# From the Editor: It's the Network!

In a recent flurry of articles on managing networked or "wired" organizations, writers in popular business and computing magazines have discussed the effects of the new communications technologies on office environments.[1] For most of these writers, the primary benefits of networks are in allowing members of an organization to access and share information more easily. Management and communications theorists see electronic communications as a primary means to transform or "reengineer" organizations and create new organizational structures that are less hierarchical and more flexible.[2] If the increased information flow is useful and useable, it should improve decision-making and increase productivity throughout an organization.

The popular literature on networks tends to emphasize such transformational effects, but a recent *Harvard Business Review* article reports a number of cases where information technologies have failed to produce anticipated benefits.[3] According to the article, this is because those responsible for implementing the technologies have been "constantly caught off guard by the 'irrational' behavior of 'end users.'"[4] Many organizations do not put enough thought into how people actually use information before encouraging or requiring them to rely on the network for information access and communications. In particular, organizations fail to pay enough attention to the following factors:

1. *Most people don't rely on computer-based information to make decisions.* "Most of the information in organizations—and most of the information people really care about—isn't on computers."[5] Even with

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1. *See, e.g.*, Michael J. Miller, *The Changing Office*, PC MAG., June 14, 1994, at 112; Thomas A. Stewart, *Managing in a Wired Company*, FORTUNE, July 11, 1994, at 44; John W. Verity, *Introduction*, BUS. WK./THE INFORMATION REVOLUTION 1994 (special issue), at 12.

2. Networked communications make it easier for an organization to create flexible, problem-solving teams to resolve problems and complete projects. With a network in place, such teams can be easily configured and disbanded as needed, can communicate without scheduling face-to-face meetings, and can include participants from outside the organization. *See generally* MICHAEL HAMMER & JAMES CHAMPY, REENGINEERING THE CORPORATION (1993); DON TAPSCOTT & ART CASTON, PARADIGM SHIFT: THE NEW PROMISE OF INFORMATION TECHNOLOGY (1994).

3. Thomas H. Davenport, *Saving IT's Soul: Human-Centered Information Management*, HARV. BUS. REV., Mar.-Apr. 1994, at 119.

4. *Id.* at 119.

5. *Id.* at 122.

network communications installed, people continue to receive information from face-to-face contacts, via the telephone, or in printed documents. It is easy to overemphasize how much importance actual users will place on electronic information sources simply because the information is available in that form.

2. *People don't share information easily.* Presumably, among the major benefits of a network are its facilitation of file transfer and shared access to information. Yet, while many administrators see immediate advantages in creating "cradle-to-grave" administrative systems, staff members may take proprietary interests in what they consider to be their own data, fearing its corruption if others use it or simply a loss of power if others have access to their information.[6]

3. *Electronic communications can be overused.* The ease of communicating over the network adds to complaints of information overload. Most users actually face too much "noninformation"—the unfiltered onslaught of communications that are not useful, but must still be sorted through before that determination can be made.[7] E-mail exacerbates this problem because it makes it easy for anyone on a local network or Internet discussion group to broadcast FYI correspondence, "junk mail," and extraneous discussion threads to all participants. The benefits of widespread information-sharing can be easily lost if users are pelted with information they do not wish to see and if their work is interrupted by a seemingly endless stream of notification messages.[8]

What impacts do network technologies have on the law library's organizational role?[9] In a traditional library-centered information environment, characterized by local purchase of discrete and stable units of mostly

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6. It is important for an organization to understand its preexisting information culture: If the culture does not already encourage sharing of information, the network alone will not change things. Case studies reported in the *Harvard Business Review* article indicate that relationships of trust and acceptance must be established through face-to-face meetings before e-mail can be effective as a means of organizational communication. In part, this is because of e-mail's imperfections as a communications tool (inability to convey nuance, body language, etc.).

7. Davenport, *supra* note 3, at 126. See also G. Pascal Zachary, *It's a Mail Thing: Electronic Messaging Gets a Rating—Ex*, WALL ST. J., June 22, 1994, at A1, for examples of overuses and non-business-related uses of e-mail in organizations, and limitations imposed on responses.

8. The literature describes ongoing efforts to develop personalized filters that will allow e-mail users to screen out unwanted communications. Until these are perfected, organizations probably need guidelines on e-mail usages. At least one law firm maintains a special internal mailing list called "junk mail," to which staff and attorneys can choose to subscribe. All general non-business communications are sent only to users on this group.

9. For a strongly stated vision of the importance of networks to legal education, see Interim Report of the University of Dayton School of Law and Mead Data Central Joint Committee to Study Computer Technology in Legal Education (Aug. 1993).

printed information, librarians play a primary role. They obtain information, organize it for use, and make it accessible to local users. Traditionally, this is accomplished through a locally generated card or online library catalog, supplemented with indexes purchased by the library to provide access to some materials (journals, microfiche sets, etc.) at a level of detail greater than the individual library can afford to provide through its own efforts.

In a networked information environment, the network itself provides immediate access to virtually unlimited (and often unknown) bodies of local and distant information (and noninformation). Some electronic information arrives on the desktop as local or Internet e-mail, or from participation in electronic discussion groups, whether or not it is wanted and requested. Additionally, a growing amount of useful legal information can be accessed from computers at remote sites throughout the world, provided that one knows that the information exists and how to access it.

Because electronic information can be altered or removed from a network site without warning, creating means of access to it is more problematic than for print materials. The prospective cataloger of digital information products is shooting at moving targets, which might disappear as soon as they come within sight. Yet, as long as the sources of legal databases were stable and limited, it was possible to think of capturing information about legal databases within the library catalog.[10] Mead Data Central and West could be expected occasionally (and without notice) to alter the contents and change the names of the files contained in LEXIS and WESTLAW, increasing the difficulties of maintaining current records in the catalog. But (without minimizing the special problems posed by electronic titles), these matters could be viewed as particularly troublesome manifestations of the already well-known problems posed by the cataloging of serials titles. In 1987, when the RLG Law Program Committee began its cataloging project, Mead Data and West were the two stable and responsible suppliers of nearly all electronic legal information.

In 1994, the information environment is significantly more complex. LEXIS and WESTLAW are no longer the only sources of electronic legal information, and law librarians and end users alike are without a model for organizing and accessing the information available through the desktop terminal.

A networked user's concept of information quickly extends beyond the books and other print sources held in the library. With so much informa-

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10. *See* Gail M. Daly, *Library-Vendor Cooperation in Cataloging Legal Research Databases: The Minnesota/WESTLAW Experience*, 82 LAW LIBR. J. 331, 333-35 (1990).

tion directly available electronically, the networked user's primary point of access to information is not the library, but the desktop personal computer: library materials and the commercial legal databases make up only part of the information universe. Increasingly, users will consider other types of information to be as useful and important as the more formally published information received through the library. Legal information held at local or remote Internet sites will be indistinguishable in users' eyes from that located through LEXIS and WESTLAW.

As a networked user's definition of information expands beyond library-based materials, the primary means of access to that information is the network interface (a menu or program group on a computer screen). Like the library catalog, the network interface is an organizing device for local users—a means to help local users locate and obtain information. The organization and design of the interface is as important for effective access to networked information resources as cataloging principles are for access to materials indexed in the library catalog. Librarians concerned about access to information within their organization should not leave the development of the network interface to chance. Rather, they should seize it as a new opportunity to put their skills to use, whether or not the law library has overall responsibility for network development. The following areas are of particular importance.

1. *Selection of the information resources that will be most directly accessible to users through the network menu.* In the current network information environment, as in the traditional library-based information environment, someone must be responsible for determining which electronic information sources are most readily accessible. It is not enough simply to make the world of electronic information available to a local community. Skillful selection of resources to meet the needs of local users is as important for the network as it is for a collection of library holdings. The librarian's understanding of the information needs of the community come directly into play.

To be effective participants in the network environment, however, librarians must be willing to think about the potential interrelationships among everything on the network screen, including information not accessed through the library and the applications used to manipulate information. In addition to ensuring that LEXIS, WESTLAW, the local online catalog, and CD-ROM databases are easily accessible through the network, the librarian must identify and ensure the accessibility of online journals, newsletters, online discussion groups, electronic course materials, and other resources that meet the needs of local users. It is also the librarian's business to assist in determining what local information

resources (the law school rule book, information about the school, local directory information, etc.) should be mounted on the local network or made available via the Internet.

Once the selections are made and the resources mounted or made accessible through pointers or other devices, it also may be the librarian's ongoing responsibility to verify the quality of information on the network and to ensure that users know which texts are authenticated and which are current.[11]

2. *Design and organization of the network interface.* What should users see when they turn on the computer and begin to work? Regardless of how much useful information is identified and made readily available on the network, accessing it though the network has transaction costs for users. Not all users of a law school, court, or law office network are intrigued or comfortable with electronic information. If the information is in the library or elsewhere in another form, why use the network to obtain it?[12]

Menu design can be thought of as packaging or presentation, but that is not to trivialize it. The importance of packaging to information access is recognized by information designers such as Edward Tufte,[13] and, one hopes, increasingly by librarians.[14] It is not enough simply to know that a body of potentially useful information exists somewhere on the Internet.[15] Without intuitive and easy-to-use tools to locate and obtain networked information, the power of the network will be lost on users who have neither the time nor dedication of information technologists and librarians. It is packaging that creates user-friendly systems and systems that are used. Network interfaces must be designed with the needs of local users in mind. How do people in the organization work? In what order do they want information and applications presented on the network menu? What

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11. *See* Richard A. Danner, *From the Editor: Big Things*, 86 LAW LIBR. J. 185, 189-90 (1994). It is not only librarians who are concerned about the quality of electronic legal information. *See* Tom Bruce, Peter Martin & Will Sadler, A WWW Manifesto 12-13 (May 1994) (paper distributed at the 1994 CALI/LEAP conference).

12. *See* Davenport, *supra* note 3, at 122, and text accompanying note 5. Consider as well the recent report that, despite widespread access to the Internet (an estimated 20 to 30 million users worldwide), relatively few with access actually make regular use of Internet resources. *See* Peter H. Lewis, *Doubts Are Raised On Actual Number of Internet's Users*, N.Y. TIMES, Aug. 10, 1994, at A1, C4.

13. "The key thing in judging an interface . . . is not the features but the *access* to the features. Sure the features exist, but do they exist as far as most users are concerned?" Jimmy Guterman, *Envisioning Interfaces*, WIRED, Aug. 1994, at 60, 61 (quoting Edward Tufte).

14. In her keynote address at the 1994 AALL annual meeting in Seattle, Toni Carbo Bearman noted the importance of organizing and packaging information for local users.

15. "That's the great fallacy of the Internet. . . . People think you can put information out there and everyone who cares about it will look at it. But a lot of people don't realize they care about certain information." David H. Freedman, *The Schank Tank*, *Wired*, Aug. 1994, at 44, 50 (quoting Alex Kass).

applications and information sources should be grouped together? It is easy for those intrigued by the technology to overestimate how much playing and customizing busy law professors, attorneys, and judges wish to do and how effective they will be before frustration sets in. Windows interfaces allow individual users great flexibility in setting up their own program groups, but not everyone will take the trouble to do so. A model menu linking and grouping standard applications and information can be helpful, even for those who may wish to customize.

Do librarians bring any greater skills to the task of creating easy-to-use, intuitive network interfaces than do information technologists? Given what we have been willing to accept on behalf of our users in the design of the public interfaces for most online catalogs, the answer would seem to be *no*. Still, law librarians' experience working with a specialized group of users should create the ability to articulate the perspectives of legal information users in matters of interface design.[16]

3. *Development of comprehensive search and delivery mechanisms.* The constantly expanding and changing variety of networked information resources cannot be brought under anything resembling bibliographic control through the library catalog or any other single indexing device.[17] This is less a result of the difficulties of electronic formats[18] than of the massive changes in the ways that information can be distributed and the newfound abilities of almost anyone to create, publish, and distribute information via the Internet. If it is no longer reasonable to try and force everything into the catalog, what can be done locally to allow users to perform comprehensive searches for information?

One answer might be found in the user-centered, but library-based, model for future document delivery services presented in a paper by Terry Martin and Curtis Kendrick.[19] Martin and Kendrick present a scenario for

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16. When librarians have taken initiatives in interface design, their efforts have proven successful. See, for example, the attention attracted by the library-based and -constructed gopher server at North Carolina State University. John E. Ulmschneider, *The NCSU Libraries' Gopher*, FOCUS, no. 3, 1994, at 9; Eric Lease Morgan, *Carving a Path through the Gopher Maze*, FOCUS, no. 3, 1994, at 11.

17. *See* Gail M. Daly, Bibliographic Access to Legal Research Databases Reconsidered 16 (1994) ("If librarians still seek to make the traditional public catalog the comprehensive finding tool for all resources available in that library, their task will be impossible.") (unpublished manuscript submitted to *Law Library Journal*).

18. "Librarians, after all, have had to adjust on a regular basis to new formats (video, sound recordings, microforms, etc.), all of which have been integrated successfully into traditional catalogs (whether online or card-based)." Diane I. Hillman, *Cataloging the Internet: Why Bother?*, CORNELL L. LIBR. NEWSL., Apr. 1994, at 6, 6.

19. Harry S. Martin III & and Curtis Kendrick, A User-Centered View of Document Delivery and Interlibrary Loan (1993) (available via the Internet on the Association of Research Libraries gopher).

document delivery service in which the library acts as an almost seamless interface between a university scholar and the information that she needs. The paper shows how a Harvard faculty member could use a networked terminal in her office to search for and arrange delivery of a range of articles and other materials through the campus library information system. For the user, it is largely unimportant whether the materials are held at Harvard or remote locations. She would simply select a number of appropriate locally mounted, remote, online, and CD-ROM databases (the Harvard catalog, catalogs of other libraries, databases like RLIN, and index and abstracts databases) to search, then use special software to run a single search through all the selected databases.

For users to conduct successful, comprehensive searches of networked information, there must first be developed search engines that will run seamlessly and simultaneously across a predetermined set of selected databases. This, however, probably will not be enough to cover all potential sources of useful information available via the Internet, nor will it avoid bringing a searcher massive amounts of useless "noninformation" along with the useful data the search should retrieve.

Many librarians see the problem of information overload and noninformation as a basis for the future survival of their role and profession. Certainly, it is true that, at least in the short run, the "navigational" skills of expert searchers will be in high demand. Doubtless, end users will always need intermediaries or "agents" to help them find, retrieve, sort, and evaluate potentially useful information found on the network. But it is far from clear that this function must forever be performed by human intermediaries navigating the Internet to locate information for less-skilled, busy, or disinterested users on a case-by-case basis. The increased flow of undigested information to the desktops of network users has spurred interest in "agent technologies" to perform the intermediary tasks. As put by Nicholas Negroponte of the MIT Media Lab, "What I really need is intelligence in the network and in my receiver to filter and extract relevant information from a body of information that is orders of magnitude larger than anything I can digest."[20] Negroponte and others look to technology, not to librarians, to act as what he calls "interface agents."[21] Yet, the need to evaluate information for researchers and other users should not be a new issue to librarians supporting research

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20. Nicholas Negroponte, *Less Is More: Interface Agents as Digital Butlers*, WIRED, June 1994, at 142, 142.

21. *Id. See also* David H. Goodstein, *Scriptwriter*, WIRED, July 1994, at 50, 52 (comments of John Warnock, inventor of PostScript, on agent technology); Rick Tetzeli, *Surviving Information Overload*, FORTUNE, July 11, 1994, at 60, 64 (comments on Negroponte).

operations. The librarian's expertise in developing user profiles and SDI services to anticipate research requests and to filter out less useful information should make a major contribution to the development of agent technologies.

In his recent *New Yorker* article decrying the demise and destruction of the card catalog, Nicholson Baker concluded that card catalogs should be preserved because "they hold the irreplaceable intelligence of the librarians who worked on them."[22] One can debate the merits of Baker's arguments regarding the card catalog, but he is correct in his emphasis on the human element in the design of effective means of access to information. In the networked information environment, librarians can apply the knowledge of their field to create and improve network access to new and old forms of information alike, even though they will need to develop new technical skills to apply that knowledge. Network interfaces and other means of access to information must be devised, not only with technology, but with an understanding of how people use information and how best to present it to them.

Richard A. Danner

22. Nicholson Baker, *Annals of Scholarship: Discards*, NEW YORKER, Apr. 4, 1994, at 64, 86.