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Special Librarians and the Internet: A Descriptive Study

INTRODUCTION

In the summer of 1991, we conducted an exploratory study of special librarians who had access to extraorganizational electronic networks such as BITNET or the Internet to determine their use of these networks. (We are using the term *Internet* in a broad sense to include other networks that transfer electronic mail with the Internet. While our respondents used the Internet, BITNET, CompuServe, and MCImail, the majority by far used the Internet and BITNET. It should be noted, however, that certain functions, such as remote login (Telnet) and File Transfer Protocol are only available on the Internet and not on BITNET, CompuServe, and MCImail.) We asked special librarians to tell us how they used these networks and what value they received from this use. We also asked them how they became aware of the existence of the Internet and how they learned how to use it. Papers based on this research have appeared in a variety of sources (Ladner & Tillman, 1992a, 1992b, 1992c, 1993a; Tillman & Ladner, 1992, in press) and form the basis for a book published by the Special Libraries Association (SLA) (Ladner & Tillman, 1993b).

Our purpose in conducting research on special librarians is to find out how and for what purposes a group of information professionals who are themselves specialists in the retrieval, organization, and dissemination of information use the Internet. Most of the articles appearing in the library literature on the Internet have been written by academic librarians or computer systems professionals. Special librarians, whether in the one-professional environment, as managers of larger industrial libraries, or as academic subject specialists, are more often in public services positions, and they may use the Internet differently from their colleagues in academe.

Even though our 1991 data did not indicate differences in the use of the Internet between special librarians in and outside of academe, because only

35% of the 54 respondents we surveyed in 1991 were nonacademic special librarians, we felt it was important to expand our study to include more nonacademic special librarians. In the fall of 1992, therefore, we surveyed an additional 27 special librarians who worked in nonacademic libraries or information centers.

This paper, then, is an analysis of the data we collected on special librarians in 1991 and 1992 to determine if special librarians working in colleges and universities differ from special librarians in corporations, not-for-profit organizations, and government agencies. In this paper, we will focus on comparing the academic and nonacademic use of the Internet and training issues. Specifically, we will describe:

- how special librarians learn about the Internet;
- how special librarians access and pay for the Internet;
- how special librarians are trained, gain employer support, and provide training;
- how special librarians use the Internet; and
- how training needs are expressed by special librarians.

CHARACTERISTICS OF SPECIAL LIBRARIANSHIP

In this study, we define special librarianship as library and/or information service geared to meet the needs of specialized users or specialized situations. Special librarianship is independent of organizational structure: special librarians work in "information organizations sponsored by private companies, government agencies, not-for-profit organizations, or professional associations" as well as in "specialty units in public and academic libraries" (Mount, 1991, p. 2). Our research focuses on the individual, not the organization, and includes special librarians working in not-for-profit organizations, for-profit corporations, and governmental agencies, as well as academic institutions.

Special libraries in industry differ from those in academe. Industrial libraries tend to be smaller than academic libraries, sharing many of the characteristics of small libraries, such as small staff and limited time spent in technical services functions like original cataloging (Hill, 1985). Industrial libraries have more specialized collections than academic libraries, and even though small, within their specialty these collections are also more comprehensive, often including obscure journals and grey literature such as pamphlets, preprints, and technical reports (Mount, 1985). They also have different security requirements because of the existence of confidential or proprietary materials in their collections.

Special libraries in the private sector are more economically driven than academic or public libraries. Because they are part of a larger organization, managers of these special libraries must justify major expenditures, including capital projects, to a management that often does not understand library operations and needs (Ladner, 1990; Hill, 1985).

Many special librarians in science or technology fields work closely with researchers who have been using Internet precursors such as ARPANET, NSFNET, and MILNET for years. In some cases, these librarians are serving

as intermediaries between the network and the end-users to access the network. Stern (1988) describes the use of BITNET by physics, astronomy, and math librarians for electronic mail (e-mail) functions such as obtaining hard-to-find conference proceedings. This informal use of BITNET by members of the SLA Physics-Astronomy-Mathematics Division evolved into the BITNET listserv forum, SLA-PAM@UKCC (Tillman, 1991). In other cases, however, researchers may be using the networks independently of the library and are unaware that their librarians are network users as well.

RESEARCH DESIGN

Because this is an exploratory study of Internet use by special librarians, we employ a qualitative approach to our research. Qualitative researchers strive to understand phenomena and situations as a whole without imposing preexisting expectations on the research setting (Patton, 1980). Hiltz and Turoff (1978) stress the need for a holistic approach in studying the impact of computer conferencing systems; the unanticipated consequences of a new technology are often more important in the long run than the testing of explicit hypotheses. We have tried to approach our investigation of how special librarians use the Internet and what it means to them with a similar lack of preconceived ideas and expectations. We have also used the Internet to collect our data electronically.

Several researchers have compared electronic forms of data collection with other methods for both quantitative and qualitative applications. Electronic surveys are easy to administer to people who are linked by a computer network. The network can locate respondents automatically through distribution lists, deliver the questionnaire to remote locations, and permit respondents to answer questions at their own convenience (Hiltz & Turoff, 1978).

Kiesler and Sproull (1986) found that responses to open-ended questions that could be edited on the computer were more than twice as long as those received from participants using a conventional mail survey. Electronic surveys also had a faster turnaround time and fewer item incompletions. Sproull (1986) determined that e-mail "produced adequate data, response rates, and willingness for further participation, with little expenditure of researcher time or effort and a high degree of convenience for respondents" (p. 167) and for these reasons recommends its use in organizational research.

In both our 1991 and 1992 surveys, we used the Internet as a tool to locate special librarians to participate in this study as well as to administer the survey instrument and collect data.

1991 Survey

Participants were solicited through Call for Participation announcements posted on nine computer conferences (also called listservs or forums) in July 1991. The computer forums, all library-related, were chosen because of their interest to special librarians in various subject specialties. A similar announcement was also placed in the August issue of *SpecialList*, the monthly newsletter of the SLA, in order to obtain participants who may be users of the Internet

but not active on computer forums. We sent a five-page electronic questionnaire to the 113 librarians who responded to this initial announcement; the 54 special librarians who responded to this second survey comprise the 1991 sample.

In the Call for Participation announcement, we included a brief questionnaire that potential respondents were asked to return, either electronically, via fax, or regular mail. Here we asked respondents to list the computer conferences to which they subscribed, the length of time they had been using either BITNET or the Internet, and to "Briefly describe (in a paragraph or less) your use (and/or your patrons' use) of BITNET or the Internet." On the five-page questionnaire, we asked a series of structured questions to find out how and for what purposes our respondents used BITNET or the Internet so that we could flesh out the information we had already received through the preliminary survey. We also included a series of questions about training and costs involved in accessing these systems.

To determine the importance and value of BITNET or the Internet to their work and for special librarians in general, we asked respondents to describe, based on their experience, "the major advantage or opportunity for special librarians in using BITNET/Internet"; "the major disadvantage or barrier for special librarians in using BITNET/Internet"; their "most interesting or memorable experience on BITNET or Internet"; and finally, we asked them for "any other comments [they'd] like to make about the use of BITNET or Internet by special librarians."

1992 Survey

Recognizing that the majority of our 1991 respondents were academic special librarians, we attempted to address this potential bias by selecting only nonacademic special librarians in 1992. We identified nonacademic special librarians through multiple venues. We recruited participants who attended programs on the Internet at the SLA Annual Conference in San Francisco in June 1992, as well as attendees at other conferences attracting special librarians. We also solicited respondents from Internet computer forums of interest to special librarians by sending surveys directly to list subscribers whom we tentatively identified as nonacademic librarians. Finally, we sent e-mail letters to special librarians who had posted messages on other listservs to which we subscribe, asking the poster to participate in our study.

A total of 27 nonacademic special librarians completed the 1992 questionnaire. These 27 respondents plus the 54 special librarians who were surveyed in 1991 are the focus of our study.

In 1992, we combined the questions found in the 1991 preliminary and five-page follow-up questionnaires into one survey instrument. This questionnaire contained 22 questions that were identical to those found on the 1991 questionnaires, plus several new questions dealing with how the Internet is accessed and a series of questions concerning frequency of use by function. Respondents to the 1992 survey were also asked to indicate the importance

of five Internet functions (e-mail, Telnet, discussion lists, file transfer, and chat/talk) based on a five-point scale. All results reported in this paper are rounded to the nearest whole number.

Survey Participants

Forty-three percent of the special librarians who participated in this study work in academic institutions; 24% work in for-profit corporations, 15% in not-for-profit organizations, 14% in government or public agencies; and 5% are information specialists who do not work in libraries. Participants represent a wide range of administrative levels: 44% of the academic librarians and 39% of the nonacademic respondents are in management (library directors, assistant directors, or branch or department heads); 56% of the academic and 50% of the nonacademic respondents are librarians, information specialists, or subject specialists (e.g., business librarian, math librarian, or science librarian). Survey respondents from the most technologically advanced institutions to smaller colleges and universities outside the urban, technological mainstream are represented; 94% of respondents are located in the United States. The majority of respondents work in sci-tech disciplines.

Study participants cannot be considered to be representative of special librarians as a whole, mainly because access to the Internet is so heavily skewed toward academic and sci-tech organizations. Although sci-tech and business comprise the two largest subject categories of special libraries (Ladner, 1992), only 7% of the respondents in this study are business librarians. We did not, however, intend our sample to be representative of special librarians as a whole. The purpose of this study is not to generalize our findings to a larger group but to investigate the ways in which a subset of special librarians who are "early adopters" (Rogers, 1986) use the Internet. These librarians can serve as role models for those to come.

FINDINGS

Learning about the Internet

Professional literature and informal contacts were responsible for many respondents learning about the Internet. One difference between 1991 and 1992 has been the availability of programs offered by professional associations, commercial vendors, and individuals (e.g., the very successful series of self-paced exercises offered via the Internet by Richard Smith, of the University of Southwestern Louisiana, that saw enrollment of 800 when first offered and 15,000 the second time). More of the 1992 respondents, in particular recent subscribers, credited conferences and regional or local workshops than the 1991 respondents. We believe that this finding is solely a function of the different time period. In the words of one 1992 respondent, "Internet is a hot conference topic." Therefore, no conclusions can be drawn concerning the higher mention of programs for nonacademics than academics.

One corporate librarian's description of how she learned is echoed by several other respondents as well. She did not see its relevance to her needs at first:

I heard about it (Internet) at an SLA annual conference two years ago, in a casual discussion with an academic librarian. I might add that she seemed genuinely shocked that I, or any librarian, would not be on the Internet. When I asked why I should be . . . she never really came up with an answer. My own conclusion at the time was that I needed to get access to it just so I wouldn't feel so inadequate the next time I ran into the same type of situation. I have since come to realize that there are better reasons for using the Internet, but I had to do most of the discovery and learning on my own, with precious little time for it given my day-to-day workload.

On the other hand, a very different attitude is also evident by the response of another corporate librarian, who joined as soon as he realized he could. The loosening of the restrictions in the National Science Foundation Acceptable Use Policy is an important factor in the acceptance of the Internet for the special library community (Tillman & Ladner, in press).

Access and Cost

We asked survey respondents whether the library/department or the parent organization paid for access to the Internet and how this compared to the expense for internal e-mail. Slightly more than half of respondents had the cost of both internal e-mail and Internet access paid for by their parent organizations, and about 20% did not know who covered these costs. Only 9% said their library or department was charged for Internet access. There are no differences between academic and nonacademic respondents in how they pay for access to the Internet or internal e-mail.

We also asked our 1992 respondents (all nonacademic special librarians) how they accessed the Internet. About 90% of the special librarians surveyed in 1992 access the Internet through their own organizations. Of these, the majority access the Internet through their organization's own Internet connection. Others report that their organization provides access to the Internet through a university connection or other outside service. Outside sources for Internet access mentioned by respondents include, in addition to universities, a health sciences library consortium, The WELL, Cleveland Free-Net, MCI mail, and CLASS. An analysis of cost and access for 1992 respondents reveals that 3 of the 10 respondents who access the Internet through outside sources, rather than through their own organization's Internet connection, pay for this access from departmental funds. By comparison, none of the 14 respondents whose organization provides Internet access have this cost charged back to their departments.

Training and Employer Support

We provided respondents with a list of training methods and asked them to check off all that were applicable. While 63% of the respondents taught themselves, 52% learned informally from a colleague or friend. Formal training from a single one-hour class to a more structured learning experience was mentioned by 35%. That none of them learned in library school could easily be a function of when the respondents attended library school; the Internet

is relatively new to library school curricula. Only 30% of nonacademic librarians checked that they had attended a class or other formal training, as compared to over 43% of academic librarians. In general, respondents indicated they were responsible for their own training (25% indicated they read manuals or other guides); this did not vary by time on the net or by type of library.

Interestingly, a growing number of training tools are now available that appeared around the time of our survey but not early enough that survey respondents had time to make use of them. Future respondents are likely to mention the wealth of published print materials, including Krol's (1992) *The Whole Internet: User's Guide and Catalog* and LaQuey and Ryer's (1993) *Internet Companion*.

Both academic and nonacademic respondents described similar types of training that they provide to others in their organizations. Primarily informal, this training includes helping clients learn how to send mail to someone outside the company, creating short handouts or "cheatsheets," archiving and distributing documentation on the Internet, and one-on-one instruction. More formal training was described in terms of providing training to staff and teaching employees to learn to use the various online public access computers (OPACs) available. One respondent commented that recently a librarian had been hired with specific responsibility to teach and help clients use the Internet/BITNET. Interestingly, two of the 1992 respondents described external training ventures in which they offered networking instruction to people outside their own organizations. The question that asked respondents to describe the support provided by their employers elicited comments ranging from minimal to strong encouragement and financial backing, with little differentiation between academic and nonacademic librarians. The issue of lack of time was commonly mentioned. This problem was succinctly expressed by a corporate research and development librarian, who wrote: "Employer is supportive. I don't have time."

Extent and Frequency of Use

Half of the respondents had been using the Internet or its precursors for less than 18 months. More of the nonacademic special librarians were new users of the Internet, compared to those in academe; almost half (44%) had been using the Internet for 12 months or less, compared to 32% of the academic librarians. Our least experienced Internet user signed on to the network just one month before completing the questionnaire. Our most experienced respondent, by contrast, had been using Internet-type networks since 1969 and was involved with ARPANET since it began at Stanford.

A surprisingly large number of respondents (27%) had been using the Internet for more than three years at the time they were surveyed. This is prior to the appearance of most of the articles in the library literature on the Internet. There was virtually no difference between academic librarians (29%) and nonacademic librarians (26%) among these long-time Internet users. The finding that so many of our respondents have been using the Internet for at least two years demonstrates that they can be considered early adopters (Rogers, 1986) of this communications technology. Some characteristics of early adopters, according to Rogers, are higher socioeconomic status, more active seeking of information about technological innovations, and eclectic interests.

Another indicator of experience with electronic networking is the amount of time spent each week on interactive communications technologies. We

computed two such measures: number of hours spent each week on the Internet and hours spent per week on e-mail within the organization. These findings are displayed in Table 1.

TABLE 1
ELECTRONIC NETWORKING PATTERNS BY LIBRARY TYPE

<i>Item</i>	<i>Academic (%)</i>	<i>Nonacademic (%)</i>	<i>Total (%)</i>
(number of respondents)	(35)	(46)	(81)
Time Spent on BITNET/Internet			
5 or more hours/week	25.7	28.3	27.2
2.0-4.9 hours/week	57.1	43.5	49.4
1.0-1.9 hours/week	14.3	26.1	21.0
Less than 1 hour/week	2.9	2.2	2.5
Mean*	4.4	3.9	4.1
Median	3.0	2.0	2.5
Length of Time on Internet at Time of Survey (months)			
Mean**	32.9	27.1	29.6
Median	24.0	17.0	18.0

* $t = 0.53$; $p = .597$. Mean and median based on respondents who use internal e-mail (29 academic, 45 nonacademic); $t = -1.36$, $p = .179$.

** $t = 1.02$, $p = .311$.

About half of our respondents spend between 2 and 5 hours each week on the Internet. Frequency of use ranged from less than one hour each week (one respondent) to 15 hours a week on the network (three people). Academic and nonacademic respondents did not differ in their frequency of Internet use. This distribution of Internet use that we observed in these special librarians is similar to those reported by Rogers (1986, p. 125) in his studies of the patterns of use of new communications technologies, where a small percentage of users accounts for a large percentage of use. In our study, 10% of the users accounted for 46% of the total use, measured in hours per week. Table 2 breaks down frequency of use by type of use for the nonacademic special librarians surveyed in 1992. E-mail is by far the most common function, used by all but one respondent. By contrast, FTP is the least used Internet utility: 11 of the 21 who reported they have access to FTP have never used it.

How the Internet Is Used

This section describes how the special librarians we surveyed actually use the Internet and the importance they attach to five Internet functions: e-mail, discussion lists, Telnet, FTP, and Internet Relay Chat (chat/talk).

We organized responses to our unprompted Internet use question—"Briefly describe your use of the Internet or BITNET"—into six umbrella categories based on the constant comparative method (Mellon, 1990). Listed below are the functions and tasks included under each of these Internet use categories:

Internet Use Categories

Work-related communication, e-mail:

- Communicating with colleagues outside the organization
- Communicating with colleagues and patrons within the organization
- Providing electronic reference service to patrons
- Requesting/providing electronic reference to/from other librarians
- Receiving patron requests for new books, journals, media, ILLs
- Requesting/providing ILLs to other libraries
- Requesting/providing missing issues, duplicates exchange
- Conducting professional association business, committee work, program planning
- Conducting consortium business
- Providing/receiving technical assistance to/from other e-mail users
- Requesting/ordering library materials, documents
- Identifying document sources
- Getting quick copyright permission
- Exchanging management and other work-related information
- Submitting applications for employment
- Communicating with vendors/customers
- Delivering search results from vendor to corporate e-mail

Discussion lists, bulletin boards, e-journals:

- Monitoring/participating in newsgroups, BBS, and computer forums
- Accessing electronic journals and newsletters
- Obtaining information on courses, conferences, scholarships, jobs
- Participating in subject-specific lists
- Serving as list owner/moderator
- Subscribing to electronic publications

Searching remote databases:

- Searching remote library catalogs and union lists
- Searching online systems, e.g., RLIN, LEXIS, EPIC, MEDLINE
- Scanning journal tables of contents, e.g., BIOSCI, UnCover
- Searching non-OPAC databases outside organization
- Searching databases on mainframes within organization
- Accessing campus computer systems
- Obtaining cataloging information

File transfer, data exchange:

- Retrieving files via FTP, e.g., getting RFCs
- Receiving documents, technical data
- Sending files, e.g., search results, acquisitions lists, articles, technical data
- Creating mailing/distribution lists for sending files

Research and publication:

- Collaborating in research efforts, coauthoring papers
- Contacting editors and publishers
- Writing dissertation, articles for publication
- Working on Project Gutenberg

Engaging in electronic publishing
 Submitting drafts of papers for feedback and comment
 Engaging in business research and development

Personal communication, leisure activities:

Engaging in non-business-related communication with friends, relatives, and spouses
 Contacting children in college
 Playing games

Other uses:

Training others in Internet use
 Demonstrating Internet functions to others
 Maintaining organization's client/server
 Getting Internet access for patrons, clients
 Using Internet for technical services support

TABLE 2
 FREQUENCY OF INTERNET USE BY FUNCTION
 (n = 27)*

<i>Function**</i>	<i>Percent</i>
Have access to e-mail on Internet?	100.0
Time spent on e-mail	
5 or more hours/week	7.4
2.0-4.9 hours/week	18.5
1.0-1.9 hours/week	25.9
less than 1 hour/week	44.4
never/don't use	3.7
Have access to Telnet?	85.2
Time spent on Telnet activity	
5 or more hours/week	0.0
2.0-4.9 hours/week	13.0
1.0-1.9 hours/week	21.7
less than 1 hour/week	43.5
never/don't use	21.7
Have access to FTP?	84.0
Time spent in FTP activity	
5 or more hours/week	0.0
2.0-4.9 hours/week	4.5
1.0-1.9 hours/week	13.6
less than 1 hour/week	31.8
never/don't use	50.0
Have access to computer lists?	82.6
Time spent on lists	
5 or more hours/week	5.3
2.0-4.9 hours/week	15.8
1.0-1.9 hours/week	42.1
less than 1 hour/week	21.1
never/don't use	15.8

*Nonacademic special librarians surveyed in 1992.

**Frequencies are based on number of respondents who have access to the function, not the total number of respondents.

Table 3 shows percentages of academic and nonacademic survey respondents who described or provided examples of Internet use based on the categories we developed. These percentages are not rates of use by function because we did not directly ask respondents if they used features like e-mail, Telnet, FTP, etc. Since these percentages are based on unprompted responses to a general question about use, we suspect that actual rates for specific Internet functions are higher. Responses to unprompted questions like the above can be used to indicate relative importance of system features, since respondents are more likely to list those features that are most important or valuable to them. Caution, however, should be used in detecting trends in Internet use based on the percentages displayed in Table 3. For one thing, academic respondents do not differ statistically from nonacademic respondents in any of the listed categories. One factor, however, that needs to be considered is that all of the academic library respondents were surveyed in 1991—before the appearance of user-friendly front-ends like Gopher, which simplifies the process of searching remote systems through Telnet, and Veronica, a powerful searching tool.

TABLE 3
INTERNET USE BY LIBRARY TYPE*

<i>Category</i>	<i>Academic (%)</i>	<i>Nonacademic (%)</i>	<i>Total (%)</i>
(number of respondents)	(35)	(46)	(81)
Work-related communication, e-mail	91.4	87.0	88.9
Electronic forums, bulletin boards, e-journals	65.7	54.3	59.3
Searching remote databases (Telnet)	34.3	43.5	39.5
FTP and other file transfer	34.3	23.9	28.4
Research and publication	25.7	10.9	17.3
Personal communication, leisure activities	8.6	8.7	8.6
Other	2.9	8.7	6.2

*Source: content analysis of survey question, "Briefly describe your use of the Internet or BITNET." Difference of proportions in dichotomies were evaluated with z-scores (Blalock, 1972).

What the data in Table 3 do show is the overwhelming use of the Internet for e-mail by survey respondents. We first observed the importance of e-mail to the special librarians we surveyed in 1991, the majority of whom were academic librarians. These special librarians use the Internet primarily for communication—with each other, with other librarians, and with their clientele (Ladner & Tillman, 1992a, 1992b, 1992c; 1993b). Increasing the number of nonacademic special librarians in our study does not alter this finding.

In 1992, we asked respondents to indicate the importance of five Internet functions (e-mail, Telnet, discussion lists, file transfer, and chat/talk) based on a five-point scale. The results of this analysis show that e-mail ranks first, followed by Telnet and discussion lists. Three out of four consider e-mail to be essential or important in their work, and two out of three consider Telnet to be essential

or important. In comparison, less than half consider discussion lists to be essential or important, and only one out of four feel that way about FTP.

Training Needs

While a few questioned the need for any instruction, most respondents assigned responsibility for training to multiple bases: parent organizations (by both libraries and computer centers), professional associations, library schools, and commercial trainers. Instructional tools desired included manuals, print documentation, tutorials, video, and demonstration disks. Respondents repeatedly expressed their need for easy-to-use packaged information.

Both academic and nonacademic librarians viewed their own organization as prime sites providing facilities, written materials, and staff to conduct workshops. They felt that organizations should offer basic training in FTP, Telnet, e-mail, and USENET news. Respondents in larger organizations described the viability of subdividing the training within the parent organization, with the computing center offering classes on the basics of the Internet and the library offering seminars on available network resources in specialized subject areas.

An academic law librarian also mentioned the need for informal mentor training, providing help when it is needed. Half of the librarians surveyed, in fact, had checked informal training as one of the ways they had been trained to use the Internet. Others cited family members as also playing a role in their training. Several librarians cited the Internet itself as a way they received their training by asking questions of their colleagues or others via the net or by finding online documentation.

Both academic and nonacademic librarians urged library schools to be in the forefront in educating students about the Internet. Library schools should provide accounts to students and probably require at least a minimum amount of usage. Library schools should also offer classes in network access, including not only basic training, but theory, and some information on how the network can be helpful to librarians. Some respondents cautioned library schools against making their Internet instruction too specific or procedural because the technology changes too quickly and varies among institutions and disciplines. One special librarian, using the Internet to facilitate work on her Ph.D. dissertation, felt strongly that the skill "should be expected of library school students (and faculty) and not specifically taught as part of that program for credit."

Respondents said that the role for professional associations is particularly important for experienced librarians and for librarian-specific applications, especially in providing a setting where experienced librarians who did not learn network use in library school could obtain an introduction and hands-on training without embarrassment at "not knowing." A science librarian in a government agency advocated that professional organizations demonstrate their support by adding e-mail addresses to directories. Professional organizations should be providing exposure to what is on the Internet, but they, like library schools, cannot replace the parent organization's local training on how to use that organization's specific system.

The most interesting difference between 1991 and 1992 survey responses was the identification of new sources for trainers. Several respondents surveyed in 1992 reported that their OCLC-affiliated library consortia are getting into the arena of Internet access and training. One librarian saw a role for public libraries to offer classes for the public, because as the network grows and more and more people have access, the bigger the gap will be between those who can afford access, or who have it through their jobs, and those who cannot afford access.

What Training Should be Provided?

In answer to our question on what training should be provided for new users, respondents identified very specific knowledge that should be imparted in the training. The need for coverage of both theory and basic training techniques was frequently mentioned. Training should cover both history and philosophy of the Internet along with what it is, what's out there, and how it works. Useful training sessions would include training in FTP, Telnet, e-mail, USENET news, listservs, addressing algorithms, proper etiquette (netiquette), security rules to safeguard computers/data, how to connect to the Internet, how to keep up with Internet developments and changing resources, how to manage the flow of information, and how this differs and/or complements for-fee online services.

Respondents also mentioned training needs specific to librarians, for example: how networking is helpful to librarians and its potential for libraries, how to identify information nodes to locate and access relevant forums and publishers, how to make the best use of increased connectivity to streamline library procedures, and how to persuade important vendors to provide e-mail access of electronic data interchange (EDI). Respondents to the 1992 survey added the need to cover specific Internet tools, such as Wide Area Information Servers (WAIS) and archie, which were not mentioned in comments of 1991 respondents.

Survey respondents considered that the end result of training should be to impart sufficient knowledge of what is on the Internet and how to use it in order to integrate Internet resources into organizational needs, information technology expertise, and a high comfort level with continuing change. Their responses to our series of questions about how they were trained and training needs of special librarians can be grouped into the following questions:

1. What is the Internet (or more broadly, electronic networking)?
2. Why should I be interested in it? (In particular, what's in it for me and my company? What is out there that will add value to my performance?)
3. How do I get connected? (How do I arrange for access? How do I log on?)
4. What do I need to learn to get started?
5. How do I build my competence and keep up to date?
6. What's coming in the future?

IMPLICATIONS AND CHALLENGES

Our findings indicate that there are no real differences between the way that academic and nonacademic special librarians use the Internet. Responses from the 27 additional nonacademic special librarians we surveyed in 1992 mirror and reinforce those of 1991 respondents and are independent of organizational type.

Training and Trainers

Our analysis of how special librarians learned to use the Internet provides some answers but also raises additional questions. Where are library schools in the training continuum? There was a plethora of training sessions described by the 1992 respondents, but none sponsored by library schools. Respondents, particularly those with less than a year's Internet experience, expressed the need to know more. Their reaction to the quality of training was mixed; some respondents expressed satisfaction, others dissatisfaction with the training they received.

Those surveyed presented specific recommendations to improve present training. How will their expressed needs be addressed? Will Internet training continue to be met by the same providers that respondents mentioned? Most likely not. The introduction of textbooks and commercial trainers brings an added dimension to Internet training that will most likely expand in the future. It will be interesting to observe what types of training will be best addressed by commercial providers. In addition, the widening access to the Internet beyond the research and educational community to the public at large will mean a continued expansion in the need for training for new users. Librarians from all types of organizations can play an important role in this area in the future.

Access

The academic and nonacademic special librarians in our study access the Internet through different means. Generally respondents who access the Internet through consortia or from accounts with external providers are nonacademics, and this type of access may be charged back to the library or department. Having to pay for Internet access from departmental funds requires that special librarians justify its use in order to fund the line, whereas special librarians whose organizations provide access do not have this problem.

The growing number of Internet access providers in the marketplace may herald greater opportunities for nonacademic special librarians to gain access to the Internet at a reasonable price. The addition of some OCLC regional networks offering individual accounts to their members may be of particular value to some smaller libraries because the Internet access fee can be folded into a budget line that already exists for cataloging. Also, the growing market of Internet providers offering user accounts empowers the small or one-person library that may never have been able to justify the need for an Internet node.

Types of Use

The special librarians we surveyed use the Internet to communicate—with each other, with their clientele, with outside experts, with other librarians, and with other professionals they happen to meet on the network. They spend more time in e-mail-related activities, and three out of four consider e-mail essential or important to their work.

We anticipate, however, that relative use may shift away from e-mail as a result of Gopher and WAIS and their successors that make use of Telnet and FTP within a more user-friendly interface. More of the respondents surveyed in 1992 considered Telnet to be important or essential to their work than they did discussion lists. This is not to say that e-mail will diminish in importance, but we predict that Telnet and FTP will increase in use over the next few years.

We observed that respondents surveyed in 1992 rank Telnet higher than discussion lists, second only to e-mail. By comparison, although we did not ask respondents in 1991 to rate Internet functions as to importance, we did find that there were fewer unprompted descriptions of Internet use for remote database searching than for discussion lists among this group. There is the very real possibility that special librarians outside of academe may find the discussion lists too oriented to academic librarianship and consequently less relevant to their needs. The emergence of specific lists relevant to special librarianship may offset this possibility.

As the number of discussion list subscribers increases, will these lists' value as an interactive, human-based source of information decrease? Price (1963, pp. 62-91) postulated 30 years ago, in his essay on the nature of invisible colleges, that it is possible to keep up with a colleague group no larger than a few hundred members; once this size is exceeded, it becomes impossible to monitor the subject area. Will the same hold true for discussion groups, which seem to serve the function of electronic invisible colleges? Will more experienced users drop out of discussion groups, frustrated with seeing the same questions asked over and over again by novice users? Or will the group move from the openness of small lists to become managed by a "moderator" who will handle the messages sent in error to the group as well as inappropriate comments? Or will software enable better management of mail received?

Current Users

The majority of special librarians we surveyed work in scientific, technical, and medical disciplines. Special librarians in other fields, such as business, may use the Internet differently. Ladner (1992) found that more sci-tech than business special librarians are members of resource-sharing networks and use them more frequently. Will a similar pattern be observed for business librarians with the Internet? Our respondents can also be considered early adopters of Internet technology, and as such, may not use the Internet in the same way as special librarians who come on board later.

While this research does not provide a definitive picture of the special librarian on the Internet, we have in this exploratory study created a composite role model for the many special librarians looking for guidance in what the

Internet can do for them. Our research encompasses a wealth of data that is richly descriptive but exploratory. These data must be viewed in the context in which they were collected—we surveyed special librarians who responded to a Call for Participation in a research project—and cannot be generalized to special librarians as a whole. Our findings raise questions that beg to be answered through additional research on other Internet users.

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