

Commerce on the Internet

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Yes, here is yet another article on the World Wide Web. However, this one focuses on using the WWW to support commerce—electronic marketing and digital publishing.

Use of the WWW is growing at an incredible rate. Current estimates indicate that more than two million WWW viewers have been distributed, the vast majority being NCSA Mosaic, according to Pitkow's "WWW User Survey—General Results Graphs" (<http://www.gatech.edu/pitkow/survey/survey-1-1994/>). This growth parallels that of the Internet, with most new users originating from the commercial and home sectors. The WWW and tools such as Mosaic allow these new users to explore a wide range of information in the form of text, images, audio, and video. From a technological perspective, the increases have been facilitated by availability not only of Web servers and viewers, but of compatible protocols (transmission control protocol/Internet protocol, or TCP/IP) implemented on inexpensive Apple and IBM PC platforms. Additional protocols such as the serial line Internet protocol (SLIP) and the point-to-point protocol (PPP) support home connectivity by enabling TCP/IP over dial-up serial connections. Unfortunately, many of these applications—notably Mosaic—have limited value over low-speed connections, becoming viable at high-end modem speeds (14.4 Kbps). Bandwidth-constrained or not, millions of users access the Web.

These customers—and the potential for millions more—are serving as a testing group; the size of the market is driving the development of interactive electronic marketing materials. Ultimately, Web marketing pioneers will profit from their experience when high-speed (greater than 1.5

Mbps) connectivity arrives in the home, as some local cable-TV companies currently promise, creating an enormous home market. Eventually, consumers will easily access on-line services via future TV/computer hybrids.

This column outlines the promise and the pitfalls of some current strategies for electronic retail and digital publishing on the Web.

Business scenarios on the Web

We all get retail catalogs in the mail; some of us receive more than five every day. We sometimes browse them quickly, but usually toss them or collect them for future reference. Well, the digital analogue of this activity is now increasingly occurring on the Web, although within the rules of acceptable use. Much like the conventional mail-order model, you can ask to be on a mailing list to receive announcements. Such a list can serve to keep customers aware of new products and services. However, the electronic service has many advantages over conventional mailing lists, including low entry and operating costs, and the ability to accommodate bidirectional communications between the advertiser and the customer.

Digital publishing is another commercial pursuit springing up on the Web. In this context, digital publishing is the production, maintenance, and distribution of content on the WWW that is not specifically intended for printed form. Publishers are using the WWW to store and deliver copyrighted electronic books and newsletters.

The tools used are, of course, the various implementations of WWW servers (CERN, NCSA), clients (NCSA and many commercial implementations), and the associated viewers (xv,

mpeg_play, and ghostview, for example). Most of these are available from the public domain for individual use, though not for resale. With this limited toolset, many interesting capabilities exist for electronic commerce and marketing: digital publishing (newsletters or magazines), brochures, product demos, restaurant menus, current events, store-fronts, and mail-order. There are numerous benefits to this business use of the Web:

Updates. An electronic catalog or newsletter can be updated at any time. This allows retailers to change product prices on the fly, add or remove products at any time, and save the cost of catalog printing and distribution. Moreover, the data can be centralized, permitting single-copy updates that immediately apply to all customers. Maintenance is simplified, and materials can get on line quickly and can originate from real-time sources.

Entry cost. The entry cost is relatively low for access to a very large audience. Establishing Web servers is becoming a lucrative business, and many providers offer construction and maintenance services. At the same time, the distribution channel—the Internet—provides access to millions of users, which steals the distribution advantage possessed by large, wealthy companies.

Printing and distribution costs. Distributing electronic junk mail is far less expensive (if not less painful to receive) than printed catalogs and journals. The benefits to the environment are obvious in the decrease in paper and energy consumption.

Multimedia. Retailers can provide product demonstrations and extensive detail without added distribution costs. For example, an on-line catalog can show many views or colors of a product or provide full-motion video/audio to describe the workings of a product.

Interaction and automation. Consumer interaction with the electronic catalog or journal can be extensive, including the ability to order products or subscriptions on line. These interactive services can be entirely automated to save operator costs.

Customer behavior and feedback. Interactive documents and feedback forms can be used to collect data on user demographics and behavior. By

designing interactive materials, sellers entice customers to return to a site. Because bidirectional communication can be readily supported, commonly asked questions and user behavior can be tracked and accommodated to provide a better, more efficient service to the customer. Moreover, retailers can correlate an individual's profile with the observed access to the data.

Customer profiles. On-line services can incorporate customer preferences and use history, such as past purchases or chapters read, to provide a personal environment to the customer, saving access time.

Searching. Consumers can use computer-based searching techniques to quickly locate products and to shop for competitive prices on a single site or across many sites.

Customer preselection. Customers who visit a site qualify themselves. They have sought out a product or service and can receive a more focused form of literature than mass-market approaches such as broadcast commercials.

Many commercial organizations are extensively using the WWW for marketing. Some examples include

- CommerceNet (<http://www.commerce.net>)
- Fidelity Investments (<http://www.fid-inv.com>)
- Internet Marketing (<http://cybersight.com>)
- Internet Shopping Network (<http://shop.internet.net>)
- Pizza Hut (<http://www.pizzahut.com>)
- Sun Microsystems (<http://www.sun.com>)
- Quadralay (<http://www.quadralay.com>)

Interaction is the key

Critical to the successful application of WWW technology are fostering repeat customer visits and managing the flow of information to and from the customer. Many Web sites use an exciting and dynamic opening graphic in an attempt to hold a customer's interest long enough for the sales pitch. However, for repeat customers, retailers need to provide some kind of value-added ser-

Figure 1. Through interactive forms, a company can build a database of customer information.

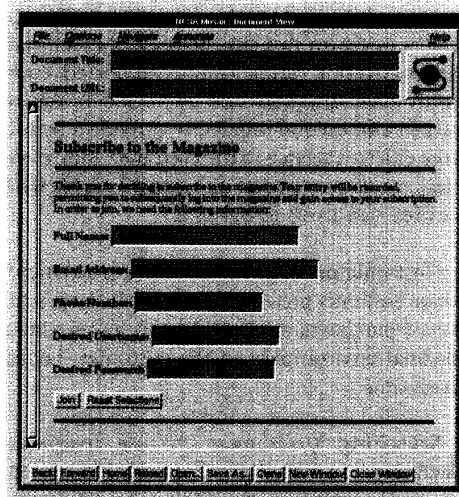
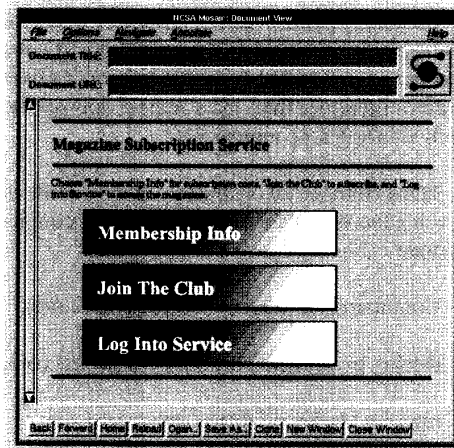


Figure 2. An on-line magazine's welcome page can point customers to subscription information, subscription forms, and the content itself, among many possibilities.



vice in the form of useful information or services, searching capabilities, or incentives.

Forms

Interactive forms (Figure 1) on WWW provide entry fields, radio buttons, and pull-down options. These simple components allow service providers to build interfaces into the content of a Web server to provide access to sophisticated custom programs. For example, a customer might, through an interactive form, indicate current age, number of children, expendable income, and home value to identify investment options for a mutual-fund buying service. Using that information, the service might steer the customer to performance indices that help in choosing investments.

Forms are being used for other purposes too. Many registration services, such as Web server registration, use forms to collect data in a standard format. This process can be automated to immediately post new server content on line. This technique is being used for registration at technical conferences and for "reader service" cards.

Another technique used on the Web to support electronic advertising in on-line magazines is to offer an incentive to interact with the service. This incentive can be an on-line reward (such as an article, movie, or access to real-time newsfeeds), delivery of a physical product sample, or entry into a contest. In contrast, a more conventional advertising technique is to force the material to be seen by mixing it with articles in an inseparable way, as we see in television, newspapers, and magazines. The more interesting approach is to offer customers an incentive to read or interact with advertisements.

Once interaction is supported, data on individuals can be maintained both by direct customer involvement (for example, updating the name and mailing address) and by monitoring the documents accessed. A personal profile can capture basic demographics as well as individual information and environmental preferences. This information can be used for a number of interesting purposes, including

1. to configure the interface presentation,
2. to fuel Web "agents" who actively search the net or site based on the profile, and
3. to tailor and select site-specific information to present to the customer (for example, showing children's ads to children and adult-oriented ads to adults).

All of these activities can be performed dynamically on a Web server.

As an example, Figure 2 illustrates a hypothetical WWW subscription service to an electronic magazine. The opening menu provides a map to the magazine and its subscription process. "Join the Club" permits a customer to subscribe on line by interacting with the Web site and, potentially, to authenticate a credit card as payment. Subsequently, the customer can connect to the magazine via "Log into Service" (Figure 3) with a username and password.

This example illustrates one of the most significant benefits of Web technology: The manage-

ment of individual customer accounts and requests can be automated through user interaction with the content, providing a high degree of control with low overhead. This automation can also monitor and track customer behavior for billing and for developing more effective marketing solutions. Other methods of automation can provide automatic responses to customer queries based on forms, notification of new products via e-mail, and other services.

Protecting property rights

Traditional publishers fear they will lose revenue when publications are put on the Web, because the Web facilitates uncontrolled data replication without financial compensation. Such replication is certainly possible, but often mitigated by the following:

1. Sometimes the publications are *intended* to be widely replicated and distributed, as is the case with announcements, PR materials, and brochures. Widespread replication then becomes a bonus.
2. Data are often time-dependent and lose value with time, such as news, weather, and market studies. (This is also true for most software.)
3. For artworks, low-resolution images can provide a hint of the true piece, whether music, film, sculpture, or portraiture, that entice a customer to subsequently order a high-res image or physical copy delivered via another medium.
4. Content separated from custom interaction features can have little or no value.

The current strategy for limiting access to paid-subscription materials is to provide password access to the content. Access can be billed based on number of accesses—to discourage subscribers from giving away their passwords—or on a flat rate per month. (Connect time is irrelevant for a connectionless service provided by a Web server). Furthermore, a publisher can develop charges based on the amount of detail the customer extracts: For instance, a publisher could charge per chapter of a book read. All of this is possible because of the ability to monitor a customer's behavior and charge accordingly. Several additional duplication scenarios are worth considering further.

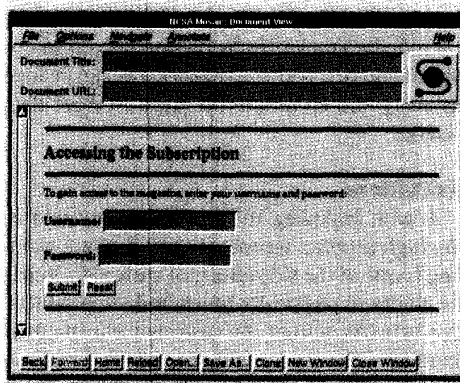


Figure 3. On-line publishers can support paid subscriptions by assigning readers a username and password.

Duplication scenarios

Suppose someone copies the contents of an electronic book to their local computer. They would obtain all of the contents but would lose the interactivity and the infrastructure for its delivery. This is analogous to cutting the spine out of a book and removing all of the page numbers, the index, and the table of contents, and separating the figures from the text (assuming the electronic book has been prepared properly). Reproducing the electronic book would require significant effort, like reproducing a printed book does, but would not be impossible.

Suppose someone gives a valid password to a colleague in a manner analogous to loaning a magazine. This activity could be detected as a new combination of username and originating computer IP address; the publisher can then either prevent such activity or encourage it as a good means of advertising. Further, if the same username-machine name pair accumulates a high number of accesses, the publisher can suspect password distribution and suspend the account. The right approach depends on the overall publishing objectives.

Benefits of electronic publishing include the fact that the electronic book, journal, or sales brochure takes up no shelf space. If a customer does need a hard copy, WWW tools support the generation of printed documents at the customer end. Finally, on-line publishing makes custom reprinting easy. Want that old article on ski resorts? Go to the Web site and search for it. The Web server is always there.

CD-ROM versus WWW

Don't bother with CD-ROM. As a delivery medium, it is slow and static, with a significant

design-to-distribution time. CD-ROM technology will soon be supplanted by high-speed communications and rich-content archives that can change instantly and eliminate the need to store data locally.

Limitations

As with anything, the WWW has limitations. The high product return rate of TV home shopping is one of the side effects of customers losing the ability to physically touch and see products. This benefits neither the customer nor the merchandiser. The service end can only automate so much user interaction; you still need someone to answer the phone and provide customer service. Also, poorly designed automation can have ill effects; for example, a defective mail robot can irk an entire customer base by erroneously replicating and distributing product announcements. Finally, the explosion in electronic distribution of promotional materials via e-mail diminishes its value as it moves toward junk-mail status.

Another problem is that creating and maintaining useful content requires effort and expense. Most Web servers, both commercial and non-commercial, rely on relatively static information content. Commercial sites commonly translate promotional materials such as brochures, maps, and product literature into HTML-compliant documents suitable for browsing. On-line journals and magazines post recent articles to encourage browsing on their sites. The challenge is how to maintain this information as it changes over time with minimal effort.

Servers are relatively straightforward to set up, as evidenced by the number currently on line. Developing highly interactive services, however, can require significant development efforts tai-

lored to an application domain. In all cases, the ability to attract and keep customers depends on the quality of the offered services and products. Maintenance and operating costs depend on the frequency of content changes and the amount of bandwidth consumed in content delivery.

Conclusion

Businesses are increasingly using the Web for advertising and electronic catalog-based retail sales. Immediate benefits from the use of the technology include the ability to monitor and track the behavior of one's customers, provided by access statistics the WWW server maintains. In addition, many aspects of managing customer interaction can be automated, for example, submission and collection of customer surveys, billing, and so forth. In the future, more organizations will use the net for innovative ways of providing on-line magazines and electronic commerce. Although the approximately 20 million Internet users represent only a small fraction of the world population, the dramatic growth of the market in recent years will continue to lure commerce on line. **MM**

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