Chapter 16
Multi-Agent Negotiation in B2C E-Commerce Based on Data Mining Methods

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ABSTRACT

The Multi agent system (MAS) model has been extensively used in the different tasks of e-commerce like customer relation management (CRM), negotiation and brokering. For the success of CRM, it is important to target the most profitable customers of a company. This paper presents a multi-attribute negotiation approach for negotiation between buyer and seller agents. The communication model and the algorithms for various actions involved in the negotiation process is described. The paper also proposes a multi-attribute based utility model, based on price, response-time, and quality. In support of this approach, a prototype system providing negotiation between buyer agents and seller agents is presented.

INTRODUCTION

Various Multi-agent models have been developed. 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 on customers. Various customer orientation based model are given in Park and Lee (2005). Ha, Bae, and Park (2002) proposed a survey based profitable customer segmentation system that conducts the customer satisfaction survey and those 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 agent 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 to actual repurchase behavior and companies with high customer satisfaction and retention can expect 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 should be considered as a basic value of the firm. Many CRM researches have been performed to calculate customer profitability based on customer lifetime value and develop 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 Hsien-Jung Wu 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 (Wu, 2005).

PROBLEM DESCRIPTION

From the perspective of customer orientation for customer relationship marketing (CRM), establishing and maintaining the best possible relationship with valuable buyer is a good way to survive in the competitive global market. The problem is firstly described by collecting information of 23 business and cognitive parameters of buyers and sellers agents.

The proposed model is orientation based profitable buyers and profitable seller categorization system based on data mining and agent technology that designs, executes (on-line, etc.) on business and cognitive parameters of buyers and sellers and conducts data mining process for the profitable buyers and sellers categorization. It has multi-agent based architecture and integration of data mining process into decision support system framework (Figure 1).
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