together indirect information obtained from other agents to increase knowledge of other agent's trust. The review measurement should be applicable across multiple situations within the same context.

VII. GRAPH BASED RANKING METHOD

Though frequency is efficient for comparator ranking, the frequency-based method can suffer when an input occurs rarely in question collection; for example, suppose the case that all possible comparators to the input are compared only once in questions. In this case, the rate-based method may fail to produce a meaningful ranking result. Then, Represent-ability should also be considered. We regard a comparator representative if it is frequently used as a baseline in the area the user is involved in. For example, if the customer wants to buy a smart phone and he/she considers the models of "Nokia" is the first one he/she wants to compare. That's because "Nokia" is well-known smart phone and it's usually used as a baseline to help users know the performance of other smart phones better.

One possible solution to consider represent-ability can be to use graph-based method such as PageRank. If a comparator is compared to many other important comparators which can be also compared to the input object, so it is considered as a valuable comparator in ranking. Based on this idea, we examine PageRank algorithm to rank comparators for a given input entity which combine frequency and represent-ability.

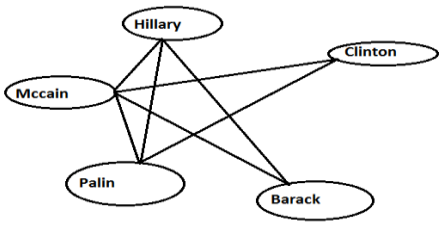

Fig.3. Example graph for user's input Obama

A graph G = (V, E) is defined. In the graph, V is the set of nodes v, which consists of comparable comparators of the input. The edge e_{ij} between v_i and v_j means that the two comparators are compared in our comparator pair repository. Fig. 3: shows one example of a graph for an input entity "Obama". A transaction probability P (v_i /v_j) is defined as follows:

$$P(v_i / v_j) = \text{Count}(v_i / v_j) / \text{Count}(v_j, *), \quad (1)$$

Count (v_i /v_j) is the frequency of comparator pairs v_i and v_j in our repository. For a user input entity e, the PageRank score S (v_i) for node v_i is defined.

$$S^{(k)}(v_i) = \lambda . S^{(0)}(v_i) + (1-\lambda) . \Sigma P(v_i/v_j) . S^{(k-1)}(v_j), \quad (2)$$

Where

$$S^{(0)}(v_i) = \text{Count}(e, v_j)/\text{Count}(e, *), \quad (3)$$

An initial score of each node is initialized as (3) and scores for nodes are iteratively calculated based on (2) until they are converged. In this algorithm, is set as 0.8. The ranking method is called as PageRank-based method.

VIII. EXPERIMENT RESULTS

The form of "X versus Y" queries are extracted from about 13M unique queries and its frequency is more than 10 in the 6 month query log of a commercial web search engine. Then the strings corresponding to "X" and "Y" are extracted and it is regarded as a comparator pair, if its length is more than 3. Then the overlap statistics between comparator pairs from query log are calculated and from CQA questions. The total number of reliable seed pairs from the query log extracted is about 4,200. In the consequences, the comparator archive covers about 64 percent of comparator pairs from query log on the basis of rates , even though the coverage of comparator pairs from query log over the database is only 0.6 percent. The frequency for the queries in query log is more than 100; the database coverage is raised up and about 76 percent. Once considering that there can be lots of noisy comparator pairs from the form of "X vs. Y" . The CQA questions remain rich sources for extraction of comparators are indicated by these numbers. The CQA questions from which comparator pair database built could cover many comparator pairs and it can be mined from query logs.

Comparator ranking goal is to rank equivalent comparators given a user's input unit according to some realistic measures. To determine whether the comparator is good for a user's input entity is not easy due to the subjective nature of comparators. In this effort, just estimate comparator ranking correlation between CQA questions and webpages to authorize that the comparator ranking is biased on CQA questions. The Google search engine using a comparator pair connected by "versus" as search query returns the number of webpages from which the frequency of comparators compared in webpages is obtained. Information is as follows. First, for an input entity Q in every set, then the comparators are ranked in the database with this ranking method. The numbers of webpages returned by Google using phrasal queries are examined.

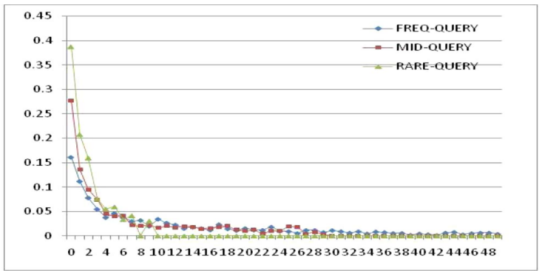

Fig.4.The average number of retrieved webpages changes according to ranks

The rank position of E given a query Q in a query set is indicated by X-axis. The number of webpages regained by phrasal queries containing E also Q is indicated by Y – axis. The phrasal queries containing Q retrieves the total number of webpages and normalizes the values, Q and E are combined with quotation marks. If the interests in comparing E with Q in webpages are more, then there would be many Webpages containing the phrase "Q versus E" or "E versus Q." Fig4. In the ranking results the relation between a rank position of E from CQA questions shows and phrasal queries containing E returns the number of webpages. As revealed in the above fig as the rank of E gets lower than the average number of webpages decreases generally. Precisely, in every query set the number of webpages in top rank areas is much complex than other areas . It proves that the comparison interests in CQA questions are highly interrelated with the webpages.

IX. CONCLUSION

In this paper, a novel trust computation model presented called secured trust for evaluating agents in multi agent environments for best dealer finding process. Secured Trust can ensure safeguarded communication among agents by effectively detecting intentional behaviors of malevolent agents. Then the given inclusive precise definition of the different factors related to computing trust. Simulation results indicate, compared to other existing trust models, Secured-Trust is more robust and effective against attacks from opportunistic malicious agents. The future will be focus on extension of secured-trust into various environments and to be more effective.

REFERENCES

[1] D. Ravichandran and E. Hovy, "Learning Surface Text Patterns for a Question Answering System," *Proc.40th Ann. Meeting on Assoc. for Computational Linguistics (ACL '02),* pp. 41-47, 2002.

[2] R.J. Mooney and R. Bunescu, "Mining Knowledge from Text Using Information Extraction," *ACM SIGKDD Exploration News-letter*, vol. 7, no. 1, pp. 3-10, 2005.

[3] D. Radev, W. Fan, H. Qi, H. Wu, A. Grewal, "Probabilistic Question Answering on the Web," J. Am. Soc. For Information Science and Technology, pp. 408-419, 2002

[4] G. Jeh and J. Widom, "Scaling Personalized Web Search," Proc. 12th Int'l Conf. World Wide Web (WWW '02), pp. 271-279, 2003.

[5] M.E. Califf and R.J. Mooney, "Relational Learning of Pattern-Match Rules for Information Extraction," Proc. 16th Nat'l Conf. Artificial Intelligence and the 11th Innovative Applications of Artificial Intelligence (AAAI '99/IAAI '99), 1999.

[6] Z. Kozareva, E. Riloff, and E. Hovy, "Semantic Class Learning from the Web with Hyponym Pattern Linkage Graphs," *Proc. Ann. Meeting of the Assoc. for Computational Linguistics: Human Language Technologies (ACL-08: HLT)*, pp. 1048-1056, 2008.

[7] N. Jindal and B. Liu, "Identifying Comparative Sentences in TextDocuments," Proc. 29th Ann. Int'l ACM SIGIR Conf. Research and Development in Information Retrieval (SIGIR '06), PP. 244-251, 2006.