

Enabling Technology and Functionalities of Shopping Portals

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INTRODUCTION

An electronic marketplace (e-marketplace) is a virtual space where buyers and sellers exchange goods and services (Bailey & Bakos, 1997). An e-marketplace that searches for and aggregates information from multiple vendors and presents information of related products and services to individual consumers is an example of a business-to-consumer (B2C) shopping portal. Many smart online shoppers start from a shopping portal that provides the added ability for a shopper to compare prices, read reviews, find deals, and even create a wish list or apply for credit cards. Examples of such sites include Yahoo! Shopping, bizrate.com, shopzilla.com, nextag.com, and the marketplace function of amazon.com, where new and used books from online vendors and individuals are listed and sold.

As those e-marketplaces are bringing about structural changes to how businesses are conducted online, interest in these markets has significantly increased (Ratnasingam, Gefen, & Pavlou, 2005). To help both marketing practitioners and system designers gain an understanding of the factors contributing to the success of any online shopping portal, this article discusses the enabling technologies of a Web portal and the key functionalities of these B2C shopping portals. This article reflects the current state of research and will shed light on future avenues of exploration.

BACKGROUND

The Web owes its growth to HTML, the HyperText Markup Language. Due to its open-platform and nonproprietary nature, it became the standard language of the World Wide Web. It uses markup tags to format text and other elements in a document that can be displayed on a wide range of Web browsers. Since January 2000, XHTML (eXtensible HyperText Markup Language) has replaced the last version of HTML (v. 4.01) to become the W3C (World Wide Web Consortium) recommended standard for Web site development.

HTML and Client Side Scripting

Even though HTML was a primary tool in creating Web pages, it has its limitations. HTML pages are static pages. The widespread use of the Internet by businesses and other organizations demanded dynamism of Web sites. A dynamic Web page enables different content to be displayed at different times, for different users, on different browsers, and in response to different user actions. A shopping portal is a dynamic Web application that includes personalization, search engines, member databases, shopping carts, user feedback forms, and customer rating and merchant reputation databases, among others. The technologies enabling these functions in a shopping portal include client-side scripting, server-side scripting, and server-side programming.

Interactivity of a Web page can be achieved through the use of client-side scripting such as JavaScript. Scripts are embedded in HTML documents between a pair of `<script>` and `</script>` tags. The typical output of a script is some text, images, or other elements inserted into the Web page in which the script is embedded. For example, once a user is logged into Yahoo!'s shopping portal, a function written in JavaScript generates a message that says "Welcome, (*user name*).". JavaScript can also create such eye-catching effects as rotating banners or slide shows as well as performing data validation on a form.

The use of client-side scripting provides a certain level of interactivity without increased traffic to the server. However, two major limitations with client-side scripting are that not all scripting languages are supported by all browsers and that the code is visible to the client on the Internet and thus could pose a potential security problem. Mobile and handheld devices may not interpret client-side scripts. Server-side scripting and programming resolve these problems and provide added capability in database operations.

Server-Side Applications

Server-side scripting functions as the following: when the server receives a request for a Web page containing server-

side scripts, it will execute the embedded code first and send the output to the client without the client knowing there was script in the first place.

PHP (Hypertext Preprocessor) is a server-side scripting language. PHP code in a typical HTML page is inserted between the opening `<? tag and the closing ?> tag. The PHP code is never exposed to the client (PHP, 2005).`

Server-side scripting can also be written in other languages such as C, Visual Basic, and Perl. Common gateway interface (CGI) is a protocol that when combined with a scripting language such as Perl and PHP, enables server-side scripting that queries databases and generates reports.

Microsoft uses active server pages (ASP) to create dynamic Web applications. ASP evolved from server-side scripting to its current server-side programming within Microsoft's .NET framework. As a platform, with its current version being ASP.NET 2.0, it works with a number of programming languages including Visual Basic .NET and Visual C# .NET, and their successors in the new Microsoft Visual Studio 2005 suite. With the ActiveX data object model (ADO and ADO.NET) interfacing with databases, Web applications developed on the ASP.NET platform enable the exchange of data across the Internet (Walther, 2006). Recent developments also include Asynchronous JavaScript and XML (AJAX), which enables the exchange of small amounts of data between the client and the server so that the user perceives the application to be more responsive since there is no need to reload the entire page (Garrett, 2005).

In summary, server-side scripting and applications allow for delivery of better personalized Web pages such as a list of saved products on your wish list and more accurate query responses.

Web Services (WS)

Interfacing between a portal site and the subscribing vendors is achieved through Web Services, which were brought about by SOAP (simple object access protocol) (W3C, 2002). Residing in the transport layer of the ISO model, SOAP defines an envelope for carrying XML (eXtensible Markup Language) data across the Internet (W3C, 2000). WS applications allow business systems to connect and work with each other. For example, a marketplace vendor at www.amazon.com exposes, that is, allows to be interfaced, part of its catalog or product ordering application so that a visitor to www.amazon.com can view the products from that vendor and place items in a shopping cart without leaving the portal site. A WS application is a business-to-business application built upon open standards and it allows interoperability across platforms. Documentation of several case studies of how Microsoft's enterprise customers make use of WS can be found at its Web site (Microsoft WS, 2006).

In collaboration with IBM and Oracle, Sun Microsystems developed its Java-based Java EE (formerly J2EE) platform

for programming Web services (Tyagi, 2005). Microsoft on the other hand, bundles Web services applications in its .NET framework, which works with ASP.NET and a number of programming languages such as Visual C# .NET and Visual Basic .NET. The current version of the .NET framework is .NET 2.0 in Visual Studio 2005 (Walther, 2006). Both Java EE and .NET have incorporated security and identity features in their packages, which ensure the integrity of data transmitted and the authentication of user identity.

KEY FUNCTIONALITIES OF A SHOPPING PORTAL

Web technologies surveyed in the previous section serve as the foundation of Web portals that meet the demands of their users in interactivity and dynamism. Summarily, with any Web site that interacts with its customers, the ease of navigation, the overall aesthetic appeal of the site, and the download speed are the basic areas of concern Web marketers have to pay attention to (Nielsen, 2004). The implementation of security mechanisms and consumer perceptions of security at any Web site, portals included, have a significant impact on trustworthiness of an online company. Nonetheless, e-marketplace portals have their own unique functionalities that make it more useful and valuable than other e-commerce Web sites. They include personalization, an intelligent search engine, and a merchant reputation system, among others. All of these functionalities require the implementation of advanced data-drive server-side applications.

Personalization

Personalization is to provide repeat customers a specialized Web page that incorporates information on goods and services that are most likely of interest to the customer. Personalization is a key aspect of a company's customer relationship management system (CRM) (Andre & Rist, 2002). While a personalized Web page may be generated through embedded client-side scripting, sophisticated personalization at a shopping portal requires server-side programming.

A portal site personalizes Web pages through explicit profiling and implicit profiling. Whereas explicit profiling relies on that the user is logged in and a personal profile has been provided in the database, implicit profiling uses information collected from the click streams such as pages visited, products reviewed, and time spent on these pages (Kumar, 2005). The response to a search query input by the user often signals the level of personalization a Web site is able to provide. For example, a personalized site will provide not only a list of products searched for, but also some featured products and recommendations based on explicit and implicit profiling.

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