Survey on E-negotiation strategies in E-trading

Vasant M.Bhabad¹, Prof. Kore K.S.²

¹ Student of M.E, Computer Engineering, SPCOE, Otur, Dist-Pune, Maharashtra, India. ² Assistance Professor Computer Engineering, SPCOE, Otur, Dist-Pune, Maharashtra, India.

ABSTRACT

E-negotiation plays a vital role in in e-commerce. Its research widely focuses on negotiation strategy and protocol design. There is a more extensive need of further scientific research and enforces on the implementation of various negotiation strategy selection, which is useful to achieve better online negotiation outcomes for both vendor and customer. Such kind of e-negotiation research has not apply to real world problems. This paper addresses survey on various e-negotiation strategies, which is further effectively useful for different real world problem. This paper focuses on negotiating agent system and existing negotiation strategies. We focus on the effectiveness of each negotiation strategies on different real world problems. This e-negotiation survey supports current business practices as well as new ones within Internet .It also helps to improve ability of negotiation for outcomes in e-commerce, using software agent as a e- negotiator. This paper focuses on one to many e-negotiations.

Keyword - E-trade, E-commerce, E-negotiation, One-to-one, One-to-many

1. INTRODUCTION

Negotiation is a communication process within a group of entities (i.e Vendor and Customer) with conflicting interests and preferences in order to reach an agreement or compromise [1]. Online trading becomes more common, a large number of electronic commerce services are being developed, which offer more sophisticated trading environments. Software agent technologies are promising great advantages to the way we do business The online auction [3], is a example of one-to-many negotiation and hence become a part of trading mechanism in the emarket and smart market[4], E-negotiation is an automated process that tries to maximize outcomes of negotiating parties. It facilitates negotiation through the Internet as being free from place and time limitations. It saves negotiators time and effort which they spend in trying to reach common agreement. And tries to resolve conflicts through concessions and search for affordable and acceptable alternatives (Calisti, 2002). It overcomes limitations of human negotiation that suffers from emotional, rational, disdainful, or apprehensive responses (Murugesan, 2000). It also keeps a record of negotiation traces for later verification. Moreover, it allows extensive comparisons between wide varieties of goods or services at the market and results in error-free calculations that promote customer satisfaction and trust in e-Negotiation. E-negotiation can be fully automated through the deployment of software intelligent agents. Agents can autonomously carry out negotiation on behalf of negotiating entities. Agents can be stationary or mobile. Agent-based e-Negotiation has recently received much attention. E-negotiation has significant applications in a broad range of areas including economics, politics, manufacturing, business, commerce, military, etc. Negotiation takes place between individual supply chain partners as regards the different phases of transforming raw material into products to be delivered to the customer. Manufacturers may negotiate with vendors for raw material; wholesalers negotiate with manufactures for manufacturing capacity; manufactures negotiate with logistics channels for distribution; retailers negotiate with logistics channels for delivery services.

Negotiation can be classified based on the number of negotiating entities into three domains: one-to-one, one-to many, or many-to-many negotiation. The three domains are discussed below.

7195

1.1 One-to-one e-Negotiation

One-to-one bilateral negotiation is used in bargaining systems, where agents carry out bilateral negotiations exchanging offers and counter-offers research work. The price-based negotiation is an example where both buyer and vendor try to maximize their own utilities. The client negotiates for the least possible pay and the vendor negotiates for the most possible gain. They have conflicting goals and different client's negotiation deadlines. They have incomplete information about each other and bargaining is under time constraints in terms of client's negotiation deadlines. They have deadlines as private information and the negotiating entity with an earlier deadline has a weak bargaining power. They can jointly reach an agreement that meets their acceptable and most possible utilities. At a bargaining equilibrium, a negotiating entity cannot be better off without causing a drop in the utility of its opponent

1.2 One-to-many e-Negotiation

The one-to-many negotiation has been modeled as multiple threads of negotiation Negotiation threads might act independently or interactively .The negotiation can be bilateral or unilateral. The unilateral negotiation is implemented in auctions such as Vickery, English, and Dutch. The negotiation can be bilateral or unilateral. The unilateral negotiation is implemented in auctions such as Vickery, English, and Dutch. The negotiation can be modeled based on the different approaches. One is simultaneous approach in which Single complex stationary agent would carry out simultaneous one-to-one negotiation threads. Stationary manager agent would assign stationary sub-agents to carry out one-to-one negotiation threads individually. The threads would be carried out concurrently. The manager agent would then control the sub-agents

1.3 Many-to-one e-Negotiation

Many-to-one bilateral multi-constraint negotiation takes place when a group of participants on one side negotiate a deal/contract with one participant on the other side. Each participant in the group may have specific preferences and priorities as regards the negotiation agenda that conflict with others. An example is a couple having interest in home mortgage where the husband is concerned about the first payment and the wife is concerned about the installment plan. They should firstly agree on a negotiation agenda and can negotiate the constraints of concern sequentially or simultaneously with the vendor.

2. Literature review

A negotiation strategy is a decision-making model used by the participants to achieve their purposes [2]. In negotiation, one party cannot control its opponent directly, so each should employ certain strategies to persuade the opponent towards the outcome they desired. The work of [2] proposed two typical strategies: (1) Behaviordependent one is concerned with responsiveness to a partner's behavior, and imitates its behavior in a variety of ways. (2) Time-dependent one completely ignores the reaction of the opponent, i.e. it proposes offers only according to a predetermined time-dependent sequence [2]. Based on these strategies, a negotiating agent can make offers against its opponents complying with a fixed decision function during the course of negotiation. However, to be more successful, an agent needs to adapt to the behavior of its partners and changing environment. Accordingly, effective mechanism should allow a negotiating agent to learn from the previous offers of its negotiating partner in order to predict the partner's future behavior and adapt to it [3]. Much work has been done to equip the agents with the capability of predicting their opponents' negotiation behavior (e.g., price offer, reservation price, and negotiation deadline prediction) by learning from previous negotiations, so that they can achieve more profitable results and better resource utilization. For example, a negotiation model is equipped with feed forward artificial neural network and thus can forecast the opponent's next price proposal according to its past three price proposals. This prediction is very effective and relatively accurate when the curve of the price proposal is regular and smooth. Yet when being near to the inflection point of the curve, the prediction would be increasingly hard and unreliable. In essence as shown in Fig. 1, the area near the inflection point is the critical place of the negotiation. In addition, in a humancomputer negotiation context, predicting human's behavior could be even more difficult because the human's offers do not comply with a fixed offer function. In theory, negotiating agents are designed to imitate human being's thinking to negotiate autonomously. However, human negotiators usually perform a behavioral game process, rather than surmising the opponent's next offer in real world negotiations. Normally it is required to observe the opponent's behavior, including offers, words, actions, and so on, to collect enough information before making the next decision. During this process, imitating the opponent's negotiation behavior is the most conventional method, just as pointed

out. In essence, we consider that an intelligent method for the agent to enhance its capability of learning is not to solely predict the opponent's behavior, but to quickly adjust its offer strategy according to the opponent's changing proposals. This lays the theoretical foundation for the multi-strategy selection .Following fig shows e-negotiation agent architecture.





2.1 The multi-constraint selection model

The simplest negotiation model is a bilateral negotiation with a single attribute. In most cases, however, the negotiators have to process several attributes of the product at the same time [1,2]. Before making concession, the negotiator should try to trade off among the different attributes, when they cannot trade off a satisfied result, they might concede according to the predefined concession strategies, evolving to a similar process with the single attribute negotiation. In this multi-constraint negotiation the conditions are taken as input for negotiation, The multiple conditions are given example suppose client want to purchase a car then the attributes given are color, number of airbags, price, model, delivery date, mileage, fuel type etc. These multi-constraint negotiation is better suited for today's e-trading, the vendor agent first collects the request from the customer on the behalf of client agent. Then negotiation round starts. Three ways of negotiation of multiple issues one is Package deal: This issue links all the issues and discusses them together as bundle. Second is Simultaneous negotiation: Simultaneous involves settling the issues in rounds or in iterations sequentially, one after another. These three different procedures have different properties and gains different outcomes to the negotiators.



Fig -2 Multi-constraint negotiation Model for Car.

2.2 Agent Technologies for E-Commerce-

Most of the technologies in recent agent-based e-commerce systems from Artificial Intelligence (AI) research. From extracting meaning from Web pages to planning trips to Hawaii, from learning users' music preferences to negotiating delivery contracts and deciding on which car to buy [2], AI technologies will continue to provide software agents with increased knowledge how to successfully mediate e- commerce goal. This paper reviews several technologies of AI that support the systems next-generation agent mediated electronic commerce infrastructure.

2.2.3 Recommender Systems

The majority of share of item recommender frameworks are produced utilizing content-based, cooperative based or requirement based sifting techniques as their fundamental technology. In content-based separating the framework forms data from different sources and tries to remove valuable highlights and components about its substance. The systems utilized as a part of substance based separating can differ enormously in many-sided quality. Catchphrase based inquiry is one of the least difficult systems that includes coordinating diverse mixes of watchwords (some of the time in boolean shape). A further developed type of separating is the one in light of removing semantic data from a report's substance. This can be accomplished by utilizing methods like acquainted systems of watchwords in a sentence or value list, or coordinated charts of words that frame sentences, Frameworks like Bargain Finder and Jango attempt to gather data (e.g., item portrayals, prices, reviews, and so on.) from a wide range of Web data sources. These sources were proposed to be perused by people and their substance is rendered as needs be (i.e.,in HTML). Diverse sources have distinctive information sources (e.g., CGI-contents, Java applets) and introduction techniques, so recommender frameworks need to change their association strategies relying on the Web webpage. Since there is no standard method for characterizing and getting to shipper offerings, most recommender frameworks utilize "wrappers" to change the data from a particular Web webpage into a locally basic configuration. Diverse frameworks take after substitute ways to deal with making wrappers. In Bargain Finder, the Internet areas of on-line CD stores and the techniques to get to them (i.e., hunting down an item and getting its cost) are hand-coded by Andersen Consulting software engineers. This technique functioned admirably toward the start yet is difficult to scale since it includes keeping up the wrapper for each site at whatever point it changes its entrance strategies or list introduction arrange. Jango robotizes the making of wrappers for new destinations by summing up from illustration inquiry reactions to online trader databases. This system isn't immaculate, however gloats an about half achievement rate in exploring arbitrary Web assets [4]. Firefly utilizes a community based sifting innovation to prescribe items to buyers. Frameworks utilizing community methods utilize criticism and appraisals from various customers to sift through insignificant data. These frameworks don't endeavor to examine or then again "comprehend" the highlights or the depictions of the items. Or maybe, they utilize shoppers' rankings to create an "agreeability" file for every item. This record is not worldwide, but rather is measurably processed for every client

on the fly by utilizing the profiles of different clients with similar interests. Items that are preferred by comparable

Dis-approved of individuals will have need over items that are loathed. As in content-based methodologies, requirement based filtering utilizes highlights of things to decide their relevance. Be that as it may, not at all like most element based methods which get to information in their local organizations, imperative based procedures require that the issue and arrangement space be planned regarding factors, spaces, and imperatives.

2.2.3 User Interface Approaches

Traditional electronic shopping depending upon the necessities of the purchaser and nature of the item offerings. For example, here and there a customer is simply perusing without a particular aim to purchase or here and there the customer means to purchase yet is unfamiliar with the highlights of the particular item classification (e.g., "I simply require a camcorder whose tapes are compatible with my VCR."). Different circumstances, the customer means to purchase and has a profound comprehension of the item class (e.g., "I require a S-VHS camcorder with x16 optical zoom.") Matching the framework's UI with the purchaser's way of shopping will probably result in more prominent consumer loyalty. The UI that most frameworks offer today is an "electronic index" which takes after an upgraded value list with look abilities. Lamentably, these accessible records still make it difficult for customers to connect an item with their particular needs and bear less captivating shopping encounters than their physical-store partners. One way to deal with help beat these issues is the on-line emulating of well-known physical-world shopping components. For instance, 3D VRML shopping shopping centers have been produced to give a more natural shopping setting. Albeit promising , these shopping conditions have not yet satisfied their desires because of the ponderousness of exploring 3D universes with 2D interfaces and other specialized limita- tions (e.g., data transmission).

Another case is the presentation of offers agent symbols – semi-vivified graphical characters that connect in characteristic dialect with the shopper and highlight a long haul predictable "identity" that recalls every client, his or her shopping propensities, and so forth. Humanized symbols (e.g., from Extempo endeavor to impersonate certifiable deals agents to master vide an all the more captivating on-line shopping knowledge furthermore, help clients in finding the items that best address their issues. Through quick positive sustain back and customized consideration, humanized deals agents can help manufacture drawing in, confided in connection ships with clients . Be that as it may, the AI technologies behind the graphical portrayals of the present symbols are not yet up to meeting their clients' expectations. Because of this and different reasons, the trust of agents is as yet a disputable approach The issue of trust is critical in any agent system, particularly when cash is included. A vital issue in creating trust in agent frameworks is the capacity of an agent to show to some degree unsurprising conduct what's more, to give a clarification to its activities. For occasion, a buyer can take after the choice procedure of an imperative fulfillment framework like PersonaLogic substantially less demanding than that of a community oriented sifting system like Firefly which constructs its suggestions with respect to "undetectable" groups of similar individuals.

In respects to multifaceted nature and consistency of practices, preliminary tests with the Kasbah framework demonstrated that buyers favored basic, unsurprising agents with pre-decided negotiation strategies over "more brilliant" agents that constantly adjusted their conduct contingent upon an examination of the commercial center. It is protected to declare that, as with any product framework, agents that intercede electronic commerce exchanges can extraordinarily profit by all around outlined and very much tried.

2.2.4 Negotiation Mechanisms

Mechanisms of a negotiation involve the substantial activities of the diversion. A case of a basic negotiation is the Dutch sale where the main legitimate offering activity is an open clamor of "mine!" (or equivalent) as a barker decrements the cost of the good(i.e., an arrangement of activity) to expand his or her utility. Choice examination instruments help distinguish ideal strategies given a bidder's inclinations and learning (e.g., inspiration, valuation, hazard, data asymmetry, and so forth.). While financial matters inquire about frequently concentrates on partial and general harmony parts of market-based negotiation, amusement hypothesis investigate tends to concentrate on recognizing ideal (self-intrigued) strategies and predicting results for an assortment of negotiation conventions . A key thought from both of these exploration regions is that the determination of the convention will have substantial, undulating impacts on the idea of the general framework . As such, convention outline in the CBB Negotiation phase of agent-interceded electronic commerce to be thought about precisely. The examination region that unions negotiation with delicate product agents is the expansive field of Multi-Agent Systems (MAS) which discovers its underlying foundations in Distributed Artificial Knowledge (DAI). Early DAI work displayed negotiation as Distributed Problem Solving and expected a high level of participation among agents keeping in mind the end goal

to mutually accomplish a shared objective. For instance, the Persuader middle person framework joined multi characteristic utility and case-based thinking to recognize a commonly ideal arrangement amid work connection negotiations. Later MAS work in damage ket-based frameworks (e.g., AuctionBot[3]), on the other hand, accept add up to self-intrigue and a high level of rivalry among agents amid negotiations for limited assets. A great part of the work in agent-interceded negotiations can be followed back to the Contract Net. The first Contract Net was a circulated critical thinking system intended for artful, versatile undertaking allocation with agents declaring undertakings, setting offers, and granting contracts. Impediments of the first Contract Net Protocol (CNP) have been tended to in additional late work by Sandholm and Lesser . Related work incorporates Malone, et al's. Enterprise framework which apportions PC undertakings utilizing negotiation instruments and conventions for automated coalition development among agents. These latter conventions permit self-intrigued agents to collaborate on undertakings (e.g., use economies of scale) without a priori connections among their proprietors.

3. PROPOSED WORK

In the proposed system, we are going to design a centralized negotiation search engine, which will provide capability of e-negotiatin between Vendor and client through e-commerce site, without any human interference on seller's side. Web services will be used which can be called by a e-commerce site to check if the price which customer entered is ok based on their constraints to make the deal or some negotiation required, if negotiation is required it will respond with "Reject-With-Re-Negotiate(Next-iteration)" and if shopper has exhausted the number of attempts available to him, it will respond with "Reject". The key difference in proposed approach and pervious approaches is that not only the product behavior and market conditions are taken into consideration previously but here the customer's past and current behavior will also play an important role in deciding the bargaining strategy. The proposed system will consist of different modules. In this system data about the product sales, product value with region and time deadlines and customer behaviour history is very important. The data collection will be done through "Data Collection Module". The sequence of rounds in "Integration Module" will integrate the different systems to collect the required data. The "Processing Module" will process the requests from clients to determine the negotiation strategy. Following will be the steps involved in e-negotiation:

1 .Initially current maximum price of that particular product set by the seller will be offered to the customer.

2. Customer starts negotiating by entering the initial price which is lower than price offered by seller.

3. System Analyses MIN and MAX limit based on following factors.

a. Negotiation history of the product Category

b. Negotiation history of the product group.

c. Negotiation history of the product.

d. Negotiating behaviour of customer, derived from customer bargaining pattern from past purchases.

e. Negotiating behaviour of customer, derived from customer bargaining pattern from current ongoing

negotiation.

f. Timelines, Product life cycle, Popularity.

4. Once MIN-MAX is determined, the customer willingness to pay (WTP) is determined.

5. If the price which customer is demanding if falling towards/below MIN range determined above, then system will reject the negotiation and ask customer to try again, except otherwise.

a. Though customer price fall in range but rejection made in initial attempts just to tempt customer so that he can enter price greater than initial attempt.

6. Customer again enters a new price which is greater than earlier.

7. Once again step 3

6. are repeated, and system accepts/rejects the deal.

a. Deals towards MIN are also accepted if system finds that customer is not going to pay more and no other customer is going to pay more. This again depends on many factors.

4. CONCLUSIONS

The agent based e-commerce systems are already creating new markets (e.g., low cost customer-to-vendor and refurbished goods) and it used to reduce transaction costs. By making smart agent based negotiation system. The several task are reducing. The todays Software Agent technologies mature to better manage different conflicting content, preferences, complex requirements, changing environments, and different entities. The more changes may occur, once standards are used and evolved to non-conflicting and internationally define products and services, client and vendor profiles, add on services, secure payment mechanisms through trusted server. During this next-

generation of agent based e-commerce, vendor will enhance customer satisfaction and focus on business-tobusiness transactions, reducing costs of transaction at every stage of the cycle (supply chain). In some cases new types of electronic transaction will emerges in the form of relationships among previously unknown entities. The trading competition leads to provide goods or services to customer in affordable cost. The conclusion leads to form a new one to many bilateral negotiation framework. This is reduces time by implementing for simultaneous for many one-to-e-negotiation.

5. ACKNOWLEDGEMENT

I dedicate all my works to my esteemed guide Prof. Kore K.S., whose interest and guidance helped me to complete the work successfully. This experience will always steer me to do my work perfectly and professionally. I express my immense pleasure and thankfulness to all the teachers and staff of the Department of Computer Engineering, for their co-operation and support. Last but not the least, I thank all others, and especially my friends who in one way or another helped me in the successful completion of this paper

6. REFERENCES

[1]. S. Son and K.M. Sim, A price-timeslot negotiation for cloud service reservation, IEEE Trans. Syst. Man Cybernet. B 42(3), pp.713–728, 2012.

[2]. S. Fatima, S. Kraus, and M., Wooldridge, The negotiation game, Intelligent Systems, IEEE, Volume: 29 (5), pp.57–61, 2014.

[3]. Y. Zhuang, S. Fong and M. Shi, "Knowledge-empowered automated negotiation for e-commerce," Knowl. Info. Syst., 17 (2), pp.167–191, 2008.

[4]. J. Collins, W. Ketter, M. Gini and B. Mobasher, "A multi-agent negotiation testbed for contracting tasks with temporal and precedence constraints," Electron. Commer., vol. 7, no. 1, pp. 35–57, 2002.

