Comparative Shopping on Agent Web Sites

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INTRODUCTION

The enormous amount of commercial information available on the Internet makes online shoppers overwhelmed and it difficult to find relevant information. The recent development of shopping agents (bots) has offered a practical solution for this information overload problem. From the customer's point of view, a shopping agent reduces search complexity, increases search efficiency, and supports user mobility. It has been proposed that the availability of agent Web sites is one of the reasons why e-markets should be more efficient (Mougayar, 1998).

Shopping bots are created with agent software that assists online shoppers by automatically gathering shopping information from the Internet. In this comparative shopping environment, shopping agents can provide the customer with comparative prices for a searched product, customer reviews of the product, and reviews of the corresponding merchants. The agent will first locate the merchants' Web sites selling the searched product. Then, the agent will collect information about the prices of the product and its features from these merchants. Once a customer selects a product with a merchant, the individual merchant Web site will process the purchase order and the delivery details. The shopping agent receives a commission on each sale made by a visitor to its site from the merchant selling the product on the Internet.

Some auction agent Web sites provide a negotiation service through intelligent agent functions. Agents will represent both buyers and sellers. Once a buyer identifies a seller, the agent can negotiate the transaction. The agents will negotiate a price and then execute the transaction for their respective owners. The buyer's agent will use a credit card account number to pay for the product. The seller's agent will accept the payment and transmit the proper instructions to deliver the item under the terms agreed upon by the agent.

BACKGROUND

The software agent with roots in problem solving and knowledge representation was not a new concept, but had not grown until the past decade when the Internet created a perfect environment for e-commerce. Dr. Pattie Maes, founder of the MIT Media Lab Software Agent Group, and other researchers have developed a number of intelligent shopping agents. Based on the customer buyer behavior (CBB) model, Maes and Guttman (1999) identified and implemented six stages of the buying process: need identification, product brokering, negotiation, purchase and delivery, product service, and evaluation. Need identification characterizes the buyer's need. Product brokering includes retrieval of product recommendations to help determine what to buy. Merchant brokering utilizes merchant ratings to help determine whom to buy from. Negotiation considers how to settle on the terms of transactions. Purchase and delivery signal termination of the transaction process. Product service and evaluation involve post-purchase services and evaluation of satisfaction with the overall buying experience and the decision.

Shopping agent technology has been accepted by a large number of e-commerce practitioners in recent years. The popular shopping bots are bestWebBuys, bizRate, dealTime, kelkoo, mySimon, nextTag, and priceGrabber. A 2002 report from bizRate.com found that 77% of U.S. online shoppers said that they use comparison shopping bots when shopping online (Laudon & Traver, 2003). More and more merchants have subscribed to agent Web sites to attract online shoppers. The number of listed member merchants has increased exponentially. PriceGrabber, which added software agents and raised the standard for online shoppers' comparison Web sites on November 8, 1999, had 1,050 subscribed merchants by the end of October 2003 and 5,925 subscribed merchants by May 2005. PriceGrabber achieved a fifth place standing in the 2004 Deloitte Technology Fast 500, a ranking of the 500 fastest growing technology companies in United States. Rankings are based on the company's percentage revenue growth over five years, from 1999-2004.

SHOPPING AGENT ESSENTIALS

Most shopping agent Web sites currently offer online shoppers three features: customer reviews of a product, competitive prices of the product, and ratings of the merchant who sells the product. These features help

customers select an appropriate product within a reasonable price range and choose merchants they can trust and feel comfortable shopping with.

Issues

Product Reviews

The product reviews on an agent Web site are contributed by customers shopping on the agent Web site. The product review system is able to provide a large volume of product reviews. Avery, Resnick, and Zeckhauser (1999) studied the potential of a market for evaluations and indicated that personal experience with products is enormously powerful in forming the customers' decisions.

Behavioral research suggests that consumers view recommendations of unfamiliar products negatively (Park & Lessig, 1981). Ganesh and Amit (2003) focused their research on how product review systems affect customer preferences of unfamiliar products since recommendations of unfamiliar products represent an important new source of business. The result demonstrates that positive contextual recommendations based on a customer's prior purchase interest do not always produce positive effects on the sale of new products. Contextual recommendations may be beneficial when they are known to be attractive to the customer and are likely to be perceived as similar to the target item. The context can be provided in a manner that makes it salient when customers first encounter the unfamiliar recommendations. Conversely, new recommendations should be presented when little is known about the shopper and when familiar recommendations are likely to be perceived as different from the unfamiliar recommendations. It is important that designers of shopping agent Web sites create contexts judiciously and offer tentative guidelines for product review systems.

Competitive Price

Internet technology has increased price transparency of a product. Online customers are likely to compare prices to other Web sites and traditional stores. Most shopping agents claim to eliminate search necessary to identify the right product at the best price offered by each of the merchants. They take a query, visit their member e-tail stores that may have the product sought, bring back the results, and present them in a consolidated and compact format that allows for comparative shopping at a glance. The impact of this comparative price system lowers the search cost not only for consumers, but also for merchants who wish to find out what prices their rivals are

charging. This makes it more difficult for merchants to undercut each other secretly (Vulkan, 1999).

Merchant Reputation Ratings

In addition to obtaining competitive prices and product recommendations, many shopping bots have developed systems to keep track of merchant reputation ratings as well as service quality, simply because consumers want to know that the merchant with whom they are transacting an order is reliable, will deliver the product as specified in the delivery schedule, will maintain confidentiality, and will have appropriate product packaging and handling arrangements. So far, the merchant reputation system is best known as a technology for building trust and encouraging trustworthiness in e-commerce transactions by taking past behavior as a publicly available predictor of likely future behavior (Dellarocas, 2003).

Resnick, Zeckhauser, Friedman, and Kuwabara (2000) have defined a reputation system as one which collects, distributes, and aggregates feedback about merchants' past behavior. Though few producers or consumers of the ratings know one another, these systems help people decide who to trust and also encourage trustworthy behavior. The merchant reputation has significant impact on customers' trust and on their intentions towards adopting e-services (Ruyter, Wetzels, & Kleijnen, 2001). In February 2003, Jeff Bezos, the CEO of Amazon.com, decided to cancel all plans for any television or general print advertising because he believed that his company was better served by word-of-mouth generated through the Internet than by paid advertising.

Problems

Despite its undeniable importance and widespread adoption of agent technology, the current shopping agent Web sites still encounter problems: fraud risk management, rating consistency, and biased rating. These problems are discussed in the following section.

Fraud Risk Management

Key facets of the usefulness and successful adoption of emerging reputation systems are their accuracy, consistency, and reliability. A group of academic scholars conducted research on the risk management of merchant reputation systems. Kollock (1999) states that online rating systems have emerged as an important risk management mechanism in the e-commerce community. Dellarocas (2000) identified several scenarios ("ballot stuffing," "badmouthing," positive seller discrimination, negative seller

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