by Jill Barson Gilbert

# Technology—Take It or Leave It

Do you long for calculators, mechanical pencils, engineering pads, and daily planners? Or do you embrace notebook computers, cell phones, personal handheld devices, and automated scheduling software? As an environment, health, and safety (EH&S) professional, do you find technology fast and easy to use, or must you refer to a manual merely to log on to your PC?

Technology has undoubtedly changed our lives. But people do not always openly embrace new technology,

> "Designing the user interface is fundamentally an exercise in compromise… between the drawbacks and benefits of design decisions… Good – Bad = Net Usability."
>
> Source: Padilla, M. User Interface Design—Taking the Good with the Bad; Digital Web Magazine, July 18, 2006; www.digital-web.com

even when it works flawlessly. They may be intimidated by new technology or unwilling to change their ways. To be successful, technology must be intuitive and easy to use; otherwise, it will sit on a shelf gathering dust.

To be accepted and used, technology must have a purpose (specific business objective), it must have the appropriate content (features and functions), and it must be aimed at and distributed to the intended audience (users). Though the relative importance varies from product to product, each new technology must consider four factors: design, performance, security, and usability. Usability is possibly the most important factor in determining acceptance. This column considers design, performance, security, and usability for software delivered via the Web.

## DESIGN

When developing a new Web site, you want it to be attractive and easy to navigate. The visual design should reflect the underlying business objectives of the organization. If your organization is conservative, you don't want overtly flashy, avant-garde designs. Design aspects include navigation, use of color, and use of space. Visual design must consider the impacts on performance and usability. It is better to keep things simple and avoid slow page loads than to overdo it.

Web design should be familiar, using common models such as tabs, tree structures, buttons, and links, and should follow accepted technical standards and best practices, such as those published by the World Wide Web Consortium (www.w3.org), International Organization for Standardization (www.iso.org), Internet Engineering Task Force (www.ietf.org), Ecma International (www.ecma-international.org), Unicode Consortium (www.unicode.org), and the Internet Assigned Numbers Authority (www.iana.org).

## PERFORMANCE

You expect Web pages to load quickly, whether you are entering EH&S incident data or preparing a monthly report. Performance refers to how quickly pages load and the system's capacity for user traffic. Performance issues include connection speed, design, and hardware.

Your organization likely has users with different connection speeds (e.g., dial-up, DSL, cable modem, T2 line). You might require that certain features work both online and offline (e.g., inspection and audit checklists). Simply designed Web pages load quickly, while complex designs may impede performance. Experts recommend that a Web page display no more than eight objects—icons, photos, or illustrations—per page (Metz, C. Top 100 Web Sites; PC Magazine, March 6, 2001; www.pcmag.com/article2/0,1895,184189,00.asp).

Hardware (e.g., servers, data storage, firewalls) must adequately support your user base. You need one framework to support 100 users and another to support tens of thousands of users distributed globally. Content delivery servers can improve performance by storing frequently used icons, graphics, and other content.

## SECURITY

Any application that stores confidential or personal information must be secure. In an EH&S context, this might include compliance data, worker injury and illness data, trade secrets, or legal correspondence. While organizations must provide physical security, such as controlled-access server facilities and special fire suppression equipment, it is application security that impacts user acceptance.

Users should be able to retrieve their information

Jill Barson Gilbert, QEP, is president of Lexicon Systems, LLC. She helps organizations increase business value by designing and implementing EH&S management solutions that leverage technology. E-mail: JBGilbert@Lexicon-Systems.com.

effortlessly whether they are at the office or on the road. Application security uses login IDs, passwords, and often role- and facility-based access privileges. It also includes measures to prevent unauthorized parties from compromising your Web site and stealing your data. Most enterprise applications include an audit trail that shows which user entered or changed data, and when.

## USABILITY

When the term usability was "invented" in the 1980s, it referred to human-computer interaction. Today, with the Internet, instant messaging, Web conferencing, and social networking, usability also affects human-human interactions. This section addresses the former.

Usability is perhaps the top reason that people do not accept and use technology. Users do not readily embrace applications that are difficult to maneuver.

Technology should be intuitive to avoid frustrating users. Users should be able to quickly understand how to use the most important features in the context of their job role. If a user only needs to enter hazardous waste inspection results, then the application should direct them to the form. If an EH&S manager needs only to view the progress of key performance indicators, the application should display this information on a dashboard view or an easily accessed report.

The application should have clear-cut navigation. Users should be comfortable navigating through the application and using its features. They should be able to complete tasks quickly and easily. Data entry forms should be simple, asking for one type of information at a time. If a significant amount of data is required, then users should enter it in logical steps. Users may rebel against complex forms that require a lot of scrolling.

Navigation should be instinctive. The graphical user interface should provide visual clues, such as tabs, icons, buttons, and the use of color and space, that allows users to move instinctively from task to task. Many applications offer automated workflows that guide users through a process. Good usability design alerts people of errors and how to correct them. It also provides help in the form of user-friendly help files and, in some cases, offline help.

When considering a new technology, make sure your organization has a clear strategy and stated objectives. Evaluate the technology to make certain that it fulfills a business need that aligns with your organization's overall strategy. Creating and deploying a new technology in the workforce requires a dynamic balance. The technology's design must fit the target audience and their roles. It must perform at an acceptable speed, with little downtime. It should have security features to give confidence that information is accurate, of high quality, and traceable. And it must be user-friendly. After all, technology acceptance is all about people. **em**