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ITP4221

Implementing Privacy Ingredients Within An Electronic Storefront

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INTRODUCTION

According to the International Data Corporation (IDC), the worldwide Internet economy will soar past the one trillion dollar mark in 2001. By 2003, it will be well on its way to a remarkable three trillion dollar amount. However, for several years now public opinion polls have shown an increasing level of concern about privacy. In fact, a recent study by *Purchasing* magazine showed that on a scale of 1-10, the level of concern about online privacy returned a weighted average rating of 7.6 with 67% customers putting their concern level between 8 and 10 on the scale (Porter, 2000). Obviously this concern is heightened as more customers engage in e-commerce activities that collect personal information. Even though customers may benefit substantially from online information gathering by receiving customized products and services, concerns about their privacy are still on the rise (e.g., Mendel, 1999; Stepanek, 1999; Kleinbard, 2000, Green et al. 2000).

In order to ease customers' concerns about the online privacy, Federal Trade Commissions (FTC) proposed that fair information practices should include four privacy dimensions (FTC Congress Report, 2000):

- **Notice**, where appropriate, prior to collection of data,
- **Access**, allowing people both access to and modification of data collected about them,
- **Choice**, providing people a choice to share or use their information,
- **Security**, keeping the data secure both internally and externally

In order to access the effectiveness of privacy protection, the FTC promotes adherence to these four dimensions. Although there have been studies to explore privacy issues, examples of how to integrate privacy dimensions with an electronic storefront and the lessons learned could not be found in a literature review of IS and marketing. Therefore, a research project was undertaken to experimentally assess the integration of privacy elements with the development of an electronic storefront: a virtual bookstore.

PROJECT OVERVIEW

This project was to design a hypothetical virtual bookstore called Husky Virtual Bookstore (HVBS) at a mid western university. Students can visit the HVBS electronic storefront, browse the site based on their academic departments, view textbook requirements and descriptions, and purchase books. The emphasis was to include the privacy elements within the online bookstore. This was a hands-on development experience with the aid of Microsoft Site Server Commerce software and Virtual InterDev. The HVBS bookstore included the following major components:

(1) *Introduction Page*: It provides a detailed explanation of what information will be collected and how it be used at the HVBS bookstore.

(2) *Main Page with Privacy Seal*: It contains general information about the HVBS bookstore, as well as the links (or map) to all academic departments. This page also includes a privacy seal. In addition, at the bottom of the screen, a scrolling message was displayed to address data security and the reason for collecting data.

(3) *Textbook Category Page*: It contains available textbooks such as database application, project management, operating systems, system analysis and design, etc. for the management information systems department. A pop up window is displayed to inform the customer about the cookie function when they visit this page.

Figure 1: Introduction page at HVBS

Figure 2: Privacy policy page at HVBS

(4) *Textbook Description Page*: It contains information that is specifically related to the selected book, such as book content, price, and so on. From this page, a customer can view the book, and then add the book to the shopping basket. A scrolling message was used at the bottom of the screen to explain to the customers how *data security* was insured at the HVBS site.

(5) *Shopping Basket Page*: It contains a list of books that a customer has decided to purchase. This page calculates and displays the total amount for the customer.

This paper appears in *Issues and Trends of Information Technology Management in Contemporary Organizations,* the proceedings of the Information Resources Management Association International Conference.

Figure 3: Main page with privacy seal

Figure 4: Textbook category page

Figure 5: Textbook description page

Figure 6: Shopping basket page

(6) *Order Registration Page*: This page collects customer information such as: customer name, address, telephone number, email, and the like.

(7) *Verification Page*: A verification page was used at the HVBS site to allow customers to view and update their personal information. The site would immediately update the customer information upon notification by the customer of changes needed. This ensures that the *access* dimension of the privacy principle is enforced.

(8) *Order Processing Page*: This is the final stage of the order processing. Credit card number is required here to complete the business transaction. A scrolling bar message is again applied to ease customers' concern about data security. The site guarantees the *secure* element of the privacy principle by implementing Secure Socket Layer, firewalls and proper auditing procedures. In addition, a confirmation page displays a message informing customers that the order is successfully executed. It also provides customers with a confirmation number for the reference.

(9) *Choice Page*: The HVBS site addressed customer concerns about internal and external secondary data use (where information is collected for one purposes but is used for another). It is not uncommon for businesses to find new uses for data within their internal business units and with their business partners. However, customers should have the right to choose whether to allow internal and external secondary uses of their information before accepting additional product/service information or marketing promotions. They should have the right to opt in and opt out.

During the project development, a number of redesigns were necessary in order to adjust and achieve the best possible effects of an online shopping environment. In addition, many active server page (ASP) techniques were used to combine HTML, client-side, and server-side scripts to produce dynamic Web pages for the HVBS site including privacy elements.

At the final stage of the experiment, an online survey questionnaire was posted at the HVBS Web site. The survey was to examine the

Figure 7: Order registration page

Figure 8: Verification page

relationship between the two research constructs: privacy concerns and customers' trust. The subjects for the experiment were selected on a convenience basis from enrollment in five information system courses. The result of the survey suggests that a complete privacy statement leads to improve customers' trust to engage "relationship exchange" with the businesses.

PROJECT DEVELOPMENT ENVIRONMENT

The design effort in this project is mainly focused on the server part of the equation.

(1) *Hardware Environment*: The server machine that hosts the HVBS Web site has an Intel Pentium III 500 MHZ Processor, 96MB RAM, 2-ten GB hard disks, and 3Com EtherLink 10/100 PCI network card.

(2) *Networking Environment*: The Web server chosen for this project is the Internet Information Server 4.0 (IIS 4.0). The IIS 4.0 is available within the Windows NT server package. Windows NT server 4.0 is chosen for the networking environment and its IIS 4.0 is chosen for building Web server for this project.

Figure 9: Order processing page

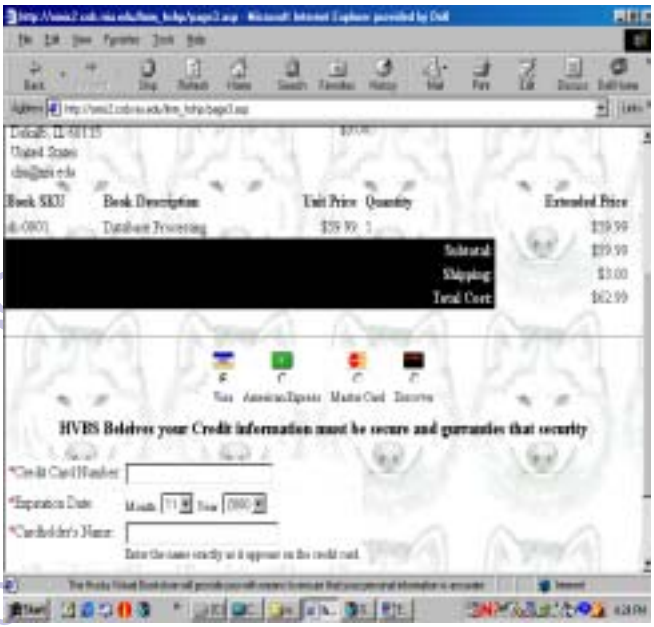
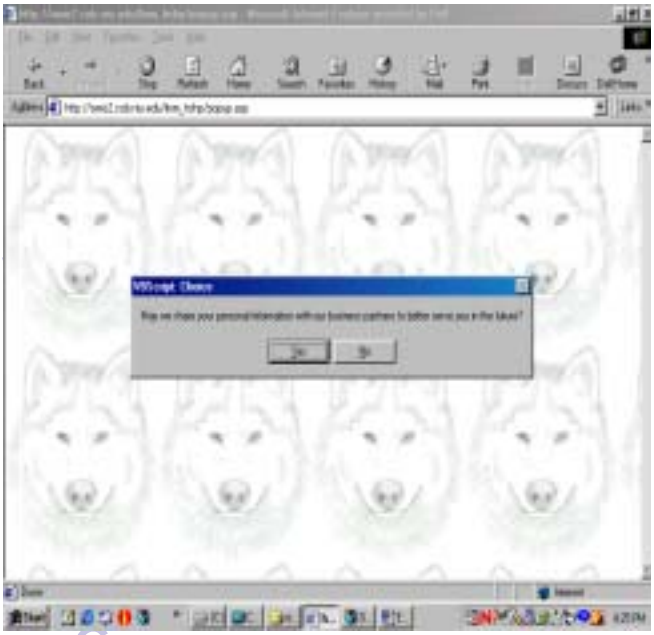


Figure 10: Customer choice page



(3) *Software Tools*: Microsoft Site Server 3.0, Commerce Edition and Microsoft Visual InterDev 6.0 are the two major software tools for the project development. Site Server Commerce Edition is a comprehensive Internet commerce server, optimized for Microsoft Windows NT Server 4.0 and the IIS 4.0. Although Microsoft Site Server 3.0, Commerce Edition is powerful for site creation, management, and maintenance, customization is better supported with Microsoft Visual InterDev 6.0. Visual InterDev provides a design environment to build dynamic Web-based applications through the use of ASP. Therefore, Microsoft Visual InterDev 6.0 is employed for site customization of the Husky Virtual Bookstore that was established by Microsoft Site Server 3.0, Commerce Edition.

(4) *Database Integration*: Since Microsoft SQL Server 7.0 is the premier database engine for the Windows NT platform, it was chosen

with Microsoft Access as the database systems to serve and maintain user information at the HVBS site. ODBC (Open database Connectivity) is the chosen method for database connectivity through a system data source name (DSN).

PROJECT DEVELOPMENT PROCESS

This experimental storefront is custom developed. Therefore, it is important to design this experimental electronic storefront with a proven systematic approach. So, for example, the selection of a logical development sequence should first be chosen. Then the page design and the look, behavior, and attributes of the objects within each page should be designed. Finally, privacy ingredients should be added. Based on this premise, the following stages were set up for the development:

(1) Decide on the number of pages, page names, and page content;
(2) Design screens and add objects for each page;
(3) Define the relationships and hyperlinks among pages and objects;
(4) Establish an outline for the project and a time schedule for its completion;
(5) Acquire all necessary resources for development;
(6) Create the development environment;
(7) Use Microsoft Site Server 3.0, Commerce Edition to build a prototype of electronic book store;
(8) Use Microsoft Visual InterDev 6.0 for customization;
(9) Test and modifying the project;
(10) Present the project for feedback.

DISCUSSION AND CONCLUSION

Concerns about privacy are not new, but they often arise when new information technologies with enhanced capabilities for collection, storage, use, and communication of personal information come into play (Webster, 1998; Milberg et al., 1995; Culnan, 1993; Clark, 1988). In today's e-commerce, web sites must be used to gather personal customer information to be able to communicate or transact business, and it seems that the same web site should be used to insure the customer about privacy concerns. This is especially true in an area of privacy concerns where acts of personal data intrusion may be widely publicized and will surely make the general public more aware of what may happen with their personal data. Such intrusions place additional pressure on the Web site provider to address privacy concerns. The emphasis here is to provide a research-based method to develop a prototype web-based site to sell an education product and at the mean time to respect customers' privacy. The context can obviously be expanded to other domains, but the techniques suggested herein should remain fairly constant for sites that are fully customized.

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