Mobile-Delegate Based Approach for Utilization of Top Offers to Improve E-Trading

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Abstract
Buyers and sellers nowadays depend on electronic media for business activities to perform electronic trading. Electronic trading (e-trading) gives virtual place for marketing instead of existing physical place. The major critical task involved in e-trading is negotiating on the business made. In negotiation the key problem is most of the top utility offers offered by the industries will be missed before it is properly utilized by the buyers and sellers. In this concern, we propose a mobile delegate based approach for utilization of top offers to improve e-trading. Proposed approach uses mobile delegates to exchange information in negotiation between the client agents. These provide secure transmission of information and gives efficient mechanism to utilise offers.
Keywords: Negotiation strategy, limited offers, top offers, mobile-delegates, security.

1. INTRODUCTION

E-commerce is defined as, "the use of electronic transmission medium (telecommunication to engage in exchange, including buying and selling of products and services requiring transportation, either physically or digitally, from location to location." E-commerce is beneficial for several reasons. For example, it provides convenient access to products that may otherwise not be accessible, which is Ecommerce relates to buying and selling of information, products and services via computer networks, i.e. it is a means of transacting business electronically through Internet. In other words, it is a means of conducting business or trading or marketing online. Most of the transactions, since beginning of internet were online consumer shopping on the web [1].

Electronic trading (e-trading) is conducting stock transactions on the internet via several websites. Such businesses have a great role in emerging trends and online business has a great impact over many financial services consists of check writing, credit and debit cards, electronic bill paying. In

recent years electronic and trading automatically has emerged as crucial part of current business in markets [2]. Because of the technology development, the business world encountered new possibilities to exchange data by computer networks at reduced costs. So, computer based networking has created major changes in business activity. Therefore, these changes need a fundamental rethinking of the development of negotiation models. Creating and developing intelligent autonomous agents is an important issue nowadays. The agents could have different goals, constraints, capabilities and preferences. Negotiation between agents becomes a complex problem to be solved.

Negotiation represents the process aimed to change the plans, in order to reach an agreement among a subset of businesses. In other words, negotiation is a form of decision making, where two or more agents search together a space of possible solutions through interaction, with the goal of reaching a consensus.

Negotiation usually has a series of rounds, with every agent making a proposal at each round. Negotiation is a process that appears in many aspects of our lives. Research in the field of automated negotiation has suggested the design and use of automated negotiators, on one hand to allow facilitation of the negotiation process by human negotiators and, on the other hand, to provide automated agents that can negotiate on behalf of humans.

The negotiation process appears in all electronic transactions at the time of the communication of agents in order to reach mutual beneficial agreements. The agents might have some common interest in cooperating, but might have some conflicting issues about how to cooperate, as shown in Figure.
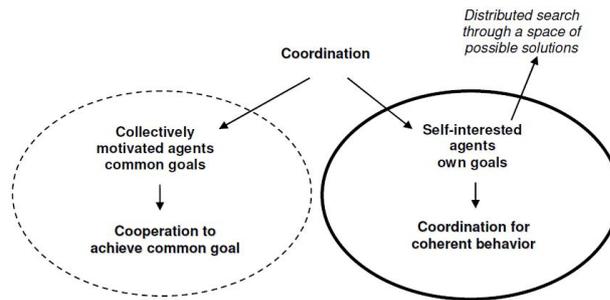
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Figure1: Co ordination in negotiation [3]

In a telecommunications market, a software agent, representing the user and running on a smart phone, negotiates with other software agents representing phone companies. This is presented in Figure 2(a). In dynamic supply chains, a software agent acting on behalf of a computer manufacturer negotiates with various supplier agents, in order to assure the delivery of various components. Each supplier agent might itself negotiate with subcontractors to get the components it needs. This is presented in Figure 2(b).
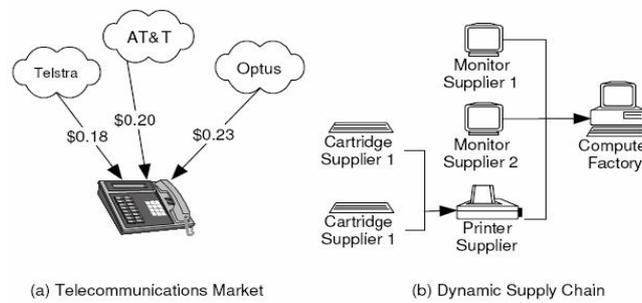

Figure2: Automated Negotiation Scenarios [4]

This paper is framed as follows: Section II discusses about related work. In section III, the key challenges are highlighted. In section IV, methodology proposed is represented and mobile-delegate based model is discussed. In section V, gives the shows results and snapshots obtained in this work. Conclusion is presented in section VI.

2. RELATED WORK

There are many research work have been carried out in field of e-trading negotiation models. An *et al.* [5] addressed one-to-many bilateral negotiation strategy where the agents carry out negotiation threads simultaneously and generate counter-offers after a fixed waiting time or a fixed number of received offers without the need to wait for all offers to be received from vendors. The approach in [6] converts the one-to-many negotiation to concurrent one-to-one negotiations. The authors did not consider offer validity time. Louta*et al.* [7] addressed one-to-many negotiation and proposed a negotiation strategy that deploys mobile agents and carries out negotiation threads sequentially. The strategy is based on offers ranking rather than counter-offer generation. The authors assumed incomplete information about vendors' negotiation deadlines. Collins *et al.* [8] addressed one-to-many negotiation and identified the risk of awarding the bid to an early offer with a considerably high price when the bidding task is critical. The authors did not propose any approach to manage the risk. He & Leung [9] proposed approaches for enhancing trust in e-Transaction including: enforcement of third parties, chunking e-Negotiation transactions into smaller chunks, and enforcement of social laws. The approaches do not address the security properties of data exchanged during e-Negotiation. Yang [10] proposed security protocols that protect data the agent collects and agent itinerary based on onion routing scheme. The protocols ensure integrity of agent itinerary, anonymity of non-neighbor hosts in the agent itinerary, and fault-tolerance of remote hosts. They also ensure forward integrity, privacy, and non-reputability properties of collected data. The protocols only address security of one-to-one e-Negotiation and do not address authenticity of collected data. Also, they require complex calculations that affect their functionality. Mobach [11] introduced Kernel layer into system architecture that secures agent communication, migration and execution. The approach does not address authenticity and non-repudiation properties and assumes agents execute at trusted hosts. Also, the approach does not clearly describe encryption mechanisms for privacy and integrity of agent's data.

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3. KEY CHALLENGES

The key challenges in e-trading are as follows:

- **Space of Possible Deals** - this represents a finite set of candidate deals for the agents to consider. Possible proposals that the agents can make are restricted by this set
- **Negotiation Process** - this is a negotiation protocol, which, given the set of possible deals, defines how the agents will find to an agreement on a single deal. It specifies the set of rules that govern the agent interactions, while they attempt to reach a consensus. The process explicitly defines the various negotiation states, the events that cause negotiation states to change, and the valid actions for the agents in particular states. The negotiation process also defines the rules that determine when a deal is obtained, and what this agreement deal is
- **Negotiation Strategy** - given a set of possible deals and a negotiation process, a negotiation strategy represents a model that individual agents employ to make decisions and achieve their objectives

4. PROPOSED APPROACH

The proposed approach composed of various steps:

- **User interaction:** buyers can view the product details and then views all details about the vendor agent as well as know about the product offers then only user going to buy the product from vendor.
- **Vendor agent:** Each vendor maintains a vendor Agent (VA) that acts on behalf of a vendor and negotiates with client agents. The VA agent advertises vendor's goods/services. This information is maintained in the catalog at the e-marketplace and accessible and visible to all clients through a trusted CA agent.
- **Offer collection:** A negotiation strategy is a decision-making process employed by the trading partners to maximize their gains and reach a consensus on the terms of trading such as prices, delivery dates, and payment terms.
- **Mobile-delegate:** The client and vendor agents negotiate through exchanging offers. An offer fi from an entity i is defined as:

$$fi = \langle vid, X, TSV, TEV, RFOk \rangle$$

Where vid is the unique identifier of the vendor generating offer fi, X is the values of the offer attributes, TSV is the offer start time validity and TEV is the offer end time validity. The parameter $RFOk$ denotes the request for offer from client k. The work flow of the proposed approach is as shown in figure 3.

The information exchange scheme applied by the mobile delegates is described as follows:

- When seller agents are initialized, they inform the vendors which products they sell. The products are registered by an alias used both by buyers and sellers
- The buyer agent (B) uses mobile-delegates to find which agents are selling the first product on its list of products to buy
- If there are no agents selling product P1 then B tries to find the agents which sell product P2 and so on.
- Secure one-to-many e-negotiation strategy with emphases on offers with specific expiry deadline.
- In e-trade, vendors often announce special offers with public expiry deadlines. The top utility offer has a fixed validity time that cannot be negotiated and may be earlier than the client's negotiation deadline.
- In this case, the offer would expire before the negotiation is completed and hence the top utility offer would be missed out, which is composed of several rounds where the client and vendor agents exchange offers in an alternating way.
- Duplicate offers are not allowed during negotiation. This is handled by using a unique nonce that identifies the protocol run.
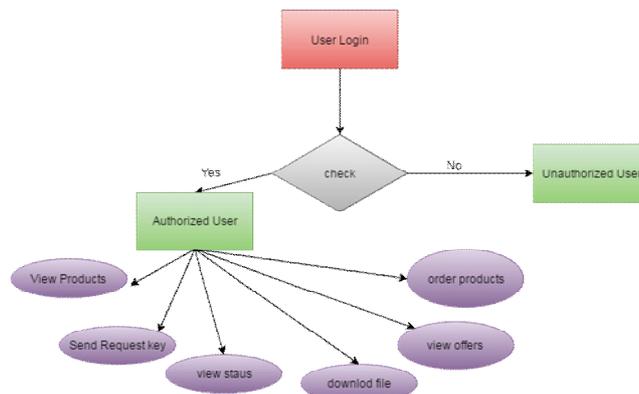

Figure 3: Work flow the proposed apprach

5. RESULTS

The proposed approach has been implemented in Php which will support e-trading for business. For the backend mysql is used. The implemented web application is deployed in xamp server for testing the web application. The figure 4 shows the screenshot of the adding product details to sell. Figure 5 shows the screenshot of updating the product details to sell. Figure 6 shows the buyers order for product to buy.
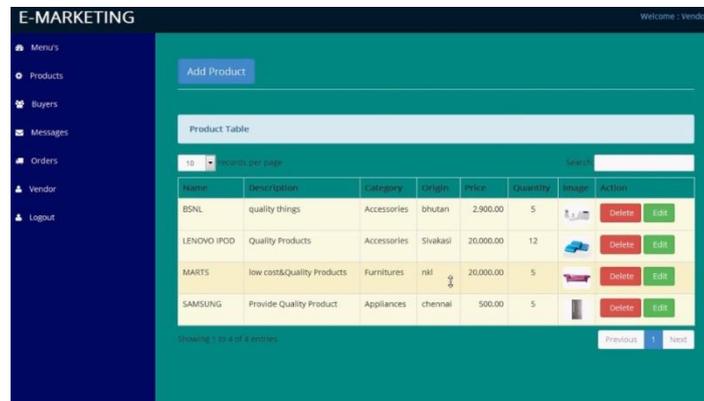
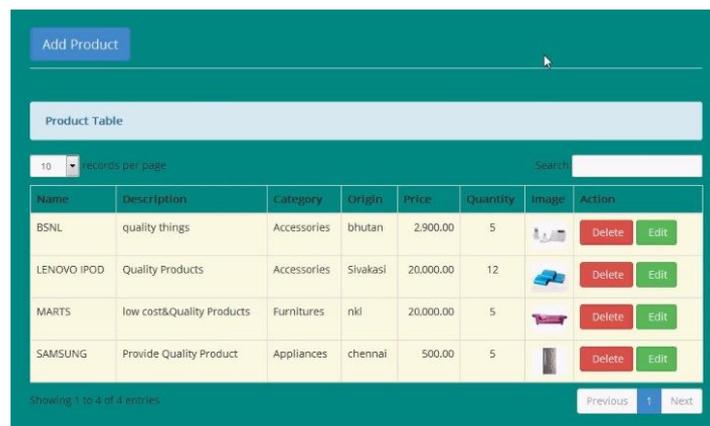**Figure 4:** sellers screen shot of adding product details to sell.

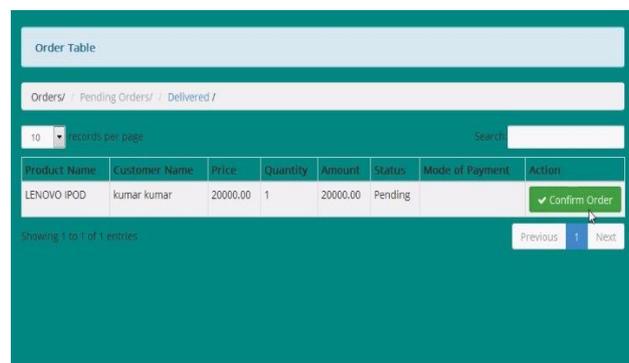**Figure 5:** sellers screen shot of updated product details to sell

Figure 6: buyers order for product to buy.

6. CONCLUSION

The stock business of e-trading business have been increasing since its existence in India, at the start it has an gradual improve but later on it has have expanded a lot much and even market share of online traders is increasing. The proposed mobile-delegate based approach present in this work gives the negotiation mechanism which reduces the missing out of top offers before it get expires. From this clients can achieve high profit. Proper authentication is included which preserves privacy and security properties of negotiation data.

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