

Survey on Negotiation Aspects in E commerce

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Abstract:

In this present era of e-commerce, business agreements and disagreements are infeasible without any negotiations. Such negotiations are a major concern of business deals. Numerous research works have been found so far in this zone. Different novel methods have been introduced to improve the negotiation process. In this paper, we have given a survey of such important techniques and approaches of negotiations in e-commerce communication.

Keywords: negotiation, e commerce, bilateral, agent, automated.

Introduction

Arrangement has become a significant theme in the web based business (Zlatko and et. al., 2004). Customary business bargains are regularly made through some sort of arrangements. In the previous years, dealings were human-based. They were completed by the delegates of organizations through eye to eye discourses or by utilizing other wellspring of correspondence media like email, fax, phone (Shamimabi Paurobally and et. al., 2003) (Shamimabi Paurobally and et. al., 2003), or a mix of these. Human-based dealings can be expensive, extensive, and blunder inclined. It would be progressively important if a section or the entirety of the exchange errand could be done consequently over the Web as a piece of e-business exercises. This investigation looks at the current status of arrangement parameter in online business and audits the accessible writing on exchange in Internet business appropriation and advances open doors for future research. The examination may fill in as a significant job for further research in the zone of arrangement.

Related work

Automated Negotiation

Automated negotiation was introduced by the authors (LOMUSCIO and et. al., 2003) Authors have also discussed the parameters and the classification of the negotiation. They have demonstrated cardinality of the exchange, specialist attributes, condition and products qualities, occasion parameters, data parameters and allotment parameters. The classification of negotiation also has been done in the following way.

- One-to-one negotiation in cooperative domains
- Many-to-many negotiation in cooperative domains
- Multi-agent negotiation under time constraints

- One-to-one negotiation in mixed domains
- Argumentation-based negotiation
- Persuasive negotiation

Automated negotiation can also be analysed by decision making model as shown in (Mu-kun Cao, 2011). The research work described here emphasis on independent decision process of agents, abstract model for automated negotiation which contains three sub-concept models as negotiation environment, negotiation process and negotiating agent.

Another computerized exchange situated work has been found in (V. Tamma and et. al., 2005). The creators have utilized semantic web innovation. In this methodology operators arrange paying little heed to the exchange component being used with an almost no earlier information on the convention. Conventions are not hardcoded in the operators taking part to exchange, yet are communicated as far as a mutual cosmology. This philosophy goes about as a general structure that grants specialists to agree. This mutual cosmology idea in the creators work makes it simpler to look at the changed exchange conventions and along these lines accelerating the concession to a solitary convention.

Bilateral and Multilateral Negotiation

Another model called Bilateral negotiation was discussed by (Angela and Carles, 2003). They have introduced an agent architecture for joint action negotiation and it is based on a graded Believes, Desires and Intentions (BDI) model and on an information based negotiation model. The engineering structured uniquely for such situations where a few self-intrigued operators contend occasionally performing activities in explicit time moments. The proposed architecture by the authors is shown below in the figure no. 1.

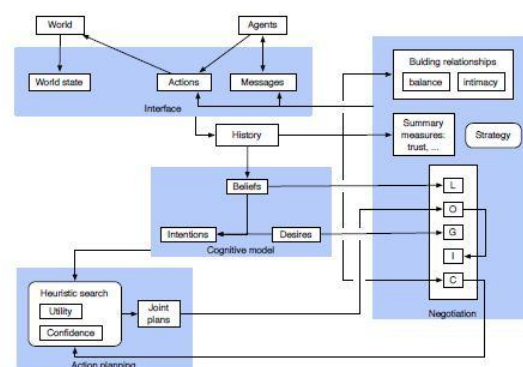


Fig 1: Agent architecture. White boxes represent data or concepts, boxes with round corners represent processes and arrows represent data flows. (Angela and Carles, 2003)

Bilateral negotiation can also work with incomplete information using bounded rational agents as shown in (Raz Lin and et. al., 2006). The automated agent suggested by the authors incorporated a qualitative decision making system which takes into account the agents utility functions and the believed type of the opponent. This helps to take a decision whether to accept or reject an offer and for generating an offer.

Another type of bilateral negotiation called as sequential bilateral negotiation (SBN) has been shown in (Pinho and et. al., 2004). SBN also helps to implement a multi bilateral negotiation (MBN). In SBN the separation between the agreement and deal is done to allow the buyer to continue negotiation with the subsequent seller agents with the help of commitment. This makes SBN different from simple bilateral negotiation and MBN.

The merged concept of automated negotiation and bilateral negotiation has been seen in the research work (Angela, 2012). Simultaneous, repeated and bilateral negotiations in competitive multiagent environments has been addressed in this work. This combined architecture has been shown in figure 2, which is an extension of the architecture shown in figure 1.

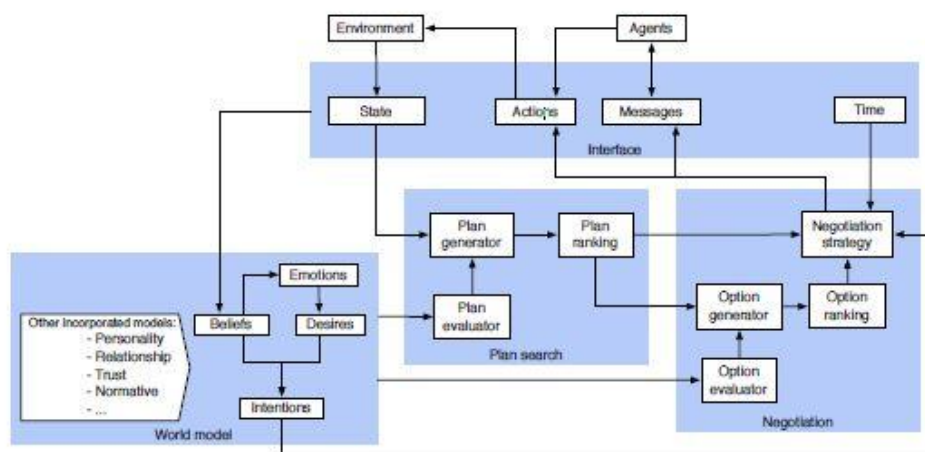


Fig 2: COMBINE architecture. Arrows represent data flows. Coloured boxes represent modules and white boxes are components of those modules. (Angela,2013)

As per the creator, the design gives an interface module that arranges Join operators in their condition, that is, it likewise enables them to watch the earth state, watch and furthermore execute activities. It trade messages with different specialists. At the end of the day, this module contains the sensors and actuators of the operator. Exchange module will choose the execution and sending of message. They have likewise talked about how this design is unique in relation to others dependent on the accompanying number of attributes.

It can work with uncertainty, using a world model based on a graded BDI.
It also includes emotions and trust.
It is adaptable in any environment.
It is proactive by proposing deals considering intentions and set of plans and options.
Negotiation goes simultaneously with searching of plans.
New commitments reduce the search space and new found plans change the negotiation process.

Similar combine negotiation in e commerce has also been shown in (Morad and et. al., 2001). The authors have introduced a novel Combined Negotiation Support System (CNSS) named as CONSENSUS. This enables the users to control and monitor the progress of negotiations and verifies the assurance of different dependencies and user define strategy rules. Along with the workflow technology, negotiating software agents and rule engine technology, the originality of this CONSENSUS lies in the user prospective where they can model the combine negotiation at run time using a work flow. This workflow technology can also be used in combined negotiation process as mentioned in (Bassil and et. al., 2002).

Multiagent concept can also be a solution for extensible negotiation as shown in (Samir AKNINE, 2014). This recent work in negotiation domain differ from others where such negotiation allows the agents to dynamically extend the set of items under negotiation. The model of this extensible negotiation has some distinguished properties such as negotiation of dynamic change of items during a negotiation process along with their constraints and dependencies, synchronized behaviour of the agents, strategic behaviour needed for choosing among several alternatives of the negotiation. These properties have also led the authors to define the assumptions of the negotiation protocols as: information symmetry, completeness of the information, limited duration for the negotiation and penalization of the agents and equity between agents.

The concept of concession making plays an important role in multi bilateral negotiations as the research work (Kersten and Gimon, 2012) says. The authors have proposed for two dimensional typology of concession and their experimental study shows that the bidders and negotiators use all types of permissible concession, which are greater in auctions than in negotiations.

Similar bilateral negotiation was shown in the research work (Chhaya Mudgal and Julita Vassileva, 2000) previously with a different concept of Decision-Theoretic Approach. The authors have worked on personal agents which gives a better response in a dynamic environment. This model also deals with the opponents reaction to provide a better move from the agents who are having neither prior knowledge about the dynamics of the environment nor the opponents strategy.

Another type of negotiation called as multilateral negotiation is also very useful in electronic commerce which provides efficient strategy building. A dynamic

multilateral negotiation model has been introduced by (Louta and et. al., 2004). In this model they have worked on e-commerce context to create efficient negotiation strategies based on ranking mechanism. The strategies created can also be used to extend the functionality of autonomous agents to provide an optimal utility. The framework shown by the authors deals with both contract and decision issues. Similarly the participation of autonomous agents in price negotiation has been researched by (Marcin and Maria, 2007).

Bilateral negotiation decision can also be used for uncertain dynamic outside options which effect the reservation price. Such a theory has been seen in the research work previously (Li and et. al., 2004). The proposed model was composed of three modules single-threaded negotiations, synchronized multi-threaded negotiations, and dynamic multi-threaded negotiations. The model of negotiation follow an alternating-offers protocol in which proposed and respond is done alternatively until and unless some predefined condition has been satisfied. A nested view of the model has been shown by the authors as in figure 3.

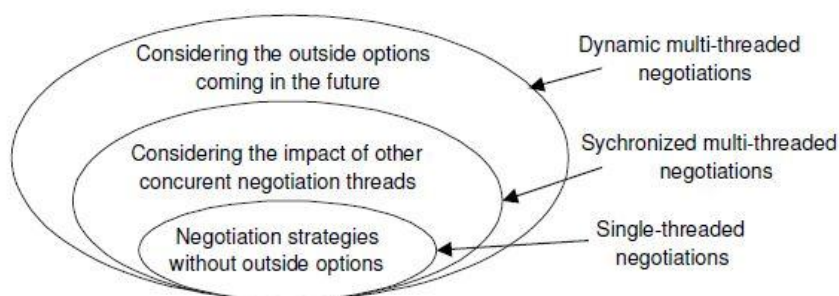


Fig 3: A nested view of the proposed model by Li and et. al., 2004.

A novel strategy Transfer between Negotiation Tasks (TNT) for automated bilateral negotiation with multiple issues has been shown in (Siqu Chen and et. al., 2012). This TNT is capable to transfer probabilistically between negotiation tasks in order to create a bias for the target agents learning behaviour. Such transfer learning leverages the usage of information in a source task to help learning process at the target. This ultimately gains an overall performance. Therefore this novel strategy proves its own advantages firmly.

Negotiation with dynamic module

Another concept of negotiation based upon dynamic loading of negotiation modules has been shown in (Ganzha and et. al., 2001). The authors have given a proposal for the design of negotiating agents as shown in figure 4 below:

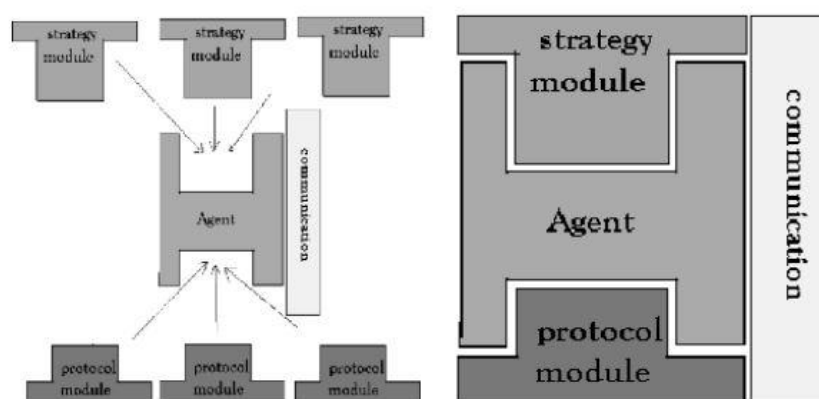


Fig 4: Agents consisting of downloadable models

The architecture is based upon JADE framework. The authors have explained the concepts of client agent(CA), shop agent(SA), client information centre agent(CIC), and client information database agent(CICDB) on the basis of distributed market place environment.

Another JADE framework based system for automated agent negotiation is seen in (Thomas and et. al., 2005) with a different aspect of Defeasible Logic-Based Strategies. The negotiation strategies used in this approach are expressed in a declarative rules language, defeasible logic and are applied thoroughly.

Artificial Intelligence in Negotiation

An ongoing work in this area has been sent in regards to the choice of arrangement convention (Lang and Fink, 2014). Various work has been seen for convention plan of exchange. Or maybe the determination of such convention is as yet befuddling. In this exploration work the creators have demonstrated a choice emotionally supportive network for such exchange convention determination dependent on counterfeit neural network(ANN). The prime thought of the proposed framework is to exploit the successive recursion of events in operational arranging exchange. As per the creators, an exchange happens utilizing a self-assertive convention after which data is store in an archive. Such storehouse contains the assessment of the convention by the operators and furthermore the auxiliary data of that arrangement. The fake neural system will take in designs from the notable information put away in the storehouse. In the wake of learning the ANN, will be proficient to make forecast for an arrangement that isn't begun at this point. The convention choice can be bolstered by this forecast as it speaks to a trust factor about the normal execution of a convention.

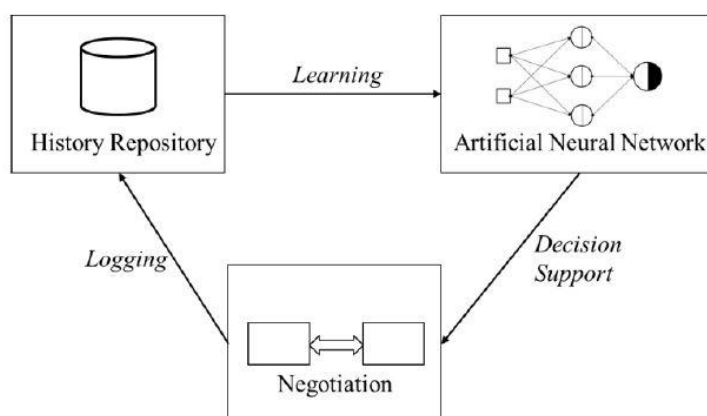


Fig 5 : Setup of the decision support system for negotiation protocol selection []

Another artificial intelligence oriented solution for automatic negotiation is seen in (R. Manjavacas and J.J. Castro-Schez, 2005). The design of this negotiation framework has been suggested on fuzzy repertory table technique (FRT) which helps in analysis of multi options provided for sellers and gains relevant information about each option. The FRT is based on the repertory grid technique for searching issues. It also can be same as an improvement that uses fuzzy logic as formalism of knowledge representation specifically the trapezoidal function.

Others

A novel architecture and framework for internet based deal maker for e business (I DEAL) has been also researched (Hammer and et. al., 2000). The frame work deals with negotiation protocol and automated negotiations among multiple I DEAL servers. The main components of I DEAL are a constraint satisfaction processor, an event-trigger-rule server for managing and triggering the execution of rules which deals with the negotiation strategies. Another design and implementation of a replicable internet based negotiation servers is found in (Su and et. al., 2001).

E commerce does not deal only with inexpensive and standardized products, complex and valuable goods are also get a flow in the market network. Once valuable goods are concerned, the language-action-perspective (LAP) researched by (Mareike Schoop, 2005) provides a novel concept in analysis and modelling of communication acts through negotiation. The negotiation phase is the most promising phase where the maximum communication is done for a business transaction. An efficient support of electronic negotiations can lead to a assured communication process of high quality. LAP is therefore will be relevant for supporting such negotiations.

The authors in (Shikui Wu and et. al., 2014) have represented an effective mechanism for multi attribute e-procurement transactions. The research work also deals with a generic model for the negotiation and a set of parameters in guiding mechanism design. The authors have shown a comparison between two procurement mechanisms which use the concept of multi attributes.

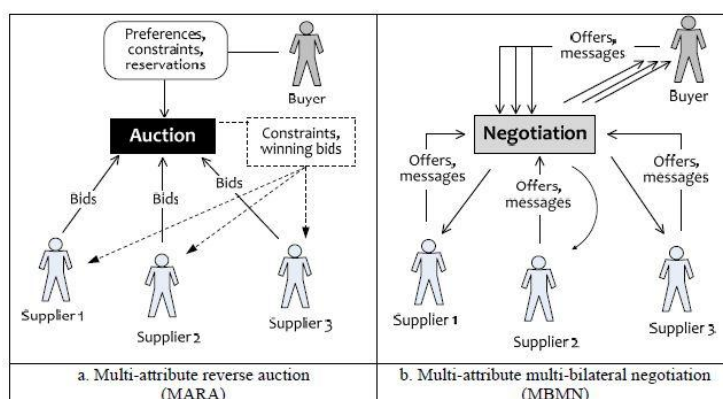


Fig 6: Comparison between MARA and MBMN.

A new approach to automate the negotiation system in e-commerce has been described in (T.Vijila and P.Vijayaragavan, 2012). This approach is based upon analysing the economic psycho knowledge. This creates a cognitive process for evaluation of service quality. Emotional aspects are involved in the act of commerce in different ways such as preferences, customer prospective for commercial decisions and social shopping community. The author proposes a tool to capture emotional aspects called as emolog for describing the emotional reactions about the commodity.

Conclusion

Negotiation is one of the important factor in e-commerce. We have seen numerous approaches to provide an efficient negotiation process during our survey. Different automated process, synchronized negotiations, agent oriented techniques have been immerged by the authors for the negotiation purposes. Even more intelligent negotiation system has also been researched by some authors. The psychological factor, emotions, and the languages in the process of negotiation have also been the research issued in the paper surveyed. In future we would like to work on effects of negotiation on other parameters in e-commerce.

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