

Comparison Shopping Agents: the Essential Characteristics and Challenges to be met

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Abstract— Comparison Shopping Agents are web applications that can help on-line shoppers to find the optimized value for commodities and/or services by parsing product descriptions. Adaption of mobile agent system, which has capability of effectively supporting the distributed applications in open and heterogeneous environments, is best suited for comparison shopping agent implementation. The major goal of this paper is to present a study of the characteristics of different stake holders in multiple perspectives. The paper addresses various issues and challenges, indicating a need for further empirical research.

Keywords—agent; comparison shopping; consume; vendor

I. INTRODUCTION

Online markets are increasingly getting popular, as the vendor entry into any of these markets is almost inexpensive and customer has an option of purchasing an item from the vendor of his choice, sitting at his desk. A Comparison Shopping Agent (CS Agent) is usually robust and fault tolerant and helps customers to decide what to buy by finding specifications and reviews for products, comparing products, vendors and service according to user-defined criteria. The main drawbacks with existing agents are the information overhead. It is very difficult to design agents that can perform negotiations, security, identity and trust. This paper attempts to put together an identified set of problems to be solved and models the essential characteristics required of a successful shopping agent, in particular for a comparison shopping agent.

II. COMPARISON SHOPPING AGENT

“E-market is an information system that provides virtual space for its participants to exchange information about the product and service offerings and negotiate [2] and carry out the business transactions”.

The shopping procedure is as shown in Fig.1, the client agent initially poses a query about the product and collects the vendor information with respect to the product. The client then chooses the vendor to start the price negotiation. The client agent makes payment to an intermediate institution after reaching a price negotiation agreement with the vendor. After receiving payment information from intermediate institution, the vendor agent supplies the requested product to the client agent and receives acknowledgement for the same. Finally, the

intermediate institution ends up the task by paying the price to the vendor agent.

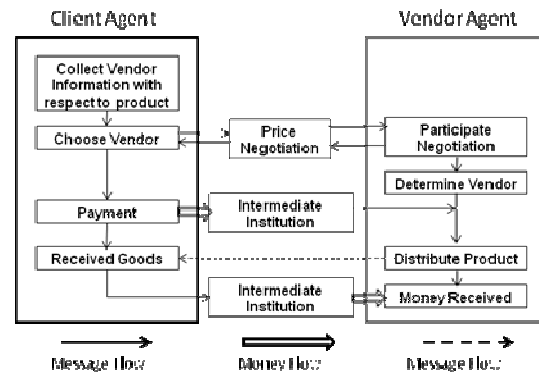


Figure 1. Structure of Comparison Shopping Market

III. CHARACTERISTICS OF DIFFERENT STAKE HOLDERS

The stakeholders involved in comparison shopping system are the shopping agents, consumer, merchant and the technology provider.

To automate the customer’s shopping process, the shopping system should possess the characteristics like autonomy, adaptation to customer preferences, multiple supplier access, and shopping process. When a consumer uses comparison shopping either (1) to find the lowest possible price of a specific product, or (2) to find information, reviews, customer ratings and comments posted by other customers and make a better buying decision. In vendor prospects’, the main objectives to be met with a shopping agent are to increase his income in short term and assure income in the long term. In the technological aspect, a comparison shopping that is compatible to expand various merchant site formats and that can quickly adapt to new formats and changing merchant sites.

IV. CHALLENGES

Despite the obvious benefits of using a shopping agent to compare prices on a wide range of products, even the top comparison shopping sites (shopbots) found themselves fighting to stay afloat. This section discusses the challenges that a comparison shopping agent should address in different stake holders’ perspective.

A. Consumer

Shopbots have yet to address many issues like: (1) the impact of shopping agents on customer's decision making, (2) only the merchant sites registered or listed are searched, new vendors cannot discover and query at run time, (3) the consumer may not come across vendors who offer attributes like guarantee, service etc., and may finalize the selection based on price which is not everything, (4) accuracy of information retrieved is not guaranteed, (5) conventional online shops are primarily designed with only "expert" buyers in mind, (6) the proportion of online customers who really rely on product recommendation systems and online reputation systems remain strange, (7) recommendations offered by shopping agents may be biased and there may be discrepancies between reported and listed prices.

B. Business

It is difficult for a search engine to extract specific information, such as price, from wide variety of web pages. If merchants change their web page formats, it will take a long time to change the mechanism used for that merchant site. Currently most shopping bots provide consumers with only limited information such as price, a brief description of items, and a merchant link. So, other factors such as shipping date, warranty information, creditability of a merchant and service etc. often affect customer's shopping decisions. Most existing shopping bots are very slow and take minutes to generate such results. As the local databases are only periodically updated, the search results are often out-of-date and not very accurate.

C. Technical

At present, the World Wide Web is based mainly on documents written in HTML for online markets [5], which gives poor search results. Hence, semantic web technology allows Resource Description Framework (RDF) and ontology based knowledge. The designers of the intelligent web agents need to address the following questions [1]: (1) to what extent can an agent understand information published at websites? (2) does the agent understand the task sufficiently to provide genuine assistance to users? (3) can the agent automatically extract information from unfamiliar websites? and (4) what aspects of the web facilitate this competence?

D. Agent Security

One of the most important challenges raised by the mobile agent paradigm is security. As the growth of network and computing technologies, a demand for distributed applications has been increased and it is difficult to find commercial distributed applications in the market using mobile agent because it is vulnerable to a variety of security attacks. However, the implementation of security services for the protection of hosts and agents causes the degradation of performance of the system.

E. Other Challenges

1) *Remote Execution Time*: The execution time for a mobile agent at the remote server depends on the nature of the

task, how much data the mobile agent should access, the complexity of the task and the current state of the remote server.

2) *Retailers may not co-operate*: Retailers avoid internet price comparison sites due to increased transparency and only limited attention has been addressed in retailer competition.

3) *User Interface*: Once shopping environment is established on the www, the user interface will become the next important issue, which includes the efficient structure of shopping pages and techniques used for displaying items attractively.

4) *Trust among the collaborative agents*: Due to the decentralized nature, trust establishment [3, 4] in P2P systems have to rely on the collaboration among all members.

V. CONCLUSIONS

The impact of shopping agents on customer shopping decision making process needs to be studied. Some customers will not use shopping agent web sites either because they don't know about them or because they are reluctant to delegate decisions to an artificial agent. Despite high expectations, comparison shopping has yet to significantly facilitate satisfying online shopping experience for users. Shopping agents will remain a part of the e-commerce landscape only if they make several changes, such as increasing customer awareness by means of advertising, increasing their level of user friendliness by cleaning up page design and clarifying search procedures and offering more information and the return policies of merchants. By taking advantage of semantic web and web services technologies, we can overcome current technological limitations and finally realize the comparison shopping significant potential.

In this paper, a comprehensive introduction about a comparison shopping agent is given. The basic approach of using mobile agent as shopbot along with its features are discussed based on the characteristics of consumer, business and shopping system. Current limitations, deficiencies of shopbots and how these can be addressed, are discussed. Several challenges are listed for future implementation of comparison shopping agent.

REFERENCES

- [1] R. B. Doorenbos, O. Etzioni, and D. S. Weld, "A scalable comparison shopping agent for the world wide web," ACM Proc. of the First Int. Conf. on Autonomous Agents, pp. 39-48, 1997.
- [2] H. Ouchiyama, T. Yamazaki, and R. Huang, "An e-shopping system with different negotiation model," Proc. First Int. Symp. on Cyber Worlds, IEEE Computer Society, pp. 311-317, 2002.
- [3] B. Zhu and S. Jajodia, M. S. Kankanhalli, "Building trust in peer-to-peer systems: a review," Int. Journal. of Security and Networks, Volume 1, Issue 1/2, pp. 103-112, 2006.
- [4] RVVSV Prasad, V. Srinivas, V. Vallikuumri and KVSVN. Raju, "Credibility based reputation calculation in P2P networks," Springer, ICDCIT 2008, LNCS 5375, pp. 188-195, 2008.
- [5] C. Kocas, "Online price competition within and between heterogeneous retailers groups," IEEE Proc. 37th Hawaii Int. Conf. on System Sciences, pp. 10-, 2004.