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Defining "It": NREN's Opportunities for Librarians

ABSTRACT

Various aspects of the National Research and Education Network (NREN) are discussed. Legislation currently under consideration is characterized by a focus on the research community to the exclusion of other potential user communities and is also characterized by a low level of federal funding. Librarians have already played a role in changing the focus of the proposed network and need to continue this effort. Other issues discussed include defining when the Internet evolves into the NREN, who will have access to the network, what will be accessible on the network, and who will pay for access to the network. Finally, the role of the librarian in a leadership capacity in the implementation of the network is discussed.

INTRODUCTION

In recent months, the opportunities stimulated by Senator Albert Gore's (D.-Tenn.) vision of an information highway for the nation have caused many people to have visions of free access to all information for all people, in this country and in others. In March 1991, the Coalition for Networked Information met, followed immediately by the EDUCOM National NET'91. Coming from those two meetings was a clear sense that although progress is being made, no one really knows what "it" is; that is, what the National Research and Education Network (NREN)

really is or will be. Given this situation, we may not even know when it comes into existence. We think we know the general direction that the information society is going, and because we are a profession concerned with the access to and management of information, this phenomenon is going to be critically important to us. But we can only begin to guess what the landscape will be like, who the stakeholders will be, and suggest in what ways we might contribute to and participate in the national network.

What are some of the issues at hand that we need to recognize? There are a host of rather difficult questions to address; some will have to be addressed by the library community alone, whereas others should be addressed in concert with those communities (academic, administrative, computing) that have already chosen to ally themselves with us in the pursuit of this vision.

LEGISLATION

Legislation, which librarians thought well in hand, continues to be a problem. At this writing, Senator Gore's bill, apparently noncontroversial and ready to go last year, is not safely tucked away with the sufficient number of votes. He has reintroduced his bill, and there is a companion House bill, but there is also a bill being put forward by the Senate Energy Committee because of its lack of satisfaction with the Gore bill. In addition, the whole education community is working with the Senate Labor and Education Committee to attempt to bring to the fore some information policy issues that remain unaddressed by the Gore bill.

When Gore's bill was reintroduced in February 1991, the Congress was challenged by the administration to pass it within one hundred days, which would have been some time in May 1991. The good news is that there is bipartisan support for the bill and no serious disagreement between the White House and Congress, although White House Science Advisor Bromley apparently believes that this can be an administration effort alone with no assistance required from Congress. This relatively minor point alone seems insufficient reason to derail the legislation.

The bad news is that some, including voices from the library world, are questioning the advisability of a piece of legislation that envisions a network focused primarily on the research community. The Senate Energy Committee has its own agenda. It is unhappy with the governance structure suggested by the bill and believes that the provisions of the bill will not adequately support the national security, access, and governance concerns of the Department of Energy. Governance is only loosely addressed in the Gore legislation. As it turns out, the library

community shares the concerns of the Senate Energy Committee and for a very understandable reason: each group believes that as the statute is currently designed, its own vested interests will not be seen as critical in the administration and operation of the network.

For example, the management structure as envisioned by the administration is a Federal Networking Council composed of the National Science Foundation (NSF), the National Aeronautics and Space Administration, the Department of Energy, the Department of Defense, the Environmental Protection Agency, the Office of Management and Budget, the Office of Science and Technology Policy, and a few other federal agencies perceived by the Senate Science and Technology Committee as operating programs requiring network support. This council is to be subdivided into working groups and supplemented by an advisory body that has on it representatives from the Library of Congress, the National Library of Medicine, and the National Agricultural Library, among other federal agencies. However, this council, with its policy-making power and its advisory council, is not included in any legislation. Which governance structure will prevail? And how will the nonfederal sector participate?

The Senate Energy Committee may suggest various options for governance, among them a national networking council, a nonprofit corporation analogous to the Corporation for Public Broadcasting, the Federal Networking Council, or the FCCSET (the Federal Computer Council for Science, Energy, and Technology). Any one of these, they posit, could oversee "it"—and let me remind you here that it is still unclear what "it" is. Is the network something that stands alone, is clearly identifiable, and can be governed by a single body? Only a few months ago, IBM, MCI, and Merit joined together to form a not-for-profit organization, ANS, that would implement and operate the NREN. They are not alone in looking toward the increasing desire to network as a source of profit.

The network exists already, is in use, and there is a large and growing customer base already accustomed to having access to certain facilities through the network at a cost that is generally absorbed by institutional budgets. With the NREN governance structure as proposed, there is the advantage of presumed continuing federal support and the promise of wider access to a publicly held program, but these are assumptions and presumptions. The legislation still leaves too many important decisions up to a small group with relatively narrow interests, and it also represents a low level of federal dollar investment.

The dominance of federal agencies in the legislation, and therefore in the way we tend to perceive the structure today, is not comfortable to many. Remember that the name of the legislation is the High-Performance Computing Act of 1991; it is not the National Research

and Education Network Act. The NREN is only one part of the legislation, which is based on a long-standing relationship between government agencies and university science and technology research. From the perspective of the federal government and its agencies, the purpose of the network is to better enable communication between federal employees and federal government contractor scientists. The fact that the rest of the university community has acquired access to this network is not recognized by either the administration or Congress, and this will remain the case until librarians begin to demand characteristics, performance, and costs that are unforeseen by the science-oriented agencies and the drafters of the various pieces of legislation. The existing network structure is governed in large part by the NSF and includes regional networks, which are important to the current operations but which are totally ignored in the legislation. These regional networks are closer to the users of the network, are more diverse, and are not totally federally funded, but they represent the investment of state funds and institutional dollars. The proposed governance places all the voice in Washington, which is not necessarily where it should be.

As the American public learns of the network, there will be a sufficient outcry that the governance structure and concomitant issues will have to change to meet the outstanding needs. With libraries' legislative support and contacts, librarians are in an eminently suitable position to talk to their representatives in Congress about the desirability of creating a network that can serve more than just the scientists of this nation.

THE E IN NREN

The E in NREN stands for Education. It was not always there; in fact, librarians played a prominent role in causing the E to appear in NREN. Before early 1989, it was just the National Research Network—designed to support scientists in their contractual work with federal agencies.

The E was put into NREN, but is it more than just a sop? We need to better determine our role in the development and implementation of this network. We have to tell Congress and the public why the E is in NREN, and what it means for the network and for the population of this country. We have not done that very well yet but seem to have sat back on our laurels, having done the alphabetically difficult task of inserting the E. We have to follow up by convincing Congress, federal agencies, and our colleagues that this is an essential capability for schools and libraries in enhancing the productivity and education level of the

nation. It is almost as though the creators of the concept allowed us to have our way by inserting the E, but nothing else has really changed. And that is unacceptable to me; it should also be unacceptable to you.

What is the library community's role, then? One obvious one is to continue to lobby Congress, directly and through our professional associations, to urge them to accept this conceptual change and to regard the network as the beginning of a nationwide communication system that will have as much impact as the telephone system, if not more. The benefits of the system need to be described more precisely and should balance public good and private gain. I once talked with a senator who was totally enraptured by the concept of a ten-year-old boy in a rural area of his state being able to communicate with and learn French from someone elsewhere in the country or even in France; we need to develop realistic visions of how the network will be used by the public, and why it will be good for the country.

Also concerned are the publishers and other for-profit organizations, with copyright, intellectual property, and the profit-making issues as motivating factors. This is particularly important because Congress and the White House have made the assumption that NREN will ultimately move to the private sector. If this network is going to be a vitally important tool for the nation, who will pay for it? Just as some are making an analogy with a supposedly free highway system, there is an analogy with the telephone system that we have constructed in this country. Assume that the Gore bill passes and that funds are appropriated. The funds will be used for research, for the overhead needed to coordinate the network, for a "directory" of resources on the network, and for special grant-assisted projects. *Government funding will not support the routine operation of the network.*

What can the average person, or the average library, assume that he (or it) will gain from the passage of the bill and the appropriation of funds? Equipment? No—that is a local cost, unless someone successfully writes a grant proposal for a project that addresses some activity described by the bill. Communications costs or cabling? Unlikely. First of all, most of the country is already networked; the funding in the bill will go toward the research necessary to develop higher speed networks and not toward the implementation and operation of these networks.

Most important for librarians will be the cost of accessing information on the network. Later in this paper, I will address in more detail what resources are likely to be on the network. For now, let me suggest that the appropriate model for libraries is a mixed economic model. With the exception of "free" information such as library catalogs, conferences, and electronic mail, much of the benefit of the network will result from accessing databases held by the private sector. Right

now, libraries pay differently for online databases, generally linked to the nature of the original publisher of the database. In turn, libraries make a determination about how the costs will be passed on: in some institutions, full cost recovery, both direct and indirect, is implemented; in others, the library subsidizes all online searching; most of us are somewhere in between. With the NREN, I suggest that database publishers will not make their information available through the network until they can be assured of compensation for access to those data. As opposed to being a "free good," NREN access may merely facilitate access to increasingly higher cost information.

WHAT IS "IT?"

The Internet exists. It is a network of networks and institutions evolved from the NSFNET and governed by a group of peers. Most of us in academic environments have access to BITNET, a network of academic computing facilities; this has evolved in many instances into access to the Internet as well. It seems quite clear that NREN represents the next stage of evolution of this nationwide and worldwide network. There are, however, some amazing ambiguities and a very fuzzy border between today's Internet and tomorrow's NREN. It may not matter very much what the distinction is between the two, but the fact is that people perceive a difference, and, as they say, perception is all-important.

When does NREN become NREN? Some of the possibilities include the following:

1. when the Gore bill passes;
2. when legislation is not only passed, but funds are appropriated;
3. when a gigabit network exists;
4. when NSF or OSTP (or some other federal agency) says so;
5. when a governance structure is in place.

Even the experts admit to being confused about this question. Some are beginning to say that it does not matter because the NREN will be just a small portion of an evolving national network that will come into existence over the next few years. Peter Likins (1991), president of Lehigh, said at National NET'91 that he sees NREN as an academic precursor for a *broader private telecommunications infrastructure for this country*.

Let us frame the question differently: when the Gore bill passes and is funded, will it make any perceptible difference for libraries? I suggest that it will make a difference, but that we will not notice it because the bill, and NREN, are part of the evolving network scene

that we are already engaged in. Instead of focusing on NREN, we need to decide what we, as a community, want to provide our users from the nationwide network that may or may not be NREN.

ACCESS

Instead of trying to decide, then, when Internet will become NREN, let us look at the kinds of capabilities we, as research and academic librarians, want for ourselves and our users. In a word, we want *access*. In the best of all possible worlds, for librarians, we would have free, unregulated, and unlimited access to as much information as is reasonably possible. And we want equitable and relatively low-cost access. Equitable means that whoever seeks information should be able to get whatever information is available on the same terms as any other person seeking that information. This is putting into practice Jefferson's ideal of a democratic society. There should be no distinction between information seekers on the basis of income, education, or other place in society. That is a very general statement and is subject to all kinds of protest and caveats, but as a whole, this is the ideal world. Given that, librarians should start out with that operating assumption and only give up the ideal when forced to by necessity or by compromise. Clearly this means expanding our interests beyond the academic community. Low cost is an ambiguous term, but again it attempts to convey a principle and a reality: the principle is that if people do not need to pay, they should not have to, and the reality is that information, like everything else, costs money.

Librarians want access to the network by the entire education community, from kindergarten to the postgraduate and research community. This vision evokes the national network concept. Some would say "Kindergarten? Are you serious?" But there is a community of interest lobbying for access to the network on behalf of all schools and teachers in the United States. After all, if we are to have a productive citizenry, should not children have access to a national network at the earliest possible age? A major question is the matter of cost of access for thousands of teachers and millions of schoolchildren. Is it possible that our society will gradually be willing to use tax dollars to pay for access to the network in the public schools or tuition dollars in the private schools? Institutions of higher education, and their libraries, need to perceive that access to the NREN by the K-12 population will have a distinct impact on the resources required for higher education in the future, and librarians should be taking an active interest in the broadened reach of the network.

Librarians want availability of the system for independent, unaffiliated users, whether for research, education, or business purposes.

Right now, if you are not associated with an institution of higher education that is an Internet node, it is complicated and sometimes expensive to get an account on the network. This question resembles that of providing academic library access to unaffiliated scholars; our society is not set up well to deal with people as individuals rather than people as members of institutions. It is certainly easier to deal with institutions, but we must ultimately come around to coping with the question of how to give that community access to the electronic information resources at our disposal, just as we have already determined that public libraries are the way to give them access to print information. Public libraries may continue to be the appropriate mechanism in a networked world as well.

We want to seriously explore the possibility of linking to the NREN governance structure the existing nationwide networks that support the exchange and delivery of information. That means the current regional networks for NSFNET and Internet, but it also means OCLC, RLG, and some of the other information and library-oriented services that have been in place for one or two decades, have established user bases, and provide significant information services to the country.

Turning now to specifics, what will NREN give access to? Considering that the NREN is an evolution of the Internet, we can hazard some reasonable guesses. Electronic mail and computer conferencing are two obvious and early suggestions. These have already changed our lives; the Faxon Institute conference held in April was preceded and followed by a two-month-long computer conference, made available to the speakers and attendees at the conference to share ideas before and after the meeting. The electronic mail capacity of the system is saving time that used to be spent trying to reach people who were never available. Now one just leaves a message in a mailbox, and the addressees respond whenever they can—perhaps at midnight or on weekends—but they do respond. We have not worked out all the bugs; there is no central directory in which one can look up user ID's; it is still difficult to send messages to Europe; and I continue to have trouble with CompuServe—but all in all, electronic mail is a useful facility that changes the very nature of our communication processes.

Another resource already on the Internet is library online catalogs. Librarians rapidly embraced the Internet's capabilities. This seemed like a good idea at the time. It is unclear at this point whether it really is sensible to make individual library catalogs universally available. Let us look at some conditions under which access to online catalogs is useful, and others under which it may be at best misleading. For the faculty member at an institution that has a catalog accessible through

Internet but not in any other dial-up mode, the availability of the catalog online is clearly useful. These catalogs may also be useful *if* you know what you are looking for or *if* you know the strengths of the libraries represented in the Internet. On the other hand, if a researcher is attempting to find a specific item and does not care where it is held, having two hundred individual library catalogs online through one Internet will be only frustrating. In one of the recent online conferences, there was a discussion of the use of online catalogs on the Internet. I could characterize these communications as inconclusive; some are delighted at the availability of all this bibliographic information and are busy teaching students and faculty how to use it, whereas others are certain that a hundred catalogs blooming on the Internet will not be helpful to the researcher.

The availability of researchers' files on the network is of considerable interest. In reality, though, many research-oriented files are, if not copyrighted, at least considered proprietary by their creators. We still do not know very much about the way in which scholars exchange information and under what conditions they are willing to do so. More and more, the products of research efforts are closely held and, less frequently than in the past, shared with the community of scholars—especially if that community's size cannot be predicted because anyone can have access to the network. It will be necessary for some research to be done to identify conditions under which information can be shared versus those conditions under which files are to be held privately. It is clearly within the scope of the library profession's research interest to address this topic in a manner that will have an impact on the world of scholarly communication. Who else can better examine and describe the ways in which people access and use information?

Among the easier conditions to examine, ironically, are the published databases; that is, the databases produced by the private sector that have royalties associated with their use and that we are already using through brokers such as DIALOG and BRS. As the information publishers and brokers become comfortable with the concept of a nationwide network, and as they are able to confirm that they can charge per access, print, or download, they will make their databases available throughout the NREN. All the appropriate business structures are in place; licensing fees have been developed, site licenses exist, and the private sector has begun to recognize that access to its information online could be a better deal than they had originally anticipated. Libraries will have to cope with the question of how to charge. Will they subsidize access to these databases? Or when someone wants to access a commercial database, will they have to use special passwords or account numbers so that they can be billed, either at cost or at a subsidized rate?

Noncommercial databases will also be relatively easy to handle. Here, one presumes that data are being made available to the world at large; the database creator neither worries that his ideas will be stolen nor that he will not receive recompense for the use of the data. The issues here are ones of ease of access, including standardization of searching, location of the database in a directory, and related issues that, considering the alternatives, will not be serious impediments.

NETWORK ACCESS COSTS

Some librarians are adamant that if they cannot offer a service without charge, they should not offer it at all. I disagree with this approach for two reasons: (a) it is unrealistic given the way our society interprets the interaction between the public and private sectors, and (b) there is plenty of leeway to allow libraries or their parent institutions to make distinct decisions about subsidizing access to information.

The costs of accessing the network are not at all clear, but my suspicion is that access will not be cheap. We have a wonderful tendency to ignore discussion of costs when we talk about the future network. The Coalition for Networked Information has seven working groups; none of them is treating cost as an issue, at least at this point, although most of the topics addressed by the working groups have direct cost implications.

Thus far, we know that public funds will not pay for the support of the network and that the intention is to move the operation of the network into the private sector. We also know that the NREN will require wiring, equipment, software, and training, among other things, all of which cost money. Where do librarians think the funds will come from to support this? The direct answer to this question is, I believe, that we are *not* thinking about this issue at all yet, but we *should* be.

Libraries, when confronted with whatever set of costs will be associated with NREN, will have to make decisions. Should the library continue to be on the network? If so, who is going to pay for access? Will the costs be passed along to the end-user, or will the library subsidize access? What about access by the user directly from his or her personal computer at home? Will the cost structure be different for home access, causing people to turn more toward the library for access? I cannot answer these questions, and I think librarians as a community can only speculate about them at this time. But we should be lining up our arguments, just as I said earlier that we should assume the most ideal situation and fight for compromises from that extreme rather than beginning with an already negotiated stance.

Let me qualify what I have just said because this position, taken to extremes, can be counterproductive. We need, as a profession, to stand up for the best interest of our users. However, if we are perceived as being unrealistic and unwilling to deal and negotiate, we will be ignored. That happened to a part of the library community last year during the discussion of the Paperwork Reduction Act; I strongly suggest that we do not want to have a similar occurrence in the future.

WHAT NEEDS TO BE DONE

We, as librarians, need to raise our voices. We are being heard, and our representatives in Congress are doing an excellent job; however, I do not think that most of the Senate or the House realize that librarians may have an interest in the NREN. They need to get letters. One very important thing that can be done, both before and after the bill is passed, is for librarians to write their Congressmen, urging passage of the bill, indicating the intense depth of interest in it by the library and education communities, and urging appropriation of funds.

Librarians also need to educate the research community. These are the people who invented BITNET, who have been using networks for file transfers and electronic mail for years. They need to become aware that their communication and computing tool is about to be used by a very different community within the academic setting and by a population outside academia. We need to tell them what is happening and why we are urging wide access to the system, and we need to gain their support.

We have created our own opportunity to raise the awareness of the wider library community, elected officials, and library users. The White House Conference on Library and Information Services will be held July 9-13, 1991. Many state conferences have sent forward recommendations that the government support the NREN and particularly the educational role of NREN. The delegates to the White House Conference have the opportunity of ensuring that NREN emerges as one of the major recommendations for support and as a target of opportunity for our society in the coming decade.

LEADERSHIP

Can librarians be leaders in the implementation of the NREN? It is not farfetched to assume that librarians, and particularly academic librarians, can and should push themselves forward to participate as equals with researchers and computer scientists. First, we already have

the Coalition for Networked Information. Librarians are nominally an equal partner within the three participating groups, two of which are computer professionals. In fact the majority of the attendance at meetings, and the active participation, comes from the library sector. This must continue. Second, we must remember that it is all well and good to link computers by laying fiber and using communications technologies, but people must perceive a *need* to send information back and forth, and it must be more than electronic mail to justify the great expense that is foreseen by the NREN. What happens on university campuses? The engineers and scientists implement a campuswide network without a good idea of what will flow over the lines. One of the first resources widely used is the library catalog and other library-related information databases.

So librarians *are* already *among* the leaders, and we can lead in some very specific areas. In part, this issue is a problem of the public stereotype of librarians. Nonlibrarians are surprised to find that the library community not only knows about computers and information technology but has also been on the cutting edge of the development of these technological applications. This is a wonderful opportunity to address the stereotype and to show others that librarians do more than check out books.

Most important, however, are the issues of service and information delivery. Librarians understand how to organize information and how people use, seek, and acquire information. They also understand the kinds of problems and issues they run into in the process. If the library had invented BITNET, do you suppose that there would be no directory of user names or of available resources? The documentation for use of the system would be far more adequate for the purpose. (I say this with apologies because BITNET is a wonderful tool, but it does have its drawbacks.) Librarians must step forward to assume the role of service provider and information disseminator for networked information, just as we have been able to do for information in print. In individual cases, on individual campuses, this may well represent a strong partnership between the library and the computer center. In a public environment, it is likely to be the library alone. Nonetheless, people will need help in order to find what they need, and the library profession is the appropriate group to help.

Librarians will be leaders, and we will be able to play a significant role in the way that information is brought to all levels of education and need throughout this country. Self-confidence, and assuredness that we are capable of having this kind of impact, is the foundation of all that is needed.

REFERENCE

Likins, P. (1991, March). Information highways: Who pays? Paper presented at the EDUCOM National NET'91 Conference. Washington, DC.