Chapter 18

Intelligent Store Agent for Mobile Shopping

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ABSTRACT

The conventional shopping process involves a human being visiting a designated store and perusing first the items available. A purchase decision is then made based on the information so gathered. However, a number of unique challenges a human shopper would face, if he/she prefers to execute this process using a mobile device, such as a phone. Taking this aspect into consideration, the authors propose the use of an Intelligent Agent for performing the Mobile Shopping on behalf of customers. In this situation, the agents gather information about the products through the use of ‘Store Coordinator Agents’ and then use them for comparing with the user preferences. The proposed agent based system is composed of two agents, viz., a User Agent and Store Coordinator Agent. The implementation of the scheme so proposed has been done using JADE-LEAP development kit and the performance results are discussed in the paper.

INTRODUCTION

There has been an exponential growth in the use of digital mobile devices in various fields these days. This has resulted in an increased effort to develop various commercial applications that would provide leverage to this extensive use of these digital mobile devices rather than desktop PCs. One such area is the evolution of e-commerce having application in mobile commerce (m-commerce). There is no precise meaning for m-commerce or mobile e-commerce as such, however, the core of mobile e-commerce (Abbott, 2001) uses a terminal such as a telephone, PDA, or custom terminal and the public mobile network to access information and conduct business transactions that result in the transfer of value in exchange for information, services or goods. Some examples of m-commerce
Intelligent Store Agent for Mobile Shopping

(Abbott, 2001) include the purchasing of airline tickets, purchasing of movie tickets, restaurant bookings and reservations, mobile banking and so on. We have taken the Mobile Shopping Activity as our research initiative and the results of this effort in using an intelligent agent to replicate the role of a human agent, are presented in this paper.

Normally when we think of buying a particular product (Thomas & Harold, 2003), things that normally come to our mind are the price, the quality, the brand, etc., of the desired product. To get this information, we often do window shopping in the conventional shopping method before we decide on buying the product. In electronic shopping we put an appropriate query, taking into consideration factors like the cost, the quality of product, etc. We also at times, compromise on the selection of the item, if we do not get an item suiting to our preconceived specifications. We human beings, under such circumstances, interpret various aspects depending on several considerations and make a balanced compromise before taking a decision on the deal.

In the mobile environment which we propose in this paper, the same job will be replicated by an intelligent Agent (Baldi, 1997; Carzniga, 1997; Ghezzi & Vigna, 1997; Puliafito & Tomarachio, 1999; Suresh, 2001; Suresh, 2006) for getting the details on the specifications of the customer desired item by performing the search operation – a replication of the job done by a human agent in window or electronic shopping. It may be mentioned here that considerable research attention is being paid to the application of agents in various areas, these days. Taking these aspects into consideration we propose in this paper an intelligent store agent based mobile shopping technique in which an intelligent store agent performs the job of getting the price, quality of product, brand etc., based on the request of the client/user, which amounts to replicating the functioning of a human agent. The intelligence possessed by the store agent is good enough to retrieve the details of the products available based on the exact specification given by the client but in addition try to match the price specified with the other available likely products in the store. This paper however does not focus on payment, user authentication and such other things, as it is beyond the scope of this research. The reminder of the paper is organized as follows. E-commerce and m-commerce technology are discussed, and then the next section talks about the functioning of the intelligent store agent as a mobile shopper. Next, the details on the architecture of the proposed intelligent store agent are discussed, the details on the implementation of the intelligent store agent for mobile shopping activity, using J2ME and JADE-LEAP combination, are provided. Finally, results and a conclusion are discussed.

E-COMMERCE AND M-COMMERCE

Electronic commerce (e-Commerce) (Abbott, 2001) refers to the buying and selling of products or services over electronic systems such as the Internet and other computer networks. The definition has evolved since its inception; in as early as in 1970’s, the technique of e-commerce was merely the sending and receiving of invoices electronically using varying technologies including EDI (Electronic Data Interchange). The period during 1980’s saw the emergence of other forms of e-commerce, which included telephone banking, credit cards and the ATM (Automated Teller Machine). From 1990’s onwards, e-commerce technique included enterprise resource planning systems (ERP), data mining and data warehousing. Most recently, since 2000, a significant amount of businesses have offered their services on the World Wide Web and persons have started to associate e-commerce with purchasing goods through the Internet via secure protocols and electronic payment services. Consequently, among the most widely used security technologies is the Secure Sockets Layer (SSL), which is built into both the leading Web browsers.

M-commerce (Abbott, 2001) is often represented as a derivative of e-commerce, implying