Customer Orientation Based Multi-Agent Negotiation for B2C e-Commerce

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ABSTRACT

The Multi Agent System (MAS) model has been extensively used in different e-commerce tasks. Customer orientation is a crucial component of organizational culture and attention to information about customers’ needs should be considered a firm’s most basic value. In this paper, the authors evaluate a seller agent’s various cognitive parameters, such as capability, trust, and desire. The authors also examine customer orientation value for a pair of buyer and seller agents, such as selecting a seller and buyer agent pair using mental and cognitive parameters, customer orientation value for their mutual benefits, and the competitive negotiation factor. The authors provide a deterministic customer orientation computational model, a competitive negotiation computational model between buyer agent and seller agent, and a logical computational model for selection of the best buyer-seller agent pair. With the help of GUI intermediate, final results are shown.

Keywords: B2C, Business Process, CRM, Customer Orientation, Mental States, Multi-Agent System, Negotiation

INTRODUCTION

Multi agent system (MAS) model has been extensively used in the different tasks of e-commerce such as CRM, negotiation and brokering. A survey report, provided by international data group (IDG) by its subsidiary IDC (http://www.idc.com), estimates that the global market for software agents grew from $7.2 million in 1997 to $51.5 million in 1999, and that it will reach $873.2 million in 2008. IDC also assumes that the dramatic growth in B2B e-commerce will accelerate the demand for agents. BargainFinder (Krulwich, 1996) was the first system of this kind to employ agents and it operated in the following way: If a customer wants to buy a music CD, BargainFinder will launch its agent to collect the prices from a predefined set of CD shops, and then it will select the CD with the lowest price for the customer. Another similar example is Priceline (www.priceline.com), which carries out the same set of tasks for airline tickets, hotel rooms, and cars. Agent-based e-commerce solutions are also available such as the Lost Wax e-Commerce Platform (www.lostwax.com) supports buyers and sellers in both public and private trading...
environments and the agent-based modules can represent differing trading mechanisms (such as auctions, contracting, and negotiation). Lost Wax has worked with a number of leading companies operating trading systems in a variety of sectors. The living markets platform (www.living-systems.com) is an agent-based product for real-time optimization of processes in business networks.

Various Multi-agent models have been developed e.g. Chan, Cheng, and Hsu (2007) introduced an autonomous agent that represents the owner of an online store to bargain with customers. They consider that customers' behaviors are different, and the store should identify a customer’s characteristics and apply different tactics to make profits from customers. Various customer orientation based models (Lee & Park, 2005; Bae, Ha, & Park, 2002) have proposed a survey based profitable customer segmentation system that conducts the customer satisfaction survey and deploy mining processes for the profitable customer segmentation.

Some issues of engineering agents that partially automate some of the activities of information brokering in e-Commerce (Mong & Sim, 2000) focus on addressing the problem of connecting buyers and sellers. The process of matching and connecting buyers and sellers is divided in four stages: selection, evaluation, filtering and assignment. Trading agents have been developed which can either take or reject recommendations made by the broker agent (Suwu, 2001). They can also provide feedback to the brokering test bed by indicating their satisfaction level. Empirical researches have shown that increasing overall satisfaction leads to greater repurchase intentions as well as activates actual repurchase behavior and companies with high customer satisfaction and retention with expected higher profits (Reichheld & Frederick, 1996). For the success of CRM, it is important to target the most profitable customers of a company. Customer orientation is a crucial component of an organizational culture and attention to information about customers’ needs which should be considered as a basic value of the firm. Many CRM researches have performed the calculation of customer profitability based on customer lifetime value and also have developed a comprehensive model of it. Intelligent computing models have been used in some of the problems of customer relationship management such as customer classification and customer supplier relationship. The interactive CRM model proposed by Lee and Park provides an agent-based approach of improving customer satisfaction as well as utilizing information technology to develop the knowledge management structure. They proposed CRM model which includes four management issues: customer relationship, customer requirement, customer interaction, and customer knowledge (Lee & Park, 2005).

In a multi-agent artificial market system software broker agent can learn to build a relatively long-term trust relationship with their clients. The goal of broker agents is not only to maximize the total revenue subject to their clients’ risk preference as most other agents do but also to maximize the trust they receive from their clients. The social settings such as trust, reputation and mental states of buyer, seller and broker may also be used in an agent based model. In general, various trust models have been proposed with different components for different purposes based upon mental and cognitive approach (Chandrasekharan & Es-fandiari, 2000; Castelfranchi & Falcone, 1998; Mazumdar & Mishra, 2009).

**OBJECTIVES**

a. It provides a deterministic customer orientation computational model which is the set of cognitive and mental computational model and business computational model for selection of the best buyer-seller agent pair.

b. It provides a competitive negotiation computational model between buyer agents and selected seller agent which is helpful for utility computational model for cooperative negotiation between most profitable...
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