Chapter II
The Next Generation of Shopbots: Semantic Interoperability and Personalization

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ABSTRACT

The huge growth of e-commerce has had a profound impact on users who can now choose from a vast number of options online. Inevitably, as the number of choices has increased, so has the need for tools to help users organize, manage and utilize information on these for better decision-making. Comparison shopping agents or shopbots can help users decide what to buy and enhance their online shopping experience. However, despite the high expectations, the immense potential of shopbots has not been fully realized. In this chapter, the author identifies the limitations and drawbacks of current shopbots, in particular, with regard to the underlying technology for building such systems. She then discusses how these technical limitations can be overcome by making use of the Semantic Web and Web Services. She also considers how shopbots can truly serve the user by providing personalized, impartial and flexible services.

INTRODUCTION

The phenomenal growth of the Internet has had a profound impact on the way organizations and individuals conduct business. In particular, the nature of business-to-consumer commerce (B2C) has changed dramatically over the last decade. Businesses and organizations have recognized the potential of the Internet and the World Wide Web as the means to reach potential customers on a scale never before possible or imaginable. To begin with, users were wary of online shopping
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and reluctant to provide personal and financial information (credit card details, date of birth, bank accounts etc.). This was mainly due to fear of fraud and loss of privacy. But with the recent advances in security and cryptography (Stallings, 2003), users have gradually become more familiar with the technology and more willing to engage in e-commerce activities. As a result, e-commerce sites abound offering a wide range of services and products. Online users can now shop from the privacy of their homes for almost anything ranging from groceries to holidays and cars (Fasli, 2006). Hence, slowly but steadily, the traditional shopping trip has been transformed into a virtual one: instead of having to visit a conventional shopping mall, a user may now visit virtual shopping malls which may be operating from a different city, state, country or even continent than the one the user is physically located.

Reflecting the changing consumer attitudes, online transactions have increased dramatically over the last few years (Forrester Research, 2002; Shop.org, 2007). Retail e-commerce sales in the U.S. have risen steadily since 1999 (when e-commerce sales were first tracked) as can be seen in Figure 1. The estimated U.S. retail e-commerce sales for the second quarter of 2008 (figures are adjusted for seasonal variation, but not for price changes) was $34.6 billion which amounts to 3.3% of the total sales figure. This is an approximate increase of 9.5% from the second quarter of 2007.

In January 2008 Nielsen (Nielsen Media Research, 2008) reported that the number of users that have shopped online was up 40% in two years amounting to 875 million. According to the Nielsen report the most popular commodities purchased online are (1) books; (2) clothing, accessories and shoes; (3) DVDs, games and CDs; (4) airline tickets; and (5) electronic equipment such as cameras, computers and computer parts.

But this abundance of products, services and information, has made it all the more difficult for users to decide what to buy and where from. Inevitably, as the number of choices has grown, so has the need for tools to help users organize, manage and utilize this information for better decision making. Agent technology can help us-

Figure 1. Estimated quarterly U.S. retail e-commerce sales as a percent of total quarterly retail sales between 4th quarter 1999 – 2nd quarter 2008 (source: (US Census Bureau News, August 2008))